Graduate Wildlife, Sustainability, and Ecosystem Sciences Courses

WSES 5084. Professional Practice. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).
This supervised professional practice will involve the student in practical activities in the agricultural or natural resource sciences. The experience is tailored to the to the student's interests, and academic and career goals. Experience may include teaching, independent research, internship, or other applied learning experience. May be repeated once for credit. Prerequisite: Graduate standing.

WSES 5085. Seminar. 1-3 Credit Hours (Lecture: 1-3 Hours, Lab: 0 Hours).
A graduate seminar with content varying according to the needs and experiences of students and the instructor of record. May be repeated as content varies. Prerequisites: Graduate standing.

WSES 5086. Problems in Natural Resource Sciences. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).
Advanced studies in wildlife, sustainability, ecosystem sciences, and the natural resources. Problems assigned according to experience, interest, and needs of the individual student. May be repeated for credit as topics vary.

WSES 5087. Research. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).
Graduate students conduct original research on a variety of topics in the natural resource sciences toward a graduate thesis. Designed for students who will be conducting field research away from the Stephenville campus. Course will be graded as satisfactory or unsatisfactory. Prerequisites: Graduate standing, with a major in MS-ANRS; permission of the instructor.

WSES 5088. Thesis. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 1-6 Hours).
Scheduled when the student is ready to begin the thesis. No credit until the thesis is completed. Prerequisites: Approved research methodology course and approval of instructor of record.

WSES 5090. Special Topics in the Natural Resource Sciences. 1-6 Credit Hours (Lecture: 1-6 Hours, Lab: 0 Hours).
Selected topics in wildlife, sustainability, ecosystem science, or the natural resources as needed and dependent upon department, faculty, and student interests. May be repeated as topics vary. Prerequisite: Approval of the instructor.

WSES 5301. Principles of Research in the Natural Resource Sciences. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
This course is a thorough treatment of the philosophy of science as it applies to the ecological, environmental, and natural resource sciences. Starting from the historical foundations of science, students will become familiar with the logical underpinnings of ecological research, including epistemology, the nature of theory, hypothesis testing, and the logic of study design. This course will provide students with a logical understanding of the scientific process, prior to enrollment in more quantitative treatments of study design and data analysis. Students will be required to prepare a complete research proposal in the course. Credit will not be awarded for both ANRS 6301 and WSES 5301. Prerequisite: graduate classification.

WSES 5302. Natural Resource Ecology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Advanced relationships of ecological principles to natural resource, wildlife, and range conservation and management. Ecology's historical context; evolution; the niche; intraspecific and interspecific competition; vegetation succession; predator-prey dynamics; and spatial ecology. Credit will not be awarded for both ANRS 6302 and WSES 5302. Prerequisites: Graduate standing with a major in MS-ANRS or MS-BIOL; and successful completion of a general ecology course.

WSES 5303. Graduate Field Studies in Ecology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Students explore various facets of ecology during extended field trips to various locations in Texas and the other United States. Topics may vary depending upon location. May be repeated for credit when topics vary. This course requires an extended field trip at the student’s expense (in addition to the field experience fee). Prerequisite: graduate classification, and enrollment by permit only and with approval of the instructor.

WSES 5304. Wildlife-Habitat Relationships. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
An advanced study of habitat and wildlife-habitat interactions. This is a graduate level class for individuals with a basic understanding of ecological and wildlife management concepts. Involves review and discussion of important articles on this subject. Includes advanced discussion of concepts such as plant succession, niche, carrying capacity, habitat measurements, and habitat management. Students will learn how habitat and succession may be manipulated to best manage wildlife populations; also how browsers and grazers may affect their habitats. Credit will not be awarded for both ANRS 6304 and WSES 5304. Prerequisites: Graduate standing with a major in ANRS-MS or BIOL-MS and the successful completion of a course in general ecology.

WSES 5305. Cross-cultural Natural Resource Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Designed to expand the student’s understanding of natural resource management in cross-cultural settings. Prepare students in social science, agricultural, environmental, or wildlife management for careers or assignments in and outside the USA that require multi-cultural understanding. Facilitate the student’s adaptation of management skills and knowledge in diverse natural, legal and cultural settings. Content and assignments are flexible so the student can focus on the natural resource and culture of greatest interest. Prerequisites: Graduate standing.

WSES 5306. Fire Ecology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
This course will address the ecological role of fire in natural systems, rangelands, including grasslands, shrublands, woodlands, and forests; adaptations of plants and animals to fire; long-term controls on wild fire; use of fire as an ecosystem management tool, with aspects of wildland firefighting; and prescribed burning, including fire behavior, fuels, weather, politics and policy. Students will gain hands-on prescribed burning experiences as circumstances and weather permit. Credit will not be awarded both for ANRS 6306 and WSES 5306. Prerequisites: Graduate standing with a major in MS-ANRS, MS-ENVS, or BIOL-MS; and successful completion of a course in general ecology. Lab fee: $2.

WSES 5307. Global Natural Resource Issues. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Exploration of the environmental, political, social, and economic factors affecting the use, management, and protection of natural resources worldwide. Impacts of colonization, migration, international development, globalization, energy use, tourism, climate change, and various political systems on natural resource use and management will be analyzed and debated. On-going class discussions to integrate and contextualize research on international natural resource issues. Prerequisites: Graduate standing.

WSES 5308. Measuring Animal Behavior. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
An advanced course in the principles and methods of quantitative studies of behavior, with an emphasis on techniques of observation, recording, and analysis. Credit will not be awarded for ANRS 6308, ANSC 5308, and WSES 5308.

WSES 5309. Plant-Animal Interactions. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Plant-animal and animal-plant interactions are the basis for many ecosystem functions. This course tailors the study of those interactions to student interests from insects to ungulates, aquatic to terrestrial, managed to natural systems, and individual species to ecosystems. Credit will not be awarded both for ANRS 6309 and WSES 5309. Prerequisites: Graduate standing with a major in MS-ANRS, ANSC-MS, or MS-BIOL, and successful completion of an ecology course.

WSES 5310. Presentation of Scientific Findings. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
This course is designed to teach graduate students in the natural resource sciences and allied fields the principles and practices of presenting the results of scientific research. Course focus will be on preparing and delivering oral research presentations and research posters; and the preparation, submission, and publication of scientific journal articles, technical bulletins, and research reports. Prerequisite: Admission into the Research Track of the MS Program in Agricultural and Natural Resource Sciences and a grade of B or better in BIOL 5380, or approval of the Department Head.

WSES 5311. Ecological Pest Management. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
An advanced study of the principles of integrated pest management emphasizing the ecologically sound use of chemical, biological, cultural, and physical control tactics to manage pests. Students will concentrate on one or few commodities, of their choice, and develop a detailed best management plan. Credit will not be awarded both for ANRS 6311 and WSES 5311. Prerequisites: Graduate standing with a major in MS-ANRS and successful completion of a course in general entomology.

WSES 5313. Vegetation Measurement, Inventory, and Monitoring. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Advanced vegetation sampling, measurement, monitoring, inventory, study design, and quantitative and statistical analysis. Assessment of range condition and forest health based on understanding ecological processes. Hands-on, field-based laboratory. Credit will not be awarded both for ANRS 6313 and WSES 5313. Prerequisites: Graduate standing with a major in ANRS-MS or BIOL-MS; and successful completion of a course in statistics, and a course in plant identification.

WSES 5314. Veterinary Entomology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Advanced studies in the classification, biology, and management of arthropods associated with livestock and wildlife systems. Emphasis will be placed on arthropod vectors of pathogens and their role in the epidemiology and management of disease. Credit will not be awarded both for ANRS 6314 and WSES 5314.

WSES 5315. Insect Taxonomy and Systematics. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Advance study of the taxonomy and identification of insects and other arthropods. Students will utilize various collecting techniques and dichotomous keys to obtain and identify arthropods. Credit will not be awarded both for ANRS 6315 and WSES 5315.

WSES 5316. Grant Writing and Funding Acquisition. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
A course in terminology and processes associated with grant writing and the acquisitions of research funds. Credit will only be awarded for one of the following: ANRS 6316, ANSC 5316, and WSES 5316.

WSES 5317. Population Ecology. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Advanced course in population biology, including theoretical and analytical applications focused on demographic rates, population growth, predator-prey relationships, and competition. Credit will not be awarded for both ANRS 6317 and WSES 5317.

WSES 5318. Spatial Ecology and Conservation Modeling. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
The main objective of this course is to develop student's in-depth understanding of spatial ecology as it pertains to landscape-level natural resource conservation and management problems. The course will focus on developing critical theoretical and practical skills to understand spatial patterns and processes that impact interacting ecological communities in various different ways. The ultimate purpose of this course is to enable students examine and tackle issues inherent in landscape management for preserving species and ecological communities. Credit will not be awarded for WSES 4318 and WSES 5318. Prerequisite: Undergraduate general ecology or equivalent course; undergraduate introductory GIS course or equivalent.

WSES 5320. Advanced Topics in Ecosystem Biogeochemistry. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Multidisciplinary analysis of energy and nutrient transfers within terrestrial ecosystems. Examination of processes system interactions between the atmosphere, biosphere, lithosphere, and hydrosphere.

WSES 5331. Professional Communication. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Advanced discussion of techniques for communicating technical information to diverse audiences. Topics covered will include written and oral communication, using numerous formats. Prerequisite: Graduate standing.

WSES 5341. Southern African Ecology and Culture. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Ecology of southern Africa, including climate, soils, vegetation, and wildlife. Ecological interactions with development, agriculture, and tourism. Identification and ecology of bird and large mammal species. Conservation of rare, threatened, and endangered species. Culture, politics, and history from the pre-Colonial Period through today, with emphasis a focus on their effects on wildlife and ecosystem management of natural resources. Focuses mainly on South Africa, Botswana, Zambia, and Namibia.

WSES 5342. Study Abroad. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Conducted at various domestic and international locations for extended periods (frequently outside the United States). Hands-on activities and experiences in agriculture and natural resources. Topics will vary. Enrollment in this course requires a significant study abroad program fee.

WSES 5350. Pedology. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Topics selected from studies of soil-forming processes, soil-geomorphic relations, mineral weathering, new developments in soil classification, and development of pedologic theory. Topics vary from year to year. May be repeated one time for credit. Prerequisites: Graduate standing with a major in MS-ANRS or MS-ENVS, and the successful completion of a soil science course.

WSES 5360. Research Methods for Agricultural and Natural Resource Scientists. 3 Credit Hours (Lecture: 2 Hours, Lab: 2 Hours).
Research design, database management, application and evaluation of statistics and statistical modeling approaches, inferences, and presentation of results. Introduction to programming language for statistical computing and graphics. Applicable to students interested in research at the individual or population level, such as observational, behavioral, or experimental studies conducted in the field or laboratory. Basic understanding of statistical analyses strongly recommended. Credit will not be awarded for both ANRS 6360 and WSES 5360. Prerequisites: Graduate standing with a major in MS-ANRS, MS-BIOL, MS-ENVS, or MS-ANSC, and successful completion of a biostatistics course.

WSES 5380. Research Writing for Agricultural and Environmental Science. 3 Credit Hours (Lecture: 3 Hours, Lab: 0 Hours).
Preparation of writing samples, technical reviews, and/or professional manuscripts related to various topics in agriculture or environmental sciences. Credit will not be awarded for both ANRS 6380 and WSES 5380. Prerequisites: Graduate standing with a major in MS-ANRS, MS-BIOL, MS-ENVS, or MS-ANSC.

WSES 5405. Ecological Modeling for Natural Resource Management. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).
An advanced course in the use of computer simulations to model and analyze ecological systems. Based on a firm foundation of system theory, the course addresses the conceptual design, building, evaluation, and testing of simulation models; and the use of models to answer ecological questions. Credit will not be awarded for both ANRS 6405 and WSES 5405.

WSES 5410. Genomics. 4 Credit Hours (Lecture: 3 Hours, Lab: 3 Hours).
Technological advancements in DNA sequencing are producing a much more complete picture of how diverse, ubiquitous, and important microbes are in all living systems. This course will provide students with an overview of the roles that microbes play in human health, agricultural production, and ecosystem functionality. A laboratory component will include massively parallel DNA sequencing and microbial community analysis of niche environments utilizing millions of DNA sequence tags. Prerequisite: BIOL 3407 or equivalent. Lab fee: $2.