Natural Resources

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School of Natural Resources

The School of Natural Resources is one of six Divisions in the College of Agriculture, Food and Natural Resources. It is Missouri’s and the Midwest’s only school with comprehensive academic and research programs focused on biological, physical, and social aspects of natural resources science and management. The School encompasses the fields of: Environmental Sciences; Natural Resource Science and Management; and Parks, Recreation and Sport. The School applies an integrated, scientific approach to develop sustainable solutions to environmental challenges and to train the next generation of natural resources professionals and leaders. This integrated approach results in creative course offerings, enhanced educational opportunities, stimulation of novel research, advanced understanding of natural systems, and expanded knowledge and management of human interactions with the environment. The School is housed in the Anheuser-Busch Natural Resources Building containing state-of-the-art teaching, research and outreach extension facilities.

Faculty

Faculty members within the School of Natural Resources have their appointments through the following degree programs: Environmental Sciences; Natural Resource Science and Management; and Parks, Recreation and Sport. Their faculty listing can be found on those degree pages.

Undergraduate

Admissions

In addition to requirements listed below, students admitted to the University of Missouri may enter The School of Natural Resources as freshmen or as transfer students.

Transfer Students

Previous college work is carefully evaluated by The School of Natural Resources. Courses are readily accepted if they are satisfactory substitutes for required University of Missouri courses. Lists of acceptable substitute courses offered at many other institutions are maintained and are available to prospective transfer students on request.

Major Program Requirements

Students must meet all emphasis, major, degree, department, college and university graduation requirements (http://catalog.missouri.edu/academicdegreerequirements/universityrequirements), including the university general education requirements (http://catalog.missouri.edu/academicdegreerequirements/generaleducationrequirements). See the appropriate sections of this catalog.

Academic Assessment

Credits by Examination

A total of 21 credits in CLEP (College Level Entrance Program) is accepted in the following areas: English, mathematics, social sciences and humanities. The school does not accept natural science CLEP credit.

Student Services

Advising

Personalized advisement and counseling is available from the school’s faculty members. An open-door policy by advisors is emphasized and the school is noted for excellent student/faculty relations. Undergraduate advisement in The School of Natural Resources (SNR) is undertaken by those faculty and staff who advise with the attitude of fostering academic and professional development and success. The faculty members recognize the importance of establishing a trust relationship with students that will extend through their academic years at MU into their careers.

Career Placement

Students in The School of Natural Resources are provided various types of employment assistance through the College of Agriculture, Food and Natural Resources Career Services Office (2-64 Agriculture Building). Resource materials on potential employers are available for student use. Instructions regarding federal, state and industrial employment procedures and assistance in the preparation of résumés and applications also are available. Notices of available positions are posted, and interviews are arranged with visiting organizations. Employment assistance also is given to alumni of the school on request.

Freshman Interest Groups

Freshman Interest Groups (FIGs) are sponsored by the school in the areas of atmospheric sciences (“Storm Chasers”), natural resources and sport management. A learning community is also sponsored, comprised of members of the two FIGs and other students who live on the same dormitory floor. The FIG experience promotes a sense of community among students that increases the quality of all aspects of university life for incoming students.

Transfer Student Interest Groups

TRIGs, or Transfer Interest Groups, involve activities that are specifically designed to help transfer students make a smooth transition to the MU campus. The School of Natural Resources TRIG is composed of transfer students with common interests and majors. In addition to other activities, members of each TRIG take a 1 credit hour proseminar together during their first semester at MU. You do not need to live on campus to participate in a TRIG program. TRIGs are only open to transfer students who have completed 24 or more hours at their previous institution. There is no additional cost for participating in a TRIG, and they are a great way to get to know campus and meet other students who are also making the same transition. TRIGs are available only for students planning to start at MU in the fall term.
Graduate

- MS in Natural Resources (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/ms-naturalresources)
  - with emphasis in Agroforestry (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/ms-naturalresourcesagroforestryemphasis)
  - with emphasis in Fisheries & Wildlife Sciences (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/ms-fisheries-wildlife-sciences)
  - with emphasis in Forestry (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/ms-forestry)
  - with emphasis in Human Dimensions of Natural Resources (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/ms-naturalresourceshumandimensionsofnaturalresources)
  - with emphasis in Parks, Recreation and Tourism (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/ms-parks-recreation-tourism)
  - with emphasis in Soil, Environmental and Atmospheric Sciences (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/ms-soil-environmental-atmospheric-sciences)
  - with emphasis in Water Resources (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/ms-naturalresourceswaterresourcessemphasis)
- PhD in Natural Resources (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/phd-naturalresources)
  - with emphasis in Fisheries & Wildlife Sciences (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/phd-fisheries-wildlife-sciences)
  - with emphasis in Forestry (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/phd-forestry)
  - with emphasis in Human Dimensions of Natural Resources (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/phd-naturalresourceshumandimensionsofnaturalresources)
  - with emphasis in Soil, Environmental and Atmospheric Sciences (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/phd-soil-environmental-atmospheric-sciences)
  - with emphasis in Water Resources (http://catalog.missouri.edu/undergraduate/collegeofagriculturefoodandnaturalresources/naturalresources/phd-naturalresourceswaterresourcessemphasis)

NAT_R 1040: Conservation Studies
A one-week field experience in natural resource management issues-soil and water conservation, air pollution, fish and wildlife habitat requirements, importance of forest ecosystems. Limited to high school students who have completed their junior year and taken the PSAT or equivalent. Graded on S/U basis only.
Credit Hours: 1

NAT_R 1060: Ecology and Conservation of Natural Resources
Introduction to the principles of resource and conservation describing the foundation of the variety of natural resources and conservation practices used to protect and maintain these resources.
Credit Hours: 3

NAT_R 1070: Ecology and Renewable Resource Management
Introduction to ecological principles and their relationship to resource use and management.
Credit Hours: 3
Prerequisites: restricted to Natural Resources majors

NAT_R 2002: Topics in Natural Resources - Biological/Physical/Mathematical
Organized study of selected topics. Subjects and credit may vary from semester to semester.
Credit Hour: 1-99

NAT_R 2004: Topics in Natural Resources - Social Science
Organized study of selected topics. Subjects and credit may vary from semester to semester.
Credit Hour: 1-99

NAT_R 2080: Outdoor Recreation Consortium
Outdoor Recreation Consortium is a collaborative course taught by MU, North Carolina State University, Penn State University, East Carolina University, Texas A&M University and Western Illinois University. The course uses Great Smoky Mountains National Park as a case study for understanding the relationship between ecosystem management, natural resource management, tourism, and outdoor recreation. This course is based around a one week trip to the Smokies. Graded on A-F basis only.
Credit Hours: 2
Prerequisites: NAT_R 1070 or P_R_TR 2111 or ENV_SC 1100 and permission of instructor

NAT_R 2160: Issues in Natural Resources and the Environment
This course provides an introduction to ecological and environmental challenges in natural resource management in our rapidly changing world. Topical discussions will provide students with informed perspectives of several contemporary issues that affect the sustainability of our natural resources.
Credit Hours: 3
Recommended: This course is recommended as an introductory course for non-science majors
NAT_R 3001: Topics in Natural Resources  
Organized study of selected topics. Subjects may vary from semester to semester.  
Credit Hour: 1-99  

NAT_R 3110: Natural Resource Biometrics  
Sampling methods and analysis as applied to a variety of natural resources, including fisheries, range, recreation, forests, water and wildlife.  
Credit Hours: 3  
Recommended: a course in Statistics  

NAT_R 3220: Public Relations for Natural Resource Managers  
Introduction to the practical nature of public relations for those entering natural resources careers, emphasis on communication with target audiences through news media, publications and exhibits.  
Credit Hours: 3  

NAT_R 3290: Hydrologic Measurement Techniques  
Students will be introduced to field methods and tools used by water resource and environmental science professionals. Students will sample and measure hydrologic and environmental variables, learn about data storage systems, and access and analyze data. Course may be repeated for credit. Graded on A-F basis only.  
Credit Hour: 1  
Prerequisites: MATH 1100 or permission of instructor  

NAT_R 3290W: Hydrologic Measurement Techniques - Writing Intensive  
Students will be introduced to field methods and tools used by water resource and environmental science professionals. Students will sample and measure hydrologic and environmental variables, learn about data storage systems, and access and analyze data. Course may be repeated for credit. Graded on A-F basis only.  
Credit Hour: 1  
Prerequisites: MATH 1100 or permission of instructor  

NAT_R 4000: Problems in Natural Resources  
Problems in Natural Resources  
Credit Hour: 1-99  

NAT_R 4001: Topics in Natural Resources  
Organized study of selected topics. Subjects may vary from semester to semester.  
Credit Hour: 1-99  

NAT_R 4024: Foundations of Environmental Education  
(same as ENV_SC 4024; cross-leveled with NAT_R 7024). This course provides a theoretical foundation to environmental education (EE). The purpose of this course is to develop the knowledge and skills for developing quality, age-appropriate EE for students in both formal and non-formal education setting. The emphasis is on EE curriculum materials, resources, and programs that can be used with students in settings at classrooms, nature centers, museums, and parks. This course involves training in the Missouri Department of Conservation Discover Nature School educational materials, and in observing and teaching EE lessons in a local nature center. Graded on A-F basis only.  
Credit Hours: 3  
Prerequisites: BIO_SC 1010 or ENV_SC 1100 or NAT_R 1060 or NAT_R 1070 or NAT_R 2160 or Instructor's consent  

NAT_R 4030: Hydrologic and Water Quality Modeling  
(same as ENV_SC 4320). Introduction to models for simulating hydrologic and water quality processes. Emphasis is placed on watersheds to provide experience with the use of simulation models for natural resource decision making.  
Credit Hours: 3  
Prerequisites: ENV_SC 1100 or SOIL 2100  

NAT_R 4325: Introduction to Geographic Information Systems  
(cross-leveled with NAT_R 7325). The course will cover basic theoretical and technical issues in GIS, discuss processing geographic information for research and application, emphasis on the nature of spatial information, data models, input, manipulation and storage, and spatial analytic techniques.  
Credit Hours: 3  
Prerequisites: NAT_R 1070 or GEOG 2840; NAT_R 1080 and NAT_R 1090; instructor's consent  

NAT_R 4353: Natural Resource Policy/Administration  
Principles of policy formation and analysis; relationship of organizational goals to structure, planning and budgeting. Historical background of present natural resource policies; examines current policy issues.  
Credit Hours: 3  
Prerequisites: senior standing or instructor's consent  

NAT_R 4365: GIS Applications  
Introduces logical thinking and techniques in applying GIS to practical problems. Covers general GIS functionalities, Arc View Spatial Analyst including georeference, terrain analysis, hydrological analysis, grid, and remote sensing image processing.  
Credit Hours: 3  
Prerequisites: GEOG 3040, NAT_R 1080 and NAT_R 1090  

NAT_R 4385: Landscape Ecology and GIS Analysis I  
(same as GEOG 4810). Examination of the landscape-scale approach to biodiversity, ecosystem dynamics, and habitat management. Particular emphasis on the use of Geographic Information Systems to analyze the spatial dimension of ecological patterns and processes.  
Credit Hours: 3  
Prerequisites: GEOG 3040  

NAT_R 4940: Natural Resources Internship  
Supervised professional experience with an approved public or private organization. May be repeated for credit. Graded on S/U basis only.  
Credit Hour: 1-12  
Prerequisites: School of Natural Resources majors only, instructor's consent
NAT_R 4970: Resource Practicum in Natural Resources
Multidisciplinary planning of a natural resource management program.

Credit Hours: 3
Prerequisites: School of Natural Resources majors only and senior standing

NAT_R 7001: Topics in Natural Resources
Organized study of selected topics. Subjects may vary from semester to semester.

Credit Hour: 1-99

NAT_R 7024: Foundations of Environmental Education
(cross-leveled with NAT_R 4024, ENV_SC 4024). This course provides a theoretical foundation to environmental education (EE). The purpose of this course is to develop the knowledge and skills for developing quality, age-appropriate EE for students in both formal and non-formal education setting. The emphasis is on EE curriculum materials, resources, and programs that can be used with students in settings at classrooms, nature centers, museums, and parks. This course involves training in the Missouri Department of Conservation Discover Nature School educational materials, and in observing and teaching EE lessons in a local nature center. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: NAT_R 1080 and NAT_R 1090 and SOIL 2100 or equivalent

NAT_R 7320: Hydrologic and Water Quality Modeling
(same as ENV_SC 7320). Introduction to models for simulating hydrologic and water quality processes. Emphasis is placed on Missouri watersheds to provide experience with the use of simulation models for natural resource decision making.

Credit Hours: 3
Prerequisites: NAT_R 1080 and NAT_R 1090 and SOIL 2100 or equivalent

NAT_R 7325: Introduction to Geographic Information Systems
(cross-leveled with NAT_R 4325). The course will cover basic theoretical and technical issues in GIS, discuss processing geographic information for research and application, emphasis on the nature of spatial information, data models, input, manipulation and storage, and spatial analytic techniques.

Credit Hours: 3
Prerequisites: NAT_R 1070 or GEOG 2840; NAT_R 1080 and NAT_R 1090; instructor's consent

NAT_R 7353: Natural Resource Policy/Administration
Principles of policy formation and analysis; relationship of organizational goals to structure, planning and budgeting. Historical background of present natural resource policies; examines current policy issues.

Credit Hours: 3
Prerequisites: instructor's consent

NAT_R 7365: GIS Applications
Introduces logical thinking and techniques in applying GIS to practical problems. Cover general GIS functionalities, Arc View Spatial Analyst including georeference, terrain analysis, hydrological analysis, grid, and remote sensing image processing.

Credit Hours: 3
Prerequisites: GEOG 3040, NAT_R 1080 and NAT_R 1090, or instructor's consent

NAT_R 7385: Landscape Ecology and GIS Analysis I
(same as GEOG 7810). Examination of the landscape-scale approach to biodiversity, ecosystem dynamics, and habitat management. Particular emphasis on the use of Geographic Information Systems to analyze the spatial dimension of ecological patterns and processes.

Credit Hours: 3
Prerequisites: GEOG 3040, or instructor's consent

NAT_R 8001: Topics in Natural Resources
Organized study of selected topics. Subjects may vary from semester to semester.

Credit Hour: 1-99

NAT_R 8050: Masters Non-Thesis Research in Natural Resources
Research credits associated with a non-thesis M.S. project. May be repeated for credit. Graded on S/U basis only.

Credit Hour: 1-10
Prerequisites: restricted to Masters students in the School of Natural Resources

NAT_R 8090: Master Thesis Research in Natural Resources
Research credits leading to M.Sc. thesis. May be repeated for credit. Graded on S/U basis only.

Credit Hour: 1-10
Prerequisites: Restricted to Masters students in the School of Natural Resources

NAT_R 8290: Hydrologic Measurement and Synthesis
Students are introduced to methods fundamental to measuring hydrologic processes, and assessing physical data, including field measurement, and data logging and acquisition information systems. Students will gain experience analyzing and synthesizing hydrologic data using tools commonly used by water resource professionals. May be repeated for credit. Graded on A-F basis only.

Credit Hours: 2
Prerequisites: MATH 1100, STAT 2530, PHYSCS 1210. If deficient in prerequisite courses, or unsure of qualification, contact instructor for consent

NAT_R 8395: Landscape Ecology and GIS Analysis II
(same as GEOG 8815). Provide students with principles and applications of landscape ecology and firm understandings of spatial analysis techniques using GIS. Discuss metrics for spatial pattern and models for landscape-scale dynamics.

Credit Hours: 3
Prerequisites: NAT_R 4365; FOREST 4320 or equivalent; basic statistics; instructor's consent
Recommended: GEOG 4810 or GEOG 7810
**NAT_R 8416: Applied Research Methodology**
Interrelated roles or logic, observation experiment in scientific method, research components, ethical aspects, scientific publication and communication, and research direction.

**Credit Hours:** 2  
**Prerequisites:** instructor's consent

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**NAT_R 8448: Society and Ecosystems Research Seminar**  
(same as AG_EC 8448 and RU_SOC 8448). This seminar, capstone for the Graduate Certificate Program in Society and Ecosystems, exposes students to interdisciplinary research on interactions between social, economic and ecological systems.

**Credit Hours:** 3

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**NAT_R 9001: Topics in Natural Resources**  
Organized study of selected topics. Subjects and topics may vary from semester to semester. Graded on S/U basis only.

**Credit Hour:** 1-10  
**Prerequisites:** instructor's consent. Restricted to School of Natural Resources Graduate Students

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**NAT_R 9087: Graduate Seminar in Natural Resources**  
Graduate seminar in Natural Resources. May be repeated for credit. Graded on S/U basis only. Prerequisites: restricted to PhD students in the School of Natural Resources

**Credit Hour:** 1-10

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**NAT_R 9090: Dissertation Research in Natural Resources**  
Research leading to a dissertation and Ph.D. in the School of Natural Resources. Graded on S/U basis only.

**Credit Hour:** 1-10  
**Prerequisites:** Restricted to PhD students in the School of Natural Resources

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**NAT_R 9490: Ecohydrology: Contemporary Topics**  
A series of discussions centered on primary literature within disciplines relevant to the participants. All Natural Resources disciplines are encouraged to participate (e.g., ecology, wildlife, fisheries, recreation/tourism, hydrology, atmospheric sciences, soils, etc.) with emphasis on interdisciplinary research (i.e. integrated natural, social and/or physical scientific research). May be repeated for credit. Graded on A-F basis only.

**Credit Hour:** 1