FOREST SCIENCE RESEARCH SEMINAR
Spring. 2(2-0): P: Completion of Tier I Writing Requirement R: Open to juniors or seniors in the Forestry major. Approval of department. Epistemology, scope, and methodology of disciplines within forestry. Research ethics. Design and analysis of research projects.

SOCIAL APPLICATIONS IN FORESTRY
Spring. 2(2-0): P: ISS 210 or ISS 215 or ISS 220 or ISS 225
Social factors underlying forest resource management issues. Public values, attitudes, knowledge, and behavior with respect to forests. Public participation, conflict resolution, and communicating forestry issues.

FOREST PRODUCTS INTERNSHIP
Summer. 2 credits. RB: FOR 304 or FOR 305 R: Open only to juniors in the Forestry major.
Pre-professional educational employment experience in forest products industry, government, or public agency.

FOREST ECOLOGY
Fall. 3(3-0): P: CSS 210 and (PLB 105 or BS 162 or LB 144) RB: ZOL 355
Ecological interactions crucial to the sustainable management of forest ecosystems. Plant resources, species interactions, succession, biodiversity, productivity, nutrient and carbon cycling, ecosystem structure and function, exotic species, global environmental change.

FOREST ECOLOGY LABORATORY
Fall. 1(0-3): P: CSS 210 and (PLB 105 or BS 162 or LB 144) and (FOR 404 or concurrently) RB: ZOL 355
Field studies and data analysis of ecological processes central to the sustainable management of forest ecosystems. Field exercises cover primary production, community structure, soil resources, biodiversity, succession, nutrient cycling, critiques of primary literature. Weekend field trips required.

SILVICULTURE

FOREST RESOURCE MANAGEMENT
Fall. 3(2-2): P: FOR 406 and (FOR 464 or concurrently) RB: Forestry major. Management of forests to sustain ecological, economic, and social values. Management and administration of forestry organizations. Timber production in multiple-use and ecosystem management contexts.

FOREST SCIENCE THESIS (W)
Fall. Spring. 3(3-0): P: Completion of Tier I writing requirement. RB: FOR 308 R: Open to seniors in the Forestry major. Selecting, researching, and evaluating a forest science issue and communicating findings in a thesis and a departmental seminar.

WILDLAND FIRE
Spring. 2(1-2): P: FOR 404 or ZOL 355 Fire in wildland forest and grassland communities as a physical and ecological process. Fire history, culture, and management. Global perspectives, strategies for prevention and suppression of wildfires. Techniques for using prescribed fire.

FOREST PRODUCTS MARKETING
Spring. 2(2-0): P: EC 201 or EC 202
Global marketing of forest products. Domestic and international marketing, trade patterns and policies, resource base dynamics, pricing strategy, and marketing techniques.

APPLICATIONS OF GEOGRAPHIC INFORMATION SYSTEMS TO NATURAL RESOURCES MANAGEMENT
Spring. 4(2-4) Interdepartmental with Community, Agriculture, Recreation and Resource Studies and Biosystems Engineering and Fisheries and Wildlife and Geography. Administered by Fisheries and Wildlife. P: GEO 221
Application of geographic information systems, remote sensing, and global positioning systems to integrated planning and management for fish, wildlife, and related resources.

ENVIRONMENTAL AND NATURAL RESOURCE LAW
Fall. 3(3-0) Interdepartmental with Environmental Economics and Policy and Environmental Studies and Agriscience and Fisheries and Wildlife and Women's Studies. Administered by Fishers and Wildlife. R: Not open to freshmen.

WOOD TECHNOLOGY
Fall. 4(3-3) P: CEM 141 R: Not open to freshmen or sophomores. Structure and identification of wood. Physical and mechanical characteristics. Major industrial timber utilization processes including manufacture of lumber, furniture, composites, and paper.

WOOD COMPOSITES

FOREST BIOMETRY
Spring. 4(3-2) P: MTH 116 or MTH 124 or MTH 132 or LBS 118 RB: FOR 204 R: Not open to freshmen or sophomores. Describing location and area of forest resources. Quantification of site, stand, and tree characteristics. Sampling and inventory. Predicting growth and yield.

LUMBER MANUFACTURING AND PROCESSING
Spring. 4(3-2) P: FOR 304 or approval of department R: Open to undergraduate students in the Forestry major. Quality factors that influence the conversion of logs into lumber. Field trips required.
Forestry—FOR

452 Watershed Concepts
Fall, Spring, Summer. 3(3-0) Interdepartmental with BioSystems Engineering and Crop and Soil Sciences and Environmental Studies and Agriscience and Fisheries and Wildlife. Administered by Environmental Studies and Agriscience. P: ESA 324 and ZOL 355 RB: organic chemistry SA: RD 452

Watershed hydrology and management. The hydrologic cycle, water quality, aquatic ecosystems, and social systems. Laws and institutions for managing water resources.

464 Forest Resource Economics (W)
Fall. 3(2-2) P: (EC 201 or EC 202) and completion of Tier I writing requirement. R: Not open to freshmen or sophomores.

Basic economic principles that govern human use and production of forest resources. Application of financial and economic analysis techniques to forest resource allocation.

466 Natural Resource Policy
Spring. 3(3-0) Interdepartmental with Fisheries and Wildlife and Park, Recreation and Tourism Resources and Resource Development. Administered by Forestry. R: Not open to freshmen or sophomores.

Natural resources policy-making in the context of scientific, environmental, social, and legal-institutional factors. Historical evolution of policies and case studies of contemporary policy issues.

467 BioEnergy Feedstock Production
Fall. 3(3-0) Interdepartmental with BioSystems Engineering and Crop and Soil Sciences. Administered by Crop and Soil Sciences. P: MTH 103 or MTH 116 RB: CSS 101 and CSS 210

Agronomic, economic, technological, and environmental principles involved in bioenergy feedstock production. Cultivation, harvest, transportation, and storage of agricultural and forest biomass.

478 Integrated Pest Management (W)
Spring. of odd years. 3(3-0) Interdepartmental with Crop and Soil Sciences and Entomology and Horticulture. Administered by Entomology. P: (ENT 404 or ENT 470 or PLP 405 or PLP 302) and completion of Tier I writing requirement

Theory, philosophy and application of pest management focusing on agricultural and natural systems.

480 Woody Plant Physiology
Spring. 3(3-0) Interdepartmental with Horticulture. Administered by Horticulture. P: BS 162 or PLB 105 RB: Not open to freshmen or sophomores.

Physiology of carbon utilization. Effects of water, temperature, nutrition, and light on apical, vegetative, and reproductive growth of woody plants.

486 Biotechnology in Agriculture: Applications and Ethical Issues
Fall of even years. 3(3-0) Interdepartmental with Crop and Soil Sciences and Horticulture and Philosophy. Administered by Horticulture. P: BS 161 or PLB 105 RB: CSS 350 or ZOL 350 R: Not open to freshmen or sophomores.

Current and future roles of biotechnology in agriculture: scientific basis, applications. Environmental, social, and ethical concerns.

490 Independent Study in Forestry
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to juniors or seniors. Approval of department.

Special problems course for students qualified for advanced study in some phase of forestry.

802 Forest Science Research
Fall. 2 credits.

The philosophy, nature, and procedures of research in the forestry sciences.

804 Forest Ecology
Fall of odd years. 3(3-0) RB: FOR 404. Processes controlling population, community, ecosystem, landscape, and global ecology of forested systems. Extrapolation across scales, succession, spatial models of forest dynamics, causes and consequences of biodiversity, nutrient cycling, sustainability of managed ecosystems and human-accelerated environmental change.

819 Advanced Plant Breeding
Fall of even years. 3(3-0) Interdepartmental with Crop and Soil Sciences and Horticulture. Administered by Horticulture. RB: STT 422 and ZOL 341

Genetic expectations resulting from breeding strategies with cross- and self-pollinated crop plants. Germplasm collections, mapping populations, and modifications of reproductive biology useful for crop improvement.

820 Plant Reproductive Biology and Polyploidy
Spring of odd years. 1(3-0) Interdepartmental with Crop and Soil Sciences and Horticulture and Plant Biology. Administered by Horticulture. RB: Introductory Genetics and Plant Biology

Genetic processes underlying variations in plant reproductive biology and polyploidy. Utilization of these characteristics in plant breeding.

821 Crop Evolution
Spring of odd years. 1 credit. Interdepartmental with Crop and Soil Sciences and Horticulture and Plant Biology. Administered by Horticulture. RB: Introductory Genetics and Plant Biology

Cultural and biological aspects of the evolution of domestic plants.

822 Historical Geography of Crop Plants
Spring of odd years. 1 credit. Interdepartmental with Crop and Soil Sciences and Horticulture and Plant Biology. Administered by Horticulture. RB: Introductory Genetics and Plant Biology

Development and spread of the major crop species.

826 International Development Theory and Practice
Fall. 3(3-0) Interdepartmental with Community, Agriculture, Recreation and Resource Studies and Anthropology and Political Science and Social Science. Administered by Community, Agriculture. Recreation and Resource Studies. SA: RD 826


829 The Economics of Environmental Resources
Spring. 3(3-0) Interdepartmental with Community, Agriculture, Recreation and Resource Studies and Agricultural Economics and Economics and Fisheries and Wildlife. Administered by Agricultural Economics.

Economic principles related to environmental conflicts and public policy alternatives. Applications to water quality, land use, fish and wildlife, conservation, development, and global environmental issues.

831 Forest Biogeochemistry and Global Climate Change
Fall. 3(3-1) RB: Background course in ecology.

Biogeochemical cycling of carbon and nutrients within forest ecosystems. Disturbance, harvesting and forest management effects on the exchange of greenhouse gases between forest ecosystems and the atmosphere.

833 Human Dimensions of Forest Carbon Management
Fall. 3(3-0)

Social dimensions associated with the development and implementation of forest-based climate change mitigation projects, including: valuation of trees and forests by local communities vs. international community; community decision making; public participation; community engagement.

835 Forest Carbon Policy, Economics and Finance
Spring. 3(3-0)

Policy, economic and financial dimensions of the development and implementation of forest-based climate change mitigation projects, including: the role of forests in international agreements and policy, finance and investment approaches to forest carbon sequestration; emissions trading; biofuels; and valuation of ecosystem services.

837 Measurement and Monitoring of Forest Carbon
Spring. 3(2-2)

Skill-based training in forest carbon inventory and carbon accounting methods. National and international monitoring of forest carbon stocks. Applications of remote sensing and geospatial technologies to forest carbon inventory.

842 Population Genetics, Genealogy and Genomics
Fall. 3(3-0) Interdepartmental with Animal Science and Crop and Soil Sciences and Fisheries and Wildlife and Genetics and Horticulture. Administered by Forestry. RB: Pre-calculus, basic genetics


858 Gender, Justice and Environmental Change: Issues and Concepts
Fall. 3(3-0) Interdepartmental with Anthropology and Criminal Justice and Fisheries and Wildlife and Geography and Sociology. Administered by Fisheries and Wildlife. RB: Background in social science, environmental science, natural resources.

Issues and concepts related to gender, ecology, and environmental studies. Key debates and theoretical approaches to addressing environmental issues from a gender and social justice perspective. Gender and environment issues and processes from a global perspective.
859  Gender, Justice, and Environmental Change: Methods and Application
Spring of even years. 3(3-0) Interdepartmental with Anthropology and Fisheries and Wildlife and Geography and Resource Development and Sociology. Administered by Anthropology. RB: Background in social science, environmental science, or natural resources.
Methods and case studies related to gender, ecology, and environmental studies. Methodological and fieldwork issues from a feminist perspective in international and intercultural contexts. Qualitative and quantitative methods for integrating social and environmental data.

866  Economics of Renewable Resources
Spring of odd years. 3(2-2) Interdepartmental with Resource Development. Administered by Forestry. RB: AEC 829 or EC 803 or EC 805
Applications of economic theory and analysis to renewable natural resources problems. Focus on renewable resource interactions, including multiple-use forestry and agroforestry.

872  Parks and Protected Areas Policy and Management
Spring of odd years. 3(3-0) Interdepartmental with Community, Agriculture, Recreation and Resource Studies. Administered by Community, Agriculture, Recreation and Resource Studies. SA: PRR 842

885  Leadership in Natural Resources and Environmental Management
Fall of even years. 3(3-0) Interdepartmental with Agricultural Economics and Fisheries and Wildlife. Administered by Fisheries and Wildlife.
Theory and practice of leadership in natural resource and environmental management. Integration across disciplinary and jurisdictional divisions.

890  Special Problems
Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 7 credits in all enrollments for this course. R: Approval of department; application required.
Advanced individual study in an area of forestry.

891B  Selected Topics in Plant Breeding and Genetics
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Crop and Soil Sciences and Horticulture. Administered by Horticulture. R: Open only to graduate students in the Plant Breeding and Genetics major or Genetics major. Approval of department.
Selected topics in plant breeding.

892  Plant Breeding and Genetics Seminar
Fall, Spring, Summer. 1(1-0) A student may earn a maximum of 8 credits in all enrollments for this course. Interdepartmental with Crop and Soil Sciences and Horticulture. Administered by Horticulture.
Experience in review, organization, oral presentation, and analysis of research.

899  Master's Thesis Research
Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
Master's thesis research.

923  Advanced Environmental and Resource Economics
Fall. 3(3-0) Interdepartmental with Agricultural Economics and Economics and Park, Recreation and Tourism Resources and Resource Development. Administered by Agricultural Economics. RB: AEC 829 and EC 812A
Advanced economic theory of environmental management and policy. Treatment of externalities and market and non-market approaches to environmental improvement. Topics in conservation and sustainable economic growth. Applications to research and policy.

925  Advanced Natural Resource Economics
Spring. 3(3-0) Interdepartmental with Agricultural Economics and Economics. Administered by Agricultural Economics. RB: (EC 812A and EC 812A and AEC 829 and FOR 866) and (AEC 829 or FOR 866) SA: AEC 991H
Economic theory of managing nonrenewable and renewable resources, including optimal use, the incentives for use under decentralized markets, and public policy design. Analysis of the co-evolution of economic and ecological systems.

941  Quantitative Genetics in Plant Breeding
Spring of even years. 3(2-2) Interdepartmental with Crop and Soil Sciences and Horticulture. Administered by Crop and Soil Sciences. RB: CSS 819 and STT 464
Theoretical and genetic basis of statistical analysis of quantitative traits using genetic markers. Computational tools for the study of quantitative traits.

999  Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to doctoral students in the Department of Forestry.
Doctoral dissertation research.

999  Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to doctoral students in the Department of Forestry.
Doctoral dissertation research.