

Graduate Degree Program in Ecology Colorado State University HANDBOOK

Program Introduction

The Graduate Degree Program in Ecology (GDPE) is an interdisciplinary program for students with interests in a wide range of ecological subjects. The Program is administered by the Warner College of Natural Resources and the College of Natural Sciences, on behalf of all 5 colleges with member departments. We currently have 108 faculty members from 15 departments, and about 116 MS and PhD students. Program admission inquiries should be directed to the information given below:

Graduate Degree Program in Ecology
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Colorado State University
Fort Collins, CO 80523
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email: wendyann@lamar.colostate.edu
Web page: <http://www.colostate.edu/Depts/GDPE/Homepage.html>
Program Directors: Drs. Indy Burke and Bill Lauenroth
(970) 491-1620 or (970) 491-7581

Students enrolled in the Graduate Degree Program in Ecology meet degree requirements by taking several core courses in ecology, a variety of ecology courses, additional course work in other areas (such as statistics), and by completing original research (MS Plan A, and PhD), or a major project (MS Plan B). A major advisor has primary responsibility for overseeing each student's program, and this responsibility is shared with the thesis committee. Acceptance into the GDPE requires acceptance as an advisee by one of the program's advising faculty members.

Program Goals

Ecology harnesses knowledge from biological, physical, and chemical sciences to study the interrelationships between organisms, groups of organisms, and the environment. During the past 2 decades, workers in fields as diverse as physiology, forestry, wildlife management, agronomy, animal behavior, pest control, epidemiology, microbiology, anthropology, and biogeochemistry found that many of the problems they address converge to a single, basic question: How do the biological, physical, and chemical components of environments interact? The key to understanding natural systems, or managing natural and agricultural ecosystems, lies in the threads of interactions that extend across many traditional disciplines. Current advances in ecology and resource management are synthesizing the knowledge and approaches of disciplines that usually are isolated from one another. Public concern focuses on environmental problems such as global climate change, balancing the use of resources such as wildlife or forests with conservation goals, managing the development of genetically engineered agricultural crops and predicting their effects on native biota, and assessing the effects of human activities on aquatic and terrestrial ecosystems. The need to train professionals who are able to address such problems in a synthetic manner is clear. Therefore, the primary goal of the Graduate Degree Program in Ecology (GDPE) at CSU is:

To provide advanced training in current ecological methods, theories, concepts, controversies and applications by drawing together individuals and synthesizing knowledge from a wide variety of traditional disciplinary areas of science.

Students gain depth in modern concepts and applications of ecology as they develop specialized skills within a certain field of ecology. The focus of the program is thus at right angles, so to speak, to those of traditional departmental graduate programs. Whereas students in a department are usually trained with a particular disciplinary orientation, students participating in the Graduate Degree Program in Ecology are educated from the outset with an emphasis on the ways in which knowledge from a variety of disciplines can be brought together in novel ways to address applied or basic problems. The program, therefore, is directed toward students seeking such a synthetic, interdisciplinary focus.

Nature of the Program

Colorado State University offers outstanding opportunities for graduate study in basic and applied aspects of ecology. The program seeks to promote, through formal and informal activities, interaction among students and faculty members across campus and ecologists from the many federal and state agencies in the Fort Collins area. The GDPE currently has faculty members in the Departments of Agricultural and Resource Economics, Anthropology, Bioagricultural Sciences and Pest Management (formerly Entomology, Plant Pathology, Weed Science), Biology (both Botany and Zoology sections), Chemistry, Earth Resources, Environmental Health, Fishery and Wildlife Biology, Forest Sciences, Microbiology, Natural Resource Recreation and Tourism, Radiological Health Sciences, Rangeland Ecosystem Science, and Soil and Crop Sciences, as well as in the Natural Resource Ecology Laboratory (NREL), an interdisciplinary research unit on campus.

Resources and Facilities

Fort Collins is located at the junction of the western edge of the Great Plains and the foothills of the eastern slope of the Rocky Mountains. A wide variety of research sites are readily accessible. Nearby major habitat types include: shortgrass and mixed-grass prairies; sagebrush plains; mountain meadows, forests, lakes, and streams; southwestern deserts; alpine tundra; and a wide range of irrigated and dryland agroecosystems.

Colorado State University is rich in research laboratories and support services. The Natural Resource Ecology Laboratory is an international center for ecosystem analysis. Both the University Insect Collection and the Herbarium contain large reference collections. The Central Animal Care Facility has conventional and restricted containment facilities, as well as controlled environments, surgical facilities, and animal transport capabilities. Computing facilities at CSU are fully networked, offering access from PCS to supercomputers. The Statistics Laboratory provides consultation for all statistical software supported by the Computer Center. The University also operates several microcomputer laboratories in colleges and departments contain a wide range of hardware and software products. GDPE students are authorized to use the computing facilities of their advisor's college and department.

Colorado State University maintains a number of field sites. The Colorado State Forest Service manages the 29,000 ha State Forest located 130 km west of Fort Collins and the State Forest Service Nursery at the Colorado State Foothills campus. The Agronomy Research Center provides over 80 ha of farmland. The Experiment Station maintains nine Agricultural Research Centers located throughout the state for research on agronomic and horticultural crops, land management, range ecology, and livestock production. Pingree Park is the mountain campus of Colorado State and is located 90 km northwest of Fort Collins adjacent to the Roosevelt National Forest and Rocky Mountain National Park. Facilities include laboratories, classrooms, cabins, dining hall, and a conference center. The Maxwell Range, a 4,850 ha tract 30 km north of Fort Collins, is ideal for range ecology research.

Many federal and state lands are readily accessible and used extensively by GDPE students and faculty. Nearby Rocky Mountain National Park not only provides a vast recreation resource for the public, but also provides designated natural areas for research purposes. The 6,000 ha Central Plains Experimental Range, a Long Term Ecological Research Site administered through the National Science Foundation and the Agricultural Research Service, is just 60 km northeast of Colorado State. Located on the west side of the Continental Divide is the USFS Fraser Experimental Forest, primarily subalpine habitat permanently maintained for basic and applied research in the areas of timber, watershed, and wildlife management. The U.S. Forest Service also maintains the Manitou Experimental Forest (primarily ponderosa-bunchgrass) near Colorado Springs. Other federal land units in the area include the Arapaho and Roosevelt National Forest, which contain over 500,000 ha of mountain forest and rangeland between Denver and Wyoming. Colorado Division of Parks and Outdoor Recreation, through its Northern Regional Office in Fort Collins, administers six state parks (34,000 ha), areas valuable for wildlife and recreation-related research. Several nearby federal and state agencies have traditionally maintained cooperative research ties with Colorado State. These include: USDA (Agricultural Research Service, Economic Research Service, Forest Service); U.S. Department of Interior (National Biological Survey, Cooperative Wildlife and Fishery Units, National Park Service); Center for Disease Control; Colorado Division of Wildlife; and Colorado State Forest Service.

Admission Standards

Graduate student advising requires substantial commitments of faculty time and effort, so admission to the program is unfortunately limited. We enroll about 15 students each year, from a pool of applicants that exceeds 180. Admission requirements include a bachelor's degree in any of the agricultural, anthropological, biological, biochemical, mathematical, or physical sciences from an accredited college or university, and a minimum undergraduate GPA of 3.0 (the actual average of admitted students is 3.5). The general test (verbal, quantitative and analytical writing) of the Graduate Record Examination (GRE) is also required, with a preferred minimum average percentile score of 75. Consult the Colorado State University Graduate and Professional Bulletin for full details on graduate admissions. This is especially important if you seek a

departmentally funded teaching assistantship position. Applicants should demonstrate a mastery of fundamental concepts and knowledge in areas relevant to ecology. Suggested background for admission includes: chemistry (including organic- or biochemistry), physics, biology, mathematics (calculus), and ecology. Some applicants may be accepted without the full list of prerequisite courses; in particular, applicants with strong backgrounds in social sciences may be admitted to the program without the full complement of courses listed above.

Applications are reviewed by the GDPE Academic Committee. The committee identifies the potentially acceptable applicants and notifies prospective advisors (identified by the applicant or by the committee); **final acceptance is based on acceptance as an advisee by a member of the advising faculty of GDPE.** Applicants are encouraged to correspond directly with prospective faculty advisors during the application process.

Transfer Credits

Students with graduate experience at another university may transfer graduate credits with the approval of the adviser, graduate committee, and Graduate School (the maximum is 6 credits for an MS program, and 10 credits for a PhD program). Each transfer case is considered individually. Students with a MS degree from an accredited university may be exempted from up to 30 of these 72 hours with no explicit listing of transfer courses.

Program of Study

The advisor must be a member of the advising faculty of the GDPE faculty. All faculty members with an academic appointment in a CSU department may serve as co-advisors and graduate committee members. All members of the student's committee must maintain a current appointment with CSU in order to continue to serve as a voting member of the committee. For the MS degree, the student's graduate committee must include at least two members of the GDPE faculty (including the advisor) plus one outside member. The outside member represents Colorado State University, ensuring that CSU's expectations are met, and that the student's needs are being met by GDPE. For these reasons, the outside member must be from a different college than the major advisor, and must be a regular faculty member. The committee for PhD candidates includes a minimum of three members of the program faculty (including the advisor) and one outside member. CSU allows only CSU faculty (which includes affiliate faculty) to be voting members of students committees; scientists without an appointment at CSU can be non-voting members only. The Director of the GDPE serves as an *ex officio* member of all graduate committees. Student offices are in the department of their advisors. Advisors are responsible for allocating resources such as office space, mailboxes, etc.

The student, advisor, and committee collaborate to develop a program of study and are jointly responsible for monitoring the progress toward completion. Each student's graduate committee is also responsible for determining whether satisfactory progress is being made toward completion of the degree.

For the Master's degree, 30 hours of graduate credits are required (up to 6 hours may be transferred from other institutions), with 16 hours in 500- or 600-level courses, and 12 of these in regular courses (a "regular" course has a number ≥ 500 and < 580 , or ≥ 600 and < 680). Colorado State University offers both thesis and non-thesis tracks for obtaining MS degrees, at the option of each student and her/his committee. All MS students take a qualifying/comprehensive examination. The exam should generally be taken at least one semester before the final exam (thesis defense). Students may pass the exam, may pass but be required to take additional course work, or may fail. Failed examinations may be retaken once, at least one semester before the final examination. The examination evaluates the student's breadth and depth of knowledge in basic ecology and other disciplines related to the student's interdisciplinary focus. The examination may have oral or written components, and are administered each student's committee. Students should check with committee members well in advance of the exam date to discuss expectations for the exam.

The PhD degree requires a minimum of 72 hours. Up to 10 credits from graduate work can be transferred into a PhD program for students without an MS degree. Students with MS degrees may be credited with 30 hours toward this 72-hour requirement, regardless of the actual credits involved in the MS program. At least 21 hours of credit in 500+ level courses is required. Regulations regarding the distribution and sources of these credits are detailed in the Colorado State University Graduate and Professional Bulletin.

The PhD preliminary examination determines if a student is qualified to continue toward the doctorate in ecology. This determination is based on an assessment of the student's depth of knowledge in a particular area of ecology and closely related areas; the breadth of knowledge of other areas of ecology and relevant disciplines; and especially, the student's ability to integrate important components of ecological systems to develop well-synthesized ideas. The preliminary examination for the PhD follows the procedures described in the Graduate and Professional Bulletin, and includes both written and oral portions. The written exam is usually taken over a period of 3 or 4 days, followed within 10 days by the oral examination. The form and focus of the preliminary examination are determined by the student's graduate committee, and this information should be

discussed well in advance of the scheduled examination date. Each student must present a formal research proposal prior to embarking on thesis or dissertation research. This proposal is submitted to the student's graduate committee for approval. The Final Examination for the MS and PhD degrees include a formal oral presentation of the research findings. This seminar and examination is open to all faculty, students, and the academic community.

Summary of the Tasks and Timing for GDPE Programs

Step	Date
Selection of Graduate Committee	End of second semester
Filing of Program of Study (GS-6)	End of second semester
Qualifying/Comprehensive exam (MS; report form available from GDPE office)	At least 1 semester before final exam
Report of PhD Preliminary Exam (GS-16)	Within 2 working days of exam completion
Application for graduation (GS-25) and diploma name form (GS-25a)	By the 6th week of the final term
Thesis to committee (<i>after</i> necessary revisions with advisor)	Two weeks before defense
Report of final examination (GS-24)	Two working days after exam completion

Financial Aid

Graduate Teaching Assistantships and Research Assistantships are available through individual departments and faculty members' research activities. **NOTE:** In order to be considered for a teaching assistantship in the Department of Biology you **MUST** take the Biology subject section of the GRE.

Curriculum

The core is comprised of graduate-level ecology courses and seminars offered through the program with an EY designation. These basic requirements are designed to provide all students with a rigorous exposure to current activities and thinking over the breadth of subdisciplines in ecology, and are required of all students. The cafeteria series of graduate ecology courses are supplemented with advanced course work in ecology and related classes drawn from a wide variety of departmental offerings. This approach ensures that students obtain a broad exposure to a diversity of approaches to ecology, while permitting them to tailor a program to their specific interests. No specific distribution of ecology courses is required by GDPE; the appropriate course work is determined by the student, advisor, and committee.

2006-2007 CAFETERIA COURSES					
COURSE	SEM	CAFETERIA COURSES	MS CREDITS	PHD CREDITS	Instructor
EY505	F	Required Foundations of Ecology	2	2	Knapp
EY600	F	Group A Organism/Population Population and Community Ecology	3	3 to 6 (total of A+B must be > 9)	Fausch
BZ578	F	Genetics of Natural Population			Fausch
BZ530	S	Ecological Plant Morphology			
BZ535	S	Behavioral Ecology			
BZ548	F	Theory of Population and Evolutionary Ecology			Webb
BZ555	F	Reproductive Biol. of Higher Plants			
EN570	F	Chemical Ecology			
FW622	S	Wildlife Population Dynamics			
FW544	S	Ecotoxicology			
H581	F	Plant-Water Relations/Water Stress Physiology			
EY581	F	Group B Community/Ecosystem Ecosystem Ecology	3	3 to 6 (total of A+B must be > 9)	Burke/Lauenroth
EY600*	F	Population and Community Ecology			Fausch
EY620	F	Applications in Landscape Ecology			Noon
BZ561	F	Landscape Ecology			
FW555	F	Conservation Biology			
FW540	S	Fisheries Ecology			
F624	S	Fire Ecology			
NR660	S	Biogeochemical Cycling			
RS630	F	Ecology of Grassl. and Shrublands			
RS578	S	Ecology of Disturbed Lands			
RS651	F	Primary Production and Decomp			
AT6XX		Global Carbon Cycle			
BZ548	F	Theory of Population and Evolutionary Ecology	6	9	Webb
ST511	F	Statistics 511			
ST 512	S	Statistics 512			
ST 544	S	Statistics 544			
NR523/ST523	S	Quantitative Spatial Statistics			
FW663	S	Sampling and An. of Vert. Pop			
NR575	F	Systems Ecology			
500+		GIS and remote sensing -- any course 500+			
EY571.001-2	S	Distinguished Ecologist Lecture Series	2	2	Stohlgren
EY592 V	F, S	Interdisciplinary Seminars in Ecology	1	2	Various
EY693	S	Research Seminar	1	1	Binkley/Knapp

*EY600 can be used to meet either Group A or B, but not both.

Ecology-Related Classes - Listed by Departments

Ecology

EY 571	1-2	Advanced Topics in Ecology
EY 592 V	1-3	Interdisciplinary Seminar in Ecology (different topics offered each semester)

Forest Sciences

F 624	3	Fire Ecology
F 625	3	Ecology of Forest Production

Food Science and Human Nutrition

FN 550	3	Advanced Nutritional Science I
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Fishery & Wildlife Biology

FW 400	3	Fish Ecology
FW 401	3	Fishery Science
FW 474	3	Wildlife Ecology
FW 540	3	Fisheries Ecology
FW 544	3	Ecotoxicology
FW 551	2-3	Design of Fish & Wildlife Studies
FW 555	3	Conservation Biology
FW 662	3	Wildlife Population Dynamics
FW 663	5	Sampling and Analysis of Vertebrate Populations
FW 677	3	Wildlife Habitat Management

Horticulture

H 675	3	Plant Stress Physiology
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Landscape Architecture

LA 445	3	Methods of Landscape Analysis
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Microbiology

MB 432	4	Aquatic Microbiology
MB 624	2	Microbial Ecology

Natural Resources

NR 422	4	GIS Applications in Natural Resource Management
NR 440	3	Land Use Planning
NR 503	3	Remote Sensing for Resource Management
NR 504	4	Computer Analysis of Remote Sensing Data
NR 505	4	GIS Concepts
NR 506	4	GIS Methods for Resource Management
NR 520	4	Wilderness Management
NR 521	2	Natural Resource Administration
NR 525	3	World Natural Resources
NR 575	4	Systems Ecology
NR 621	3	Design of GIS
NR 622	3	Analysis of Environmental Impact

NR 660	3	Biogeochemical Cycling in Ecosystems
NR 676	4	Ecological Models
NR 793	1	Remote Sensing and GIS Seminar

Philosophy

PL 545	3	Concept of Natural Value
PL 550	3	Ethics and International Development

Political Science

PO 670	3	Politics of Growth and the Environment
PO 709	3	Environmental Politics in the US
PO 759	3	Environmental Policy and Administration

Radiological Health Sciences

R 563	2	Environmental Contaminant Modeling I
R 570	2	Radioecology
R 671	1	Experimental Radioecology
R 765	1	Environmental Contaminant Modeling II

Rangeland Ecosystem Science

RS 478	3	Restoration Ecology
RS 531	3	World Grassland Ecogeography
RS 578	3	Ecology of Disturbed Lands
RS 630	3	Ecology of Grasslands and Shrublands
RS 630	3	Ecology of Grasslands and Shrublands
RS 640	3	Vegetation-Environment Analysis
RS 651	4	Primary Production and Decomposition
RS 652	4	Secondary Prod. in Rangeland Ecosystems

Soil and Crop Sciences

SC 440	3	Soil Genesis and Survey
SC 442	3	Forest and Rangeland Soils
SC 455	3	Soil Microbiology
SC 467	3	Soil Chemistry
SC 475	3	Tropical Soils, Crops, & Farming Systems
SC 522	3	Plant Canopy Meteorology
SC 540	3	Soil-Plant-Nutrient Relationships
SC 550	3	Advanced Soil Genesis
SC 560	3	Chemical Equilibria in Soils
SC 755	3	Advanced Soil Microbiology

Statistics

ST 511	3	Design and Data Analysis for Researchers I
ST 512	3	Design and Data Analysis for Researchers II
ST 523	3	Quantitative Spatial Analysis

Curricular Track Options

One of the strengths of the Graduate Degree Program in Ecology is its flexibility: students with particular interests in ecology build on the foundation of core courses to achieve the interdisciplinary training. Because of the special concentrations of ecological expertise in several areas at Colorado State University and because of the contemporary importance of these areas, several curricular options or "tracks" are suggested to guide development of student programs. Seven examples of curricular options are: Conservation Biology, Global Change, Human Ecology, Landscape Ecology, Restoration Ecology, Ecosystem Management, and Ecological Risk Assessment and Management (ERAM). These tracks are informal and serve only as guides for students to modify.

Sample Curriculum - Conservation Biology Option

A. Central Courses:

EA 540	3	Economics of Natural Resources
FW 555	3	Conservation Biology
FW 662	3	Wildlife Population Dynamics
PL 545	3	Concept of Natural Value
PO 670	3	Politics of Growth and the Environment

B. Other Relevant Courses:

BZ 561	3	Landscape Ecology
BZ 579	4	Laboratory in Population Genetics
EA 541	3	Environmental Economics
FW 540	3	Fisheries Ecology
FW 663	5	Sampling and Analysis of Vertebrate Populations
FW 677	3	Wildlife Habitat Management
RS 478	3	Restoration Ecology
RS 578	3	Ecology of Disturbed Lands

Sample Curriculum - Global Change Option

A. Central Courses:

AT 606	2	Climatology
CE 524	4	Modeling Watershed Hydrology
NR 525	3	World Natural Resources
NR 660	3	Biogeochemical Cycling in Ecosystems
NR 676	4	Ecological Models
RS 531	3	World Grassland Ecogeography
RS 651	4	Primary Production and Decomposition
SC 560	3	Chemical Equilibria in Soils

B. Other Relevant Courses:

AT 555	3	Air Pollution
AT 604	2	Atmospheric Modeling
AT 621	2	Atmospheric Chemistry
AT 652	2	Atmospheric Remote Sensing
AT 711	2	Micrometeorology
AT 722	3	Atmospheric Radiation and Energetics
CE 520	3	Physical Hydrology
CE 722	3	Large Scale Hydrology
ER 652	3	Fluvial Geomorphology
F 625	3	Ecology of Forest Production
MB 624	2	Microbial Ecology
NR 575	4	Systems Ecology
NR 793	1	Remote Sensing and GIS Seminar
RS 630	3	Ecology of Grasslands and Shrublands
SC 442	3	Forest and Rangeland Soils
SC 522	3	Plant Canopy Meteorology
SC 540	3	Soil-Plant-Nutrient Relationships

Sample Curriculum - Human Ecology Option

A. Central Courses:

AP 530	3	Humans in Ecosystems
AP 543	3	Method and Theory in Ethnology
EA 540	3	Economics of Natural Resources
EA 660	3	Economics of Agricultural Development
NR 525	3	World Natural Resources

NR 793	1	Remote Sensing and GIS Seminar
PL 545	3	Concept of Natural Value

B. Other Relevant Courses:

AP 440	3	Theory in Cultural Anthropology
AP 445	3	Great Plains Archaeology
EA 541	3	Environmental Economics
FN 550	3	Advanced Nutritional Science I
GR 422	3	Traditional Farming Systems
NR 622	3	Analysis of Environmental Impact
PO 670	3	Politics of Growth and the Environment
PO 709	3	Environmental Politics in the U.S.
SC 475	3	Tropical Soils, Crops, & Farming Systems

Ecology Electives	3-6
EY 798 or 799	7-11

Sample Curriculum - Landscape Ecology Option

A. Central Courses:

BZ 581	3	Landscape Ecology
NR 503	3	Remote Sensing for Resource Management
NR 504	4	Computer Analysis of Remote Sensing Data
NR 505	4	Concepts in GIS
NR 676	4	Ecological Models
RS 578	3	Ecology of Disturbed Lands
ST 523	3	Quantitative Spatial Analysis

B. Other Relevant Courses:

AP 530	3	Humans in Ecosystems
ER 454	4	Geomorphology
F 624	3	Fire Ecology
FW 540	3	Fisheries Ecology
FW 555	3	Conservation Biology
FW 677	3	Wildlife Habitat Management
LA 445	3	Methods of Landscape Analysis
NR 440	3	Land Use Planning
NR 422	4	GIS App. in Natural Resource Management
RS 478	3	Restoration Ecology
SC 440	3	Soil Genesis and Survey

Sample Curriculum - Restoration Ecology Option

A. Central Courses:

ER 652	3	Fluvial Geomorphology
FW 544	3	Ecotoxicology
RS 478	3	Restoration Ecology
RS 578	3	Ecology of Disturbed Lands
SC 540	3	Soil-Plant-Nutrient Relationships

B. Other Relevant Courses:

CB 462	3	Environmental Law
ER 712	3	Watershed Systems
ER 714	3	Water Quality for Wildland Managers
H 675	3	Plant Stress Physiology
NR 622	3	Analysis of Environmental Impacts
NR 660	3	Biogeochemical Cycling in Ecosystems
RS 630	3	Ecology of Grasslands and Shrublands

SC 467	3	Soil Chemistry
SC 550	3	Advanced Soil Genesis

Sample Curriculum - Ecosystem Management Option

A. Central Courses:

CE 546	3	Water Resource Systems Analysis
EA 540	3	Economics of Natural Resources
EA 660	3	Economics of Agricultural Development
ER 652	3	Fluvial Geomorphology
LA 445	3	Methods of Landscape Analysis
NR 525	3	World Natural Resources
NR 660	3	Biogeochemical Cycling in Ecosystems
SC 475	3	Tropical Soils, Crops, & Farming Systems

B. Other Relevant Courses:

AT 555	3	Air Pollution
CE 524	4	Modeling Watershed Hydrology
EA 541	3	Environmental Economics
EN 556	3	Biological Control of Plant Pests
F 625	3	Ecology of Forest Production
FW 540	3	Fisheries Ecology
FW 555	3	Conservation Biology
GS 670	3	Interdisciplinary Agricultural Development
MB 624	2	Microbial Ecology
NR 520	4	Wilderness Management
NR 521	2	Natural Resource Administration
NR 575	4	Systems Ecology
NR 622	3	Analysis of Environmental Impact
NR 676	4	Ecological Models
NR 793	1	Remote Sensing and GIS Seminar
PL 550	3	Ethics and International Development
PO 670	3	Politics of Growth and the Environment
PO 709	3	Environmental Politics in the U.S.
PO 759	3	Environmental Policy and Administration
RS 578	3	Ecology of Disturbed Lands
RS 652	4	Secondary Production in Rangeland Ecosystems

Curriculum - Ecological Risk Assessment and Management (ERAM)

A. Ecology and Physical Sciences:

EY 500 A-B	4	Organism/Population Ecology
EY 501 A-B	4	Community/Ecosystem Ecology
NR 660	3	Biogeochemical Cycling in Ecosystems
FW 544	3	Ecotoxicology
R 570	2	Radioecology
RS 578	3	Ecology of Disturbed Lands

B. Statistics and Modeling:

R 563	2	Environmental Contaminant Modeling I
R 765	1	Environmental Contaminant Modeling II
ST 511	3	Design and Data Analysis for Researchers I
ST 512	3	Design and Data Analysis for Researchers II

C. Administration:

CB 462	3	Environmental Law
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D. Seminar and Practicum:

EY 571	2	Advanced Topics in Ecology
EY 592	1	Interdisciplinary Seminar in Ecology