ECOLOGICAL DESIGN

OVERVIEW

Ecological Design is the process of integrating humans with the rest of nature in order to create a sustainable and desirable future. Ecological Design employs transdisciplinary integration, creative synthesis, and true participatory problem-solving to understand and resolve increasingly complex issues. The emphasis of the Certificate of Graduate Study in Ecological Design is on problem-based learning in ecology, engineering, natural resources, and community development. The approach is to develop applied and interdisciplinary solutions which integrate the ecological, social, economic, and built systems.

DEGREES

- Ecological Design CGS

Courses

NR 220. Landscape Ecology. 3 Credits.
The course examines the critical role of landscape pattern in determining ecological process and dynamics, as well as human-ecological interactions. Includes field labs. Prerequisites: NR 103 or BCOR 102; Senior/Graduate standing.

NR 228. Ecosystems Ecology. 3 Credits.
Examination of the structure and function of terrestrial ecosystems focusing on carbon and nutrient cycles. Laboratory sessions involve spatial modeling and data analysis. Prerequisites: CHEM 031, CHEM 032, NR 103, NR 143, NR 146, or Instructor permission. Cross-listed with: FOR 228.

NR 235. Legal Aspects Envir Planning. 3 Credits.
Comparison of environmental planning law at local, state, and national levels. Case studies in environmental and natural resources planning and land use controls. Pre/co-requisite: Senior Standing.

NR 238. Ecological Landscape Design. 4 Credits.
Studio course synthesizing work from fields of landscape ecology and landscape design, exploring ecological design alternatives at multiple scales, and developing multifunctional landscape solutions. Pre/co-requisites: minimum Junior standing, PSS 137 or one course in ecology plus one course in design or drawing. Cross-listed with: CDAE 238, ENVS 238, PSS 238.

NR 240. Park and Wilderness Mgmt. 3 Credits.
Cross-listed with PRT 240. History, philosophy, and management of wilderness, national parks, and related areas. Prerequisites: Junior/ Senior standing in Parks, Recreation and Tourism.

NR 242. Adv Geospatial Techniques. 1-3 Credits.
Advanced course encompassing a wide range of topics in GIS, remote sensing, GPS, modeling, and visualization designed to provide technical expertise in geospatial techniques. Prerequisites: Introductory GIS (NR 143 or GEOG 184 or NR 343) or remote sensing (NR 146 or GEOG 185) course as determined by Instructor.

NR 243. GIS Practicum. 3 Credits.
An applied course in geospatial technology with a focus on ESRI’s ArcGIS software suite. Prerequisite: NR 143/NR 343.

NR 245. Integrating GIS & Statistics. 3 Credits.
Advanced approaches in integrating Geographic Information Systems (GIS) and statistical methods to analyze quantitatively spatial patterns and relationships. Prerequisites: Senior/Graduate standing, one introductory GIS course, one introductory Statistics course.

NR 250. Limnology. 0 or 4 Credits.
Ecology of lakes and reservoirs, including their origin, physics, chemistry and biology, and the effects of anthropogenic perturbations. Field and laboratory experience. Prerequisites: One year Biology; one year Chemistry; ecology course.

NR 254. Adv Natural Resource Policy. 3 Credits.
Advanced seminar in natural resource policy, emphasizing current issues in forest policy. Prerequisite: Graduate or advanced undergraduate standing; Instructor permission.

NR 255. Field Mthds in Water Resources. 3 Credits.
Techniques used in field assessment of water quality in rivers and lakes. Case studies on the LaPlatte River and Lake Champlain. Sampling strategies, field measurements, and data evaluation. Extensive field work. Prerequisite: NR 102 or equivalent basic course in water.

NR 260. Wetlands Ecology & Mgmt. 3 Credits.
Structure, dynamics and values of natural and artificial wetlands; wetlands management and issues. Prerequisite: BIOL 001 and BIOL 002; an upper-level ecology course.

NR 262. Int’l Problems in NR Mgmt. 3 Credits.
Discussion of problems associated with the management of natural resources which have international implications. Topics may include deforestation, desertification, fisheries, wildlife, refuges, fuelwood, pollution. Prerequisite: Senior standing; permission.

NR 265. Environment & Human Behavior. 3 Credits.
Applies social psychological frameworks--attitudes, exchange theory, symbolic interaction, group processes, social cognition, discourse theory--to help understand environmentally related behaviors, conflict, and management. Prerequisite: Junior standing.

NR 268. Soil Ecology. 0 or 4 Credits.
Underlying concepts and theory of modern soil ecology will be reviewed including spatial and temporal distributions, sampling methods, biogeochemical cycles, and ecological functions of soil. Prerequisites: BCOR 102 or NR 103, PSS 161. Cross-listed with: PSS 268.

NR 270. Toxic&Hzrds Subst in Srf Water. 3 Credits.
The fate of toxic and hazardous pollutants, including trace elements and organics, in surface waters; effects on human health and aquatic biota. Prerequisite: BIOL 001, CHEM 023, CHEM 042; CHEM 102 or equivalent; Senior standing.
NR 275. NR Planning: Theory & Methods. 3 Credits.
Investigates theoretical development of natural resource planning. Studies planning methods appropriate to protection and use of scenic, recreational, forest, agriculture, and historic resources and ecologically sensitive areas. Prerequisite: Senior standing.

NR 276. Water Quality Anlys & Interp. 0 or 3 Credits.
Selected aspects of water chemistry and bioassay as related to surface and ground waters. Laboratory analysis of water quality parameters and data interpretation. Prerequisite: One course in Chemistry, calculus, and Statistics; Senior standing.

NR 279. Watershed Management Hydrology. 0 or 3 Credits.
Fundamental elements of hydrology and contaminant transport in watersheds. Application of dynamic simulation techniques. Discussion of new technologies for watershed management. Prerequisite: NR 170 or equivalent or as a co-requisite; NR 020, PHYS 011, CHEM 023, CHEM 026 or equivalent; Senior standing.

NR 280. Stream Ecology. 0 or 4 Credits.
Ecology of streams including hydrodynamics, morphology, sediment transport, chemistry, biology and human impacts. Field and laboratory experience. Prerequisites: One year Biology; one year Chemistry; ecology course.

NR 285. Advanced Special Topics. 1-6 Credits.
Advanced special topics in natural resource planning beyond the scope of existing formal courses. Prerequisite: Graduate/Senior standing; Instructor permission.

NR 288. Ecol Design & Living Technol. 3 Credits.
The course explores the potential for ecological design to shape a sustainable future. It analyzes living technologies for food production, waste management and environmental restoration. Pre/co-requisites: Junior/Senior standing, background in ecology/systems theory.

NR 289. Advanced Ecological Design. 3 Credits.
A problem-based, cross-disciplinary design course in which existing conditions are integrated with the redesign of place and system in alignment with ecological design principles.

NR 306. Envisioning a Sust Future. 2 Credits.
Seminar orienting graduate students to RSEN and providing frameworks for collaborative leadership, whole systems thinking, and intercultural competency.

NR 333. Professional Writing. 0.5-1 Credits.
Writing workshop that explores essay and report writing, as published in both popular and professional journals that examine the natural world and its resources. Prerequisites: None, but preference is given to Field Naturalist and Ecological Planning Graduate students; other students may enroll with instructor permission. Cross-listed with: PBIO 333.

NR 334. Professional Writing. 1 Credit.
Writing workshop that explores essay and report writing, as published in both popular and professional journals that examine the natural world and its resources. Prerequisites: None, but preference is given to Field Naturalist and Ecological Planning Graduate students; other students may enroll with Instructor permission. Cross-listed with: PBIO 334.

NR 341. Ecological Economic Theory. 3 Credits.
A transdisciplinary study of the economic system as embedded and interdependent on social institutions and environmental systems. Prerequisite: Graduate student standing.

NR 343. Fndmtls of Geog Info Systems. 3 Credits.
Concepts and methods in Geographic Information Systems (GIS) presented at an accelerated pace for Graduate students using ArcGIS software. Pre/co-requisites: Graduate standing.

NR 346. Digital Image Processing. 2 Credits.
Principles and applications of digital image processing of remotely sensed imagery. Hands-on analyses of satellite imagery will address environmental issues using ERDAS Imagine software.

NR 354. Seminar:Envrmtl Policy & Mgmt. 3 Credits.
Seminar examining contemporary environmental policy at local, state, national, and international levels; policy formulation, implementation and design relative to current environmental problems. Prerequisites: Graduate standing.

NR 356. Conservation, Systems&Sustain. 3 Credits.
Conservation concepts and practice, viewed through the lens of history, systems, and sustainability. From site to landscape scale, with case studies and practitioner interviews. Prerequisites: An upper-level ecology or field science course. Cross-listed with: PBIO 356.

NR 360. Environmental Sociology. 3 Credits.
An in-depth exploration of how sociologists understand the relationship between a) the physical environment’s effects on society, and b) society’s effects on the natural environment. Prerequisite: Graduate standing; or Instructor permission. Fall. Alternate years.

NR 361. Politic:Landscape,Place,Nature. 2 Credits.
Seminar exploring the social and political construction of nature, emphasizing how natural resources and environment are defined through social relationships in particular landscapes and places.

NR 362. Leadership Relevancy 21st Cent. 3 Credits.
Perspectives and tools for working on 21st challenges and opportunities. Targets public land managers. Week-long course in Vermont followed by online presentations, readings, online discussions. Part of NPS Graduate Certificate. Prerequisite: Graduate standing.

NR 375. NR Planning: Laboratory. 1 Credit.
Experiential laboratory applying natural resource planning theory and methods to local or regional issues. Students conduct a planning exercise for a town or region. Co-requisite: Concurrent enrollment in NR 275.
NR 376. Graduate Teaching Practicum. 2 Credits.
Natural Resource teaching practicum for doctoral students in the Rubenstein School. Course is required if students are following the academic option. Should be taken concurrently or one semester in advance of completion of the doctoral teaching requirement. Prerequisite: doctoral standing.

NR 377. Land Use Policy & Economics. 3 Credits.
Economic and social forces that drive urban and suburban land use patterns, such as urban sprawl, and the policy mechanisms designed to intervene in those processes. Pre/co-requisites: Graduate standing or Instructor permission. Cross-listed with: TRC 316.

NR 378. Integrating Analyses NR Issues. 3 Credits.
Comparison of epistemologies and ontologies of natural resource disciplines. Applications from fields such as ecology, policy, sociology, economics, engineering, and ethics. Prerequisite: Graduate standing.

NR 380. Seminar in Natural Resources. 0.5-2 Credits.
Presentation and discussion of advanced problems, research, and current topics in natural resources by faculty, graduate students, and outside guest speakers.

NR 382. Seminar in Research Planning. 1 Credit.
Discussions of the planning and activities associated with Graduate student projects and research. Prerequisite: Instructor permission. Cross-listed with: FOR 382.

NR 384. Independent Study in NR. 1-18 Credits.
Readings, with conferences, to provide graduate students with backgrounds and specialized knowledge relating to an area in which an appropriate course is not offered.

NR 385. Special Topics in NR. 0-3 Credits.
Graduate topics and material that may eventually develop into a regular course offering; in addition, it may include topics and material presented only once.

NR 391. Master’s Thesis Research. 1-18 Credits.
NR 392. Master’s Project Research. 1-12 Credits.
NR 491. Doctoral Dissertation Rsch. 1-18 Credits.