

FOREST AND WILDLIFE ECOLOGY (F&W ECOL)

F&W ECOL 1 – COOPERATIVE EDUCATION/CO-OP IN FOREST & WILDLIFE ECOLOGY

1 credit.

Full-time off-campus work experience which combines classroom theory with practical knowledge of operations to provide students with a background upon which to base a professional career. Students receive credit only for the term in which they are actively enrolled and working. The same work experience may not count towards credit in F&W ECOL 399.

Requisites: Consent of instructor

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2018

F&W ECOL/ENVIR ST 100 – FORESTS OF THE WORLD

3 credits.

Ecology and conservation of a wide range of forests, from tropical rain and dry forests, boreal forests, to temperate forests, outside of the USA. The main threats to forests, and different strategies to solve conservation and sustainable management issues in international forestry. Trade-offs in forest conservation and management, resulting from different values that people place on forests, issues in equity and equality in access to forest resources. The role of forests in climate change and extinction of species.

Requisites: None

Course Designation: Breadth - Either Biological Science or Social Science

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

Learning Outcomes: 1. Identify relevant stakeholders in forest landscapes across the world

Audience: Undergraduate

2. Give examples of conservation threats to forests in countries other than the USA and relevant solutions

Audience: Undergraduate

3. Communicate about evidence on forest conservation and threats rigorously, correctly, and under different formats

Audience: Undergraduate

4. Demonstrate, on specific examples, how trade-offs in forest conservation originate and work

Audience: Undergraduate

5. Explain the role of forests in solutions to climate change and species extinctions

Audience: Undergraduate

F&W ECOL 101 – ORIENTATION TO WILDLIFE ECOLOGY

1 credit.

Introduction to Wildlife Ecology and the profession of wildlife management/conservation. Emphasis on preparing for a successful career.

Requisites: Declared in Wildlife Ecology

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL 110 – LIVING WITH WILDLIFE - ANIMALS, HABITATS, AND HUMAN INTERACTIONS

3 credits.

A general survey of wildlife and wildlife conservation. Basic characteristics and management of wildlife populations and habitats. Human perceptions and interactions with wildlife. Current issues in wildlife management and conservation.

Requisites: None

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL/C&E SOC/SOC 248 – ENVIRONMENT, NATURAL RESOURCES, AND SOCIETY

3 credits.

Introduces the concerns and principles of sociology through examination of human interaction with the natural environment. Places environmental issues such as resource depletion, population growth, food production, environmental regulation, and sustainability in national and global perspectives.

Requisites: None

Course Designation: Breadth - Social Science

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL/BOTANY 250 – FORESTS AND HUMANS: FROM THE MIDWEST TO MADAGASCAR

2 credits.

Provides an overview of the geography, ecology, and economic importance of the world's forest biomes. Learn how climate influences vegetation and, in-turn, how forests impact global climate. Meet scientists working to understand the astounding biodiversity and ecological complexity of forest ecosystems, and how these ecosystems support human life. Discuss the threats to forest ecosystems around the world, and hear from the people trying to protect them. Emphasizes the forest resources and services upon which humans depend, and how we can maintain these resources into the future. Analyze the idea of "sustainability" when it comes to forest management, hear alternative viewpoints about what this word means, and discuss potential trade-offs and conflicts. Look at the many real-world programs in place at the global, national, and local level to sustainably manage forests.

Requisites: None**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No**Last Taught:** Summer 2020**F&W ECOL 289 – HONORS INDEPENDENT STUDY**

1-2 credits.

Research work for Honors students under direct guidance of a faculty member in an area of Forest and Wildlife Ecology. Students are responsible for arranging the work and credits with the supervising instructor.

Requisites: Consent of instructor**Course Designation:** Honors - Honors Only Courses (H)**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Spring 2001**F&W ECOL 299 – INDEPENDENT STUDY**

1-3 credits.

Research work for students under direct guidance of a faculty member in an area of Forest and Wildlife Ecology. Students are responsible for arranging the work and credits with the supervising instructor.

Requisites: Consent of instructor**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Fall 2024**F&W ECOL 300 – FOREST MEASUREMENTS**

4 credits.

Field measurements of trees and forests. Basic concepts of statistics and sampling as applied to forestry. Use of aerial photographs, GIS, and satellite imagery.

Requisites: None**Course Designation:** Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Elementary

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No**Last Taught:** Spring 2025**Learning Outcomes:** 1. Demonstrate basic competency in the use of forest measurement equipment and technology#

Audience: Undergraduate

2. Calculate individual tree and stand parameters

Audience: Undergraduate

3. Estimate timber volume

Audience: Undergraduate

4. Apply basic statistics in forestry#

Audience: Undergraduate

5. Produce a simple forest inventory using a variety of sampling techniques

Audience: Undergraduate

6. Communicate the results of data collected in written form

Audience: Undergraduate

F&W ECOL 305 – FOREST OPERATIONS

2 credits.

Introduction to forestry operations in the implementation of forest plans, including site preparation, stand establishment, and harvesting systems. Analysis of costs and productivity, including system balance, marketing, timber procurement, and contractual services.

Requisites: F&W ECOL 300 or 410**Repeatable for Credit:** No**Last Taught:** Spring 2025

F&W ECOL 306 – TERRESTRIAL VERTEBRATES: LIFE HISTORY AND ECOLOGY

4 credits.

Life history, ecology, distribution, and taxonomy of reptiles, amphibians, birds, and mammals. Birds will receive less emphasis. Primary focus is on Wisconsin species, including conservation threats, but covers all major North American families, and surveys major groups of the world. Designed as a foundation for detailed study of vertebrates or to satisfy the need for a scientific introduction to Wisconsin vertebrates.

Requisites: ZOOLOGY/BIOLOGY/BOTANY 151, (ZOOLOGY/BIOLOGY 101 and 102), (BIOCORE 381 and 382), or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2025

F&W ECOL 318 – PRINCIPLES OF WILDLIFE ECOLOGY

3 credits.

Major environmental factors affecting wildlife; structure and behavior of wildlife populations; regional wildlife communities and their conservation.

Requisites: Declared in Wildlife Ecology

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL/ZOOLOGY 335 – HUMAN/ANIMAL RELATIONSHIPS: BIOLOGICAL AND PHILOSOPHICAL ISSUES

3 credits.

An interdisciplinary approach to our complex and often contradictory relationships with non-human animals, including information about the nature, needs and behavior of human and non-human animals in relation to our personal and professional interactions with them.

Requisites: Sophomore standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

F&W ECOL/ENVIR ST/ZOOLOGY 360 – EXTINCTION OF SPECIES

3 credits.

A comprehensive treatment of the ecology, causes, and consequences of species extinction. Ecology and problems of individual species, habitat alteration and degradation, socio-economic pressures and conservation techniques and strategies.

Requisites: Sophomore standing and ZOOLOGY/BIOLOGY/BOTANY 151, (ZOOLOGY/BIOLOGY 101 and 102), BIOLOGY/BOTANY 130, or (BIOCORE 381 and 382)

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL/ENVIR ST/G L E/GEOG/GEOSCI/LAND ARC 371 – INTRODUCTION TO ENVIRONMENTAL REMOTE SENSING

3 credits.

Introduction to the Earth as viewed from above, focusing on use of aerial photography and satellite imagery to study the environment. Includes physical processes of electromagnetic radiation, data types and sensing capabilities, methods for interpretation, analysis and mapping, and applications.

Requisites: (Sophomore standing and MATH 113, 114, or 171), graduate/professional standing, or member of Engineering Guest Students

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2025

F&W ECOL 375 – SPECIAL TOPICS

1-4 credits.

Specialized subject matter of current interest to undergraduate students.

Requisites: None

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

F&W ECOL 379 – PRINCIPLES OF WILDLIFE MANAGEMENT

3 credits.

Ways of conserving desired numbers of animals for the overall best interests of society, be they aesthetic, ecological, economic, commercial or recreational; includes management of endangered species, exploited species, wildlife communities in nature reserves, and wildlife pests.

Requisites: F&W ECOL 318 or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2025

F&W ECOL 390 – LEARNING TO ACTION: PROFESSIONAL DEVELOPMENT

1 credit.

Preparation for natural resources professions and the job market after graduation. Development of professional skills including communication, ethical decision-making, and conflict resolution. Experience in job searching, editing resumes, and interviewing for jobs.

Requisites: Declared in Forest Science

Repeatable for Credit: No

Last Taught: Fall 2023

Learning Outcomes: 1. Reflect on your internship experience, what you learned, and how it informs your professional future

Audience: Undergraduate

2. Understand opportunities and challenges in forestry and natural resources professions

Audience: Undergraduate

3. Improve your ability to find, apply, and interview for a job

Audience: Undergraduate

4. Improve your facilitation, communication, and conflict resolution skills

Audience: Undergraduate

5. Consider and articulate your desired long-term contributions to natural resources and society

Audience: Undergraduate

F&W ECOL 395 – DATA AND GIS TOOLS FOR ECOLOGY

3 credits.

Quantitative tools applicable to the investigation of ecological problems, including but not limited to, statistics, Geographic Information Systems (GIS), Remote Sensing, and spatial analysis. Overview of commonly used quantitative techniques in ecological sciences with an emphasis on GIS and spatial analysis. Introduces spatial tools and practical applications using ecological/environmental data sets.

Requisites: MATH 113, 114, 171, placement into MATH 221, or graduate/professional standing

Repeatable for Credit: No

Last Taught: Spring 2025

Learning Outcomes: 1. Describe ecological datasets spatially and statistically using data storage and Geographic Information Systems (GIS) tools

Audience: Undergraduate

2. Acquire and map spatially explicit ecological data using GIS tools

Audience: Undergraduate

3. Identify patterns in complex ecological data sets

Audience: Undergraduate

4. Conduct common statistical analysis of digitized ecological data (such as: description, correlation, univariate regression, and hypothesis testing)

Audience: Undergraduate

5. Critically evaluate the results of statistical analyses, including validation, of ecological datasets

Audience: Undergraduate

F&W ECOL 399 – COORDINATIVE INTERNSHIP/COOPERATIVE EDUCATION

1-8 credits.

An internship under guidance of a faculty or instructional academic staff member in Forest and Wildlife Ecology and an internship site supervisor. Students are responsible for arranging the work and credits with the faculty or instructional academic staff member and the internship site supervisor.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Workplace - Workplace Experience Course

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2024

F&W ECOL 400 – STUDY ABROAD IN FOREST AND WILDLIFE ECOLOGY

1-6 credits.

Provides an area equivalency for courses taken on Madison Study Abroad Programs that do not equate to existing UW courses. Current enrollment in a UW-Madison study abroad program

Requisites: None

Repeatable for Credit: Yes, unlimited number of completions

F&W ECOL 401 – PHYSIOLOGICAL ANIMAL ECOLOGY

3 credits.

Physiological adaptation and function in wild animals, primarily birds, mammals, reptiles, amphibians. Focus on interactions between animals and their environment, and relationships between animal physiology and the ecology and dynamics of populations.

Requisites: ZOOLOGY/BIOLOGY/BOTANY 151, (ZOOLOGY/BIOLOGY 101 and 102), (BIOCORE 381 and 382), or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2021

F&W ECOL/BOTANY 402 – DENDROLOGY: WOODY PLANT IDENTIFICATION AND ECOLOGY

3 credits.

Identification, ecological characteristics, ranges, adaptations to environment, and uses of evergreen and deciduous woody plants, with emphasis on species native to Wisconsin; lab and field work.

Requisites: Sophomore standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2024

Learning Outcomes: 1. Identify all native Wisconsin trees, some common shrubs and vines, and a few important woody exotics by common and scientific name, in summer or winter condition.

Audience: Both Grad & Undergrad

2. Demonstrate a basic understanding of wood structure and use a key to identify blocks of wood.

Audience: Both Grad & Undergrad

3. Recognize the characteristic tree taxa of some of the world's major forest types and some interesting examples of the diversity of trees and their adaptations to their environments.

Audience: Both Grad & Undergrad

4. Compare the morphology, life history, and ecology of woody species to their distribution and habits.

Audience: Both Grad & Undergrad

5. Understand how humans affect the composition, structure and economic value of tree communities and apply this information to questions about management of woody vegetation under changing conditions.

Audience: Both Grad & Undergrad

6. Compare at least two methods for learning to identify a plant species using evidence from your experience in this course.

Audience: Both Grad & Undergrad

7. Construct new materials to teach woody plant ID or tree management issues to a particular target audience.

Audience: Graduate

8. Survey current scientific literature on a particular topic relevant to management of woody vegetation under changing conditions, and summarize current knowledge and knowledge gaps. Recommend next steps in research to improve management.

Audience: Graduate

F&W ECOL 410 – PRINCIPLES OF SILVICULTURE

3 credits.

Ecologically-based forest management principles for sustainable timber production, maintenance or restoration of biological diversity, and maintenance of aesthetic quality and site productivity. Includes coverage of even-aged and uneven-aged management, reforestation principles, and ecological restoration techniques.

Requisites: ZOOLOGY/BOTANY/F&W ECOL 460, F&W ECOL 550, declared in Forest Science or Wildlife Ecology, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2025

F&W ECOL 411 – PRACTICES OF SILVICULTURE

1 credit.

Utilization of ecologically-based forest management practices for sustainable timber production, maintenance or restoration of biological diversity, and maintenance of aesthetic quality and site productivity. Includes coverage of even-aged and uneven-aged management, reforestation principles, and ecological restoration techniques.

Requisites: F&W ECOL 410 or concurrent enrollment

Repeatable for Credit: No

Last Taught: Spring 2025

F&W ECOL 420 – REGULATED TRAPPING IN WILDLIFE MANAGEMENT AND CONSERVATION

1 credit.

Training and professional skill development for future natural resources professionals. Introduction to the importance of regulated trapping as a technique used in research, wildlife damage management, wildlife reintroduction, disease management, fur/food acquisition, etc.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Spring 2024

Learning Outcomes: 1. Identify the important biological and ecological aspects of furbearers

Audience: Undergraduate

2. Discuss furbearer management related laws and regulations, research, population modeling, and furbearer diseases

Audience: Undergraduate

3. Explain how regulated trapping is used by State, Federal and Tribal agencies to manage wildlife and their habitats

Audience: Undergraduate

4. Describe the many benefits of regulated trapping to society

Audience: Undergraduate

5. Identify terminology and workings of several types of traps, sets, and trapping equipment used to legally harvest furbearers and to avoid non-target species

Audience: Undergraduate

6. Summarize the goals of the Best Management Practices for Trapping Program (BMPs)

Audience: Undergraduate

7. Demonstrate proper fur handling and processing and knowledge of related terminology

Audience: Undergraduate

8. Communicate effectively about regulated trapping

Audience: Undergraduate

F&W ECOL 424 – WILDLIFE ECOLOGY SUMMER FIELD PRACTICUM

2 credits.

Practicum emphasizing research and habitat management techniques through individual and group field work, tours, demonstrations and lectures.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Summer 2024

F&W ECOL 448 – DISTURBANCE ECOLOGY

3 credits.

An introduction to fire, wind, flooding, disease, insects and other disturbance regimes that serve as primary drivers of the structure and function of terrestrial ecosystems. Discusses how these disturbances interact, using case studies and data that highlight the role of disturbance in different ecosystems (e.g. grasslands, forests, tundra) with a focus on the ecosystem services they provide. Discusses and critiques management strategies used to mitigate biotic and abiotic disturbances, gaining critical insights from the literature as well as personal perspectives and experiences.

Requisites: BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2025

Learning Outcomes: 1. Identify what characteristics are necessary to refer to an event as a disturbance and clearly define ways in which disturbances are categorized

Audience: Undergraduate

2. Determine and discuss mechanisms underlying different disturbance regimes in the context of ecological theory and observations

Audience: Undergraduate

3. Interpret, critique, and appropriately cite primary scientific literature in the field of disturbance ecology and extract critical information from figures and graphs

Audience: Undergraduate

4. Analyze and interpret data collected at various scales that relate to the causes and consequences of various disturbance regimes and identify the limitations and advantages of each data type

Audience: Undergraduate

5. Describe (through examples and case studies) how different disturbances interact with each other using appropriate terminology and definitions and evaluate context-dependent consequences for ecosystem function

Audience: Undergraduate

6. Evaluate how disturbance risk is assessed in various systems and determine approaches that are most amenable to intervention based on costs, benefits, and feasibility

Audience: Undergraduate

F&W ECOL 449 – DISTURBANCE ECOLOGY LAB (I): HERBIVORES AND FIRE

1 credit.

Explores natural and anthropogenic disturbances occurring in forest ecosystems through hands on learning experiences. Emphasis on the role of herbivores and fire with examination of management strategies. Applies basic ecological laboratory and field techniques to understanding disturbances that change the physical environment and disrupt ecosystem structure.

Requisites: BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2025

Learning Outcomes: 1. Discuss the importance of disturbance for ecosystem processes (e.g., nutrient cycling, biodiversity, soil development, etc.)

Audience: Undergraduate

2. Describe the effect of herbivores and fire on local forest habitats.

Audience: Undergraduate

3. Identify native and non-native members of local forest ecosystems and explain how they respond to herbivory and fire.

Audience: Undergraduate

4. Explain how population and community dynamics of plants are influenced by disturbance, stress, and species interactions.

Audience: Undergraduate

5. Formulate novel hypotheses related to declining forest understory biodiversity, design experimental protocols to falsify those hypotheses, and communicate research proposals in oral and written forms to a scientific audience.

Audience: Undergraduate

6. Apply basic ecological laboratory and field techniques to understanding ecological principles.

Audience: Undergraduate

F&W ECOL 450 – DISTURBANCE ECOLOGY LAB (II): FOREST PATHOGENS

1 credit.

Explores natural and anthropogenic disturbances occurring in forest ecosystems through hands on learning experiences. Focuses on the causes of impoverished forests and the role and management of pathogens. Applies basic ecological laboratory and field techniques to understanding disturbances that change the physical environment and disrupt ecosystem structure.

Requisites: BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

Learning Outcomes: 1. Discuss the importance of disturbance for ecosystem processes (e.g., nutrient cycling, biodiversity, soil development, etc.)

Audience: Undergraduate

2. Describe the problems associated with and causes of depauperate understories in the Deciduous Forest Biome.

Audience: Undergraduate

3. Describe the role of pathogens (including fungi, bacteria, and viruses) in forest disturbance.

Audience: Undergraduate

4. Explain how population and community dynamics of plants are influenced by disturbance, stress, and species interactions.

Audience: Undergraduate

5. Test novel hypotheses related to declining forest understory biodiversity, implement experimental protocols to falsify those hypotheses, graph/analyze/interpret results, and communicate these results in oral and written forms to a scientific audience.

Audience: Undergraduate

6. Apply basic ecological laboratory and field techniques to understanding ecological principles.

Audience: Undergraduate

F&W ECOL/SOIL SCI 451 – ENVIRONMENTAL BIOGEOCHEMISTRY

3 credits.

Explores long and short-term cycles of carbon, nitrogen, phosphorus, sulfur, and metals as well as water and energy cycles between water, the atmosphere, terrestrial vegetation, and soils. Emphasizes the linkage between terrestrial vegetation and soils across global biomes for managed and unmanaged ecosystems. Investigates biogeochemical processes through their biochemical constituents, conceptual models and exploration of isotopic and chemical data. Provides a practical understanding of the interactions between components and fluxes of terrestrial ecosystems and how data is developed and employed.

Requisites: CHEM 104, 109, 116, or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2024

Learning Outcomes: 1. Describe global biogeochemical cycles of C, N, P, K, S, Fe, energy, and water and their importance

Audience: Both Grad & Undergrad

2. Explain the importance of human perturbations to and management of biogeochemical cycles

Audience: Both Grad & Undergrad

3. Describe key methods used to study biogeochemistry and explain their limitations

Audience: Both Grad & Undergrad

4. Predict which biogeochemical reactions would be likely across different environments and conditions

Audience: Both Grad & Undergrad

5. Discuss and critically evaluate scientific papers in biogeochemistry at a graduate level

Audience: Graduate

6. Discuss and critically evaluate scientific papers in biogeochemistry at an advanced undergraduate level

Audience: Undergraduate

7. Characterize elemental cycling within a system of interest, comparing and contrasting different elements

Audience: Graduate

8. Characterize elemental cycling within a system of interest

Audience: Undergraduate

F&W ECOL/BOTANY 455 – THE VEGETATION OF WISCONSIN

4 credits.

Ecology of Wisconsin plant communities: floristic composition, community structure; relationship to history, climate, soil, and geology; response to human perturbation.

Requisites: ZOOLOGY/BIOLOGY/BOTANY 151, BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY 101, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL 458 – ENVIRONMENTAL DATA SCIENCE

3 credits.

Introduces fundamental machine learning techniques for numerical modeling and data analysis and modern computer programming tools used to analyze, prepare, and visualize data from common formats of datasets in the field of Earth and environmental sciences. Emphasizes opportunities to consider real-world applications for concepts in environmental data science.

Requisites: STAT 240, 301, 324, 371, or graduate/professional standing

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2025

Learning Outcomes: 1. Demonstrate introductory skills in using collaboration technology (e.g. Jupyter Notebooks) to write, edit, and run programs in a scientific programming language (e.g. Python)

Audience: Both Grad & Undergrad

2. Recognize, read, write and use common environmental dataset formats

Audience: Both Grad & Undergrad

3. Use a scientific programming language (e.g. Python) to read and process environmental data

Audience: Both Grad & Undergrad

4. Produce visualizations of environmental data, including basic scientific charts, statistics, and maps

Audience: Both Grad & Undergrad

5. Understand fundamentals of modern machine learning algorithms and gain experience of practical use of them

Audience: Both Grad & Undergrad

6. Solve real-world data science problems individually and in teams

Audience: Both Grad & Undergrad

7. Identify the frontiers in real-world environmental science challenges and how data science can help

Audience: Both Grad & Undergrad

8. Identify a problem in environmental science that may be solved or better understood through data science, provide a basic visualization or analysis of a data set associated with that problem, and communicate findings effectively

Audience: Undergraduate

9. Develop in-depth spatial and/temporal analyses using advanced data science tools (such as machine learning) and visual datasets related to your own research or anticipated area of research that meet the standards of scientific journals, critically evaluate your findings, and situate them within the larger context of current research literature

Audience: Graduate

F&W ECOL/BOTANY/ZOOLOGY 460 – GENERAL ECOLOGY

4 credits.

Ecology of individual organisms, populations, communities, ecosystems, landscapes, and the biosphere. The interaction of organisms with each other and their physical environment. These relationships are studied, often in quantitative terms, in both field and laboratory settings.

Requisites: Satisfied Quantitative Reasoning (QR) A requirement and ZOOLOGY/BIOLOGY/BOTANY 152, (ZOOLOGY/BIOLOGY 101 and 102), BIOCORE 381, or BOTANY/BIOLOGY 130, or graduate/professional standing

Course Designation: Gen Ed - Quantitative Reasoning Part B
Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Spring 2025**F&W ECOL/ENVIR ST 515 – NATURAL RESOURCES POLICY**

3 credits.

Examine natural resources policy and law in the United States relating to forests, wildlife, and other natural resources. Investigates the policy-making process and the role of science, values, property, economics, and justice in the development of federal and state resources policy. Practice professional written and oral communication and ethical engagement in resources policy and administration.

Requisites: Satisfied Communications A requirement or graduate/professional standing

Course Designation: Gen Ed - Communication Part B
Breadth - Social Science

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Fall 2024**F&W ECOL/AN SCI/ZOOLOGY 520 – ORNITHOLOGY**

3 credits.

Introduction to bird biology, ecology, and behavior. Topics include the evolutionary origin of birds and flight, anatomy and physiology, functional morphology, migration, communication, reproductive strategies, ecological adaptations and roles, and biogeographical patterns.

Requisites: ZOOLOGY/BIOLOGY 101 and 102, ZOOLOGY/BIOLOGY/BOTANY 152, (BIOCORE 381 and 382), or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Spring 2025**F&W ECOL/AN SCI/ZOOLOGY 521 – BIRDS OF SOUTHERN WISCONSIN**

3 credits.

Outdoor and indoor labs/lectures emphasizing identification of southern Wisconsin birds by sight and vocalization. Two required Saturday field trips in Southern Wisconsin.

Requisites: ZOOLOGY/BIOLOGY 101 and 102, ZOOLOGY/BIOLOGY/BOTANY 152, (BIOCORE 381 and 382), or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Spring 2025**F&W ECOL/A A E/ECON 531 – NATURAL RESOURCE ECONOMICS**

3 credits.

Economic concepts and tools relating to management and use of natural resources, including pricing principles, cost-benefit analysis, equity, externalities, economic rent, renewable and nonrenewable resources, and resource policy issues.

Requisites: ECON 301 or 311 or graduate/professional standing

Course Designation: Breadth - Social Science

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No**Last Taught:** Spring 2025

Learning Outcomes: 1. Employ appropriate concepts in order to correctly define the economic benefits accrued from different natural resources.

Audience: Both Grad & Undergrad

2. Apply appropriate methodologies and tools to demonstrate the conditions under which the benefits are likely to be captured or dissipated by real world actors.

Audience: Both Grad & Undergrad

3. Explain the social, economic, and/or environmental dimensions of the sustainability challenges of maintaining healthy supplies of forests, biodiversity, fish and wildlife, and freshwater.

Audience: Both Grad & Undergrad

4. Analyze the causes of and solutions for the sustainability challenges of maintaining healthy supplies of forests, biodiversity, fish and wildlife, and freshwater.

Audience: Both Grad & Undergrad

5. Apply academic principles of natural resource economics to a real-world policy problem.

Audience: Graduate

F&W ECOL/SURG SCI 548 – DISEASES OF WILDLIFE

3 credits.

Provides an overview of the issues involved across a wide range of wildlife diseases, presented within the context of ecosystem health or "one health". Content will be on the biological, epidemiological, clinical, public health and, in some cases, sociopolitical ramifications of wildlife diseases. Covers a wide variety of wildlife diseases caused by bacteria, viruses, parasites, prions, and environmental contaminants. Consequences associated with environmental changes on the manifestation of wildlife diseases will also be discussed. This range of diseases will be presented in order to familiarize the many facets involved in disease management, from animal and human health issues, to ecological and environmental considerations, to the role of society in contributing to, and managing, these diseases.

Requisites: BOTANY/BIOLOGY 130, (ZOOLOGY/BIOLOGY 101 and 102), ZOOLOGY/BIOLOGY/BOTANY 151, BIOCORE 381, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

Learning Outcomes: 1. Explain how an infection differs from disease.

Audience: Undergraduate

2. Recognize different groups of infectious microorganisms: viruses, bacteria, fungi, parasites, prions, etc.

Audience: Undergraduate

3. Define and describe ecosystem health or one health.

Audience: Undergraduate

4. Define the terms zoonosis, zoonoses, and zoonotic.

Audience: Undergraduate

5. Evaluate how anthropogenic influences exacerbate transmission of zoonotic diseases.

Audience: Undergraduate

6. Describe and explain the epidemiological concepts related to each wildlife disease presented in this course.

Audience: Undergraduate

7. Recognize diseases that are specific to animal groups or humans, or are nonspecific, having the potential to infect many different species.

Audience: Undergraduate

F&W ECOL 550 – FOREST ECOLOGY

3 credits.

Introduction to major abiotic and biotic factors that influence forest ecosystem composition, structure, and function. Reviews important processes that influence structure and function of forest ecosystems. Uses basic ecosystem concepts to elucidate influence of anthropogenic (including forest management) and natural disturbances on forest ecosystem structure and function.

Requisites: BOTANY/BIOLOGY 130, ZOOLOGY/BIOLOGY/BOTANY 152, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL 551 – FOREST ECOLOGY LAB

1 credit.

Review concepts presented in F&W ECOL 550 by exposing the key concepts and processes discussed that can best be seen in the field or illustrated with the use of ecosystem models.

Requisites: F&W ECOL 550 or concurrent enrollment, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL 561 – WILDLIFE MANAGEMENT TECHNIQUES

3 credits.

Preparation of collections, analyses of food habits, sex and age determinations, censuses, trapping and banding, planting food and cover, research techniques.

Requisites: None

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL/LAND ARC/ZOOLOGY 565 – PRINCIPLES OF LANDSCAPE ECOLOGY

2 credits.

Emphasizes the importance of spatial patterns at broad scales. Concepts and applications are covered.

Requisites: (ZOOLOGY/BOTANY/F&W ECOL 460 or F&W ECOL 550) and (STAT 301, 371, or F&W ECOL/STAT 571), or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2019

F&W ECOL/STAT 571 – STATISTICAL METHODS FOR BIOSCIENCE I

4 credits.

Descriptive statistics, distributions, one- and two-sample normal inference, power, one-way ANOVA, simple linear regression, categorical data, non-parametric methods; underlying assumptions and diagnostic work.

Requisites: Graduate/professional standing

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL/STAT 572 – STATISTICAL METHODS FOR BIOSCIENCE II

4 credits.

Polynomial regression, multiple regression, two-way ANOVA with and without interaction, split-plot design, subsampling, analysis of covariance, elementary sampling, introduction to bioassay.

Requisites: STAT/F&W ECOL 571

Course Designation: Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2025

F&W ECOL 577 – COMPLEXITY AND CONSERVATION OF WHITE-TAILED DEER

3 credits.

Solve problems that arise in the conservation and management of wildlife populations requires that managers understand and evaluate human cultural, economic, and political issues in addition to ecological issues. Use case studies to understand the interdisciplinary nature of wildlife management while gaining practical hands-on experiences.

Requisites: Declared in Wildlife Ecology and Junior Standing

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL 590 – INTEGRATED RESOURCE MANAGEMENT

3 credits.

Resource management planning in state and federal land management agencies. Apply principles by working in teams to develop a management plan for a real property by inventorying resources; developing management objectives and alternatives; and analyzing their ecological, social and institutional implications.

Requisites: Declared in Forest Science, Junior Standing, and F&W ECOL 658

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL 599 – WILDLIFE RESEARCH CAPSTONE

3 credits.

Synthesize concepts in wildlife ecology and prepare for a wildlife research career. Develop a professional-quality research proposal for an extended project, carry out a pilot ecological field study, and design and implement a social survey questionnaire.

Requisites: F&W ECOL 561

Repeatable for Credit: No

Last Taught: Spring 2025

F&W ECOL/ENTOM/PL PATH/SOIL SCI 606 – COLLOQUIUM IN ENVIRONMENTAL TOXICOLOGY

1 credit.

Current topics in molecular and environmental toxicology and problems related to biologically active substances in the environment. Topics vary each semester. Lectures are by resident and visiting professors and other researchers.

Requisites: ZOOLOGY/BIOLOGY 101 or BOTANY/BIOLOGY 130 or ZOOLOGY/BIOLOGY/BOTANY 151, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Intermediate

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2016

F&W ECOL/BOTANY/ENVIR ST/ZOOLOGY 651 – CONSERVATION BIOLOGY

3 credits.

Application of ecological principles and human dimensions to the conservation of biological diversity. Topics: biodiversity science; conservation planning; population ecology; habitat loss, species exploitation, invasive species, pollution; human attitudes and activities as they affect the biosphere; approaches to monitoring interventions.

Requisites: Satisfied Quantitative Reasoning (QR) A requirement and ZOOLOGY/BOTANY 450, F&W ECOL/BOTANY 455, ZOOLOGY/BOTANY/F&W ECOL 460, or graduate/professional standing

Course Designation: Gen Ed - Quantitative Reasoning Part B

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2025

F&W ECOL/A A E 652 – DECISION METHODS FOR NATURAL RESOURCE MANAGERS

3 credits.

Applications of quantitative methods, including optimization and simulation, to the management of natural resources, especially forests.

Requisites: MATH 112, 114, or 171 or placement into MATH 211 or 221

Course Designation: Breadth – Social Science

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: No

Last Taught: Spring 2025

Learning Outcomes: 1. Quantify the timber and non-timber values of forest resources

Audience: Undergraduate

2. Describe and apply financial decision criteria to evaluate forest investments

Audience: Undergraduate

3. Explain how optimal rotation ages are determined and what factors affect this calculation

Audience: Undergraduate

4. Create harvest scheduling models and apply them to diverse landowner objectives

Audience: Undergraduate

5. Apply knowledge of mathematical models and financial theory to determine optimal rotation age for a given species and communicate findings in written and verbal formats

Audience: Undergraduate

F&W ECOL 655 – ANIMAL POPULATION DYNAMICS

3 credits.

Fluctuations of animal populations: techniques of study, documentation, controls.

Requisites: (F&W ECOL 318 or ZOOLOGY/BOTANY/F&W ECOL 460) and (MATH 112, 114, 171 or placement into MATH 221), or graduate/professional standing

Course Designation: Breadth – Biological Sci. Counts toward the Natural Sci req

Level – Intermediate

L&S Credit – Counts as Liberal Arts and Science credit in L&S

Grad 50% – Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2025

Learning Outcomes: 1. Apply field specific vocabulary and foundational theories of population dynamics to describe current understandings of how animal populations behave and interact

Audience: Both Grad & Undergrad

2. Assess how existing theories, models, and field data are understood and applied in wildlife conservation

Audience: Both Grad & Undergrad

3. Analyze population dynamics using species-specific examples that would be relevant to a professional wildlife biologist using data and conceptual models

Audience: Both Grad & Undergrad

4. Synthesize, evaluate, and formulate a position on current scholarly research in a focused area of population dynamics

Audience: Graduate

5. Demonstrate oral communication skills including identification and explanation of relevant content, clear organization, and effective delivery

Audience: Graduate

F&W ECOL 658 – FOREST RESOURCES PRACTICUM

3 credits.

Field training and experience; exposure to forestry operations, equipment, procedures, and management problems.

Requisites: None

Repeatable for Credit: No

Last Taught: Summer 2023

F&W ECOL/ZOOLOGY 660 – CLIMATE CHANGE ECOLOGY

3 credits.

The evidence that the Earth's climate is changing at unprecedented rates is now overwhelming. Environmental tipping points are being crossed and many species are adapting or failing to adapt. Climate change poses a significant problem for conserving and managing wildlife and their habitats. Climate change, its ecological impacts, and the principle of climate change adaptation in natural resources conservation will be discussed.

Requisites: BOTANY/BIOLOGY/ZOOLOGY 152, (BIOLOGY/ZOOLOGY 101 and 102), BIOCORE 381, or BIOLOGY/BOTANY 130, or graduate/professional standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2024

Learning Outcomes: 1. explain historic and future trends in climate change within an ecological context.

Audience: Both Grad & Undergrad

2. identify the eco-evolutionary impacts of climate change on biological communities (including changes in phenology and ranges, community dynamics, and altered trophic interactions).

Audience: Both Grad & Undergrad

3. develop a climate change vulnerability assessment for a given species or community.

Audience: Both Grad & Undergrad

4. analyze and incorporate climate and biological data in vulnerability assessments.

Audience: Graduate

F&W ECOL/BOTANY/ZOOLOGY 672 – HISTORICAL ECOLOGY

2 credits.

Study the importance of past events for current ecosystems. Emphasizes concepts and applications.

Requisites: Senior standing

Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req

Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2024

F&W ECOL 675 – PROFESSIONAL DEVELOPMENT IN FOREST & WILDLIFE ECOLOGY

1 credit.

Provides opportunities for additional training in professional development skills relevant to careers in natural resources.

Requisites: None

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

F&W ECOL 681 – SENIOR HONORS THESIS

2-4 credits.

Individual study for undergraduate students in an Honors program completing a thesis in the area of Forest and Wildlife Ecology, as arranged with a faculty member.

Requisites: Consent of instructor

Course Designation: Honors - Honors Only Courses (H)

Repeatable for Credit: No

Last Taught: Fall 2023

F&W ECOL 682 – SENIOR HONORS THESIS

2-4 credits.

Second semester of individual study for undergraduate students in an Honors program completing a thesis in the area of Forest and Wildlife Ecology, as arranged with a faculty member.

Requisites: Consent of instructor

Course Designation: Honors - Honors Only Courses (H)

Repeatable for Credit: No

Last Taught: Spring 2024

F&W ECOL 691 – SENIOR THESIS

2-4 credits.

Independent research for Honors students completing a thesis in the areas of Forest Science or Wildlife Ecology, under the guidance of a faculty member.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL 692 – SENIOR THESIS

2-4 credits.

Independent research for Honors students completing a thesis in the areas of Forest Science or Wildlife Ecology, under the guidance of a faculty member.

Requisites: Consent of instructor

Repeatable for Credit: No

Last Taught: Fall 2024

F&W ECOL 699 – SPECIAL PROBLEMS

1-4 credits.

Individual advanced work in an area of Forest and Wildlife Ecology under the direct guidance of a faculty member.

Requisites: Consent of instructor

Course Designation: Level - Advanced

L&S Credit - Counts as Liberal Arts and Science credit in L&S

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

F&W ECOL/ENTOM 711 – MULTIVARIATE ANALYSIS OF ECOLOGICAL AND COMMUNITY DATA

2 credits.

Examines common methods of multivariate data analysis in ecology and environmental science. Covers methods for the analysis of complex, multidimensional datasets that are collected in the study of plant, invertebrate, fish, and bird communities. Addresses the concurrent analysis of the environmental factors that may drive community distributions. Provides the basis for predictive modeling of distributions across landscapes. General methods covered include ordination (PCA, DCA, NMDS, CCA), clustering (or classification), and other comparative analyses of data matrices (ANOSIM, Mantel tests). Includes an applied, "hands-on" approach on how to use these tools, and the circumstances under which their uses are either appropriate or inappropriate.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2025**F&W ECOL 799 – PRACTICUM IN FORESTRY AND WILDLIFE ECOLOGYTEACHING**

1-3 credits.

Instructional orientation to teaching at the higher education level in the agricultural and life sciences, direct teaching experience under faculty supervision, experience in testing and evaluation of students, and the analysis of teaching performance.

Requisites: Consent of instructor**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2022**F&W ECOL/BOTANY/ENTOM/ZOOLOGY 821 – FOUNDATIONS OF ECOLOGY**

2 credits.

Foundational ideas in the field of ecology. Discussion topics trace the development of ecology as a discipline, and the roots of modern ecological thought, as well as the research approaches in ecology.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2025**Learning Outcomes:** 1. Identify and describe key debates in the history of ecology and ongoing controversies in the field.

Audience: Graduate

2. Differentiate ecological processes and how they sustain ecological systems.

Audience: Graduate

3. Moderate and participate in discussions about the significance of important ecological concepts.

Audience: Graduate

4. Summarize, interpret, and synthesize conceptual theories of ecology orally and in writing.

Audience: Graduate

5. Evaluate peer work and provide constructive, professional feedback.

Audience: Graduate

F&W ECOL 850 – DEMOGRAPHIC METHODS IN WILDLIFE CONSERVATION

3 credits.

Explores the application of demographic methods in the conservation and management of animal populations. Techniques explored include maximum likelihood and Bayesian estimation, count-based models, mark-recapture models, occupancy models, matrix models, and sensitivity analyses. Emphasizes application of these models in conservation decision making.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2025**Learning Outcomes:** 1. Estimate model parameters using maximum likelihood and Bayesian procedures

Audience: Graduate

2. Construct, implement, and interpret output from deterministic and stochastic matrix models of population growth

Audience: Graduate

3. Estimate and model ecological drivers of mortality and survival rates in wildlife populations using mark-recapture modeling methods

Audience: Graduate

4. Estimate and model ecological drivers of site occupancy rates for wildlife populations using occupancy modeling methods

Audience: Graduate

5. Evaluate model limitations, model assumptions, and the effects of violations of assumptions on inference

Audience: Graduate

6. Interpret population model output and apply results to conservation decision making in the face of uncertainty

Audience: Graduate

F&W ECOL 875 – SPECIAL TOPICS

1-4 credits.

Specialized subject matter of current interest to graduate students.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Spring 2025**F&W ECOL/BOTANY/ZOOLOGY 879 – ADVANCED LANDSCAPE ECOLOGY**

3 credits.

Emphasizes spatial patterning (its development and importance for ecological processes) and often focuses on large regions. Learn concepts, methods, and applications of landscape ecology.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2024**F&W ECOL/AGRONOMY/ATM OCN/BOTANY/ENTOM/ENVIR ST/ GEOG/ZOOLOGY 953 – INTRODUCTION TO ECOLOGY RESEARCH AT UW-MADISON**

1-2 credits.

Introduces new graduate students to the diversity of ecologists across the UW-Madison campus. Includes discussions of key topics in professional development, research presentations by faculty members, and discussions of assigned papers with senior graduate students.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Fall 2024**F&W ECOL/DS/URB R PL 955 – PRACTICAL RESEARCH DESIGN AND METHODS OF EMPIRICAL INQUIRY**

3 credits.

Provides a practical introduction to basic concepts of research question formulation, research designs and alternative methods of inquiry, implications for internal validity of the research and generalizability of the findings, operational definitions and measurement validity, reliability, utility and precision.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** No**Last Taught:** Spring 2022**F&W ECOL/ATM OCN/BOTANY/ENVIR ST/GEOG/GEOSCI/ ZOOLOGY 980 – EARTH SYSTEM SCIENCE SEMINAR**

1 credit.

Topics in earth system science. Emphasis on the coupling between atmospheric, oceanic and land surface systems, involving physical geochemical and biological processes, and including interactions with human systems.

Requisites: Graduate/professional standing**Course Designation:** Grad 50% - Counts toward 50% graduate coursework requirement**Repeatable for Credit:** Yes, unlimited number of completions**Last Taught:** Spring 2024

F&W ECOL 990 – RESEARCH AND THESIS

1-12 credits.

Independent research in preparation of a graduate thesis under supervision of a faculty member.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025

F&W ECOL 999 – ADVANCED INDEPENDENT STUDY

1-3 credits.

Independent graduate study under supervision of a faculty member.

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Spring 2025