

Forest Resources & Env Science

FW 1035 - Wood Anatomy and Properties

An introduction to the micro- and macro-anatomy of wood, how wood structure is related to its function in the tree, wood quality, physical properties, and its utilization as an industrial raw material.

Credits: 4.0

Lec-Rec-Lab: (3-0-3)

Semesters Offered: Spring

FW 1050 - Natural Resources Seminar

Seminar introduces students to the various careers within forestry, conservation, ecology, and wildlife that represent specialties within natural resources.

Credits: 1.0

Lec-Rec-Lab: (1-0-0)

Semesters Offered: Spring

FW 2010 - Vegetation of North America

Identification of trees and shrubs. Study of seed dispersal, dormancy, seedbed requirements, shade tolerance, life span, and ecology, with an emphasis on trees. Systematic study of the major forested vegetation types of North America.

Credits: 4.0

Lec-Rec-Lab: (2-1-3)

Semesters Offered: Fall

FW 2051 - Field Techniques

Equipment and techniques used to measure forest ecosystem attributes and perform fieldwork. Topics include field safety, land measurement and navigation, establishment of sample locations, measurement of attributes of individuals and groups of trees, vegetation and other organisms.

Credits: 1.0

Lec-Rec-Lab: (0-0-3)

Semesters Offered: Fall

FW 3010 - Practice of Silviculture

Methods of controlling the establishment, growth, composition, health and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

Credits: 4.0

Lec-Rec-Lab: (2-1-3)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Forestry, Wildlife Ecology & Mgmt, App Ecol & Environ Sci

Pre-Requisite(s): FW 2010 and FW 2051

FW 3012 - Survey of Silviculture

An introduction to the practice of silviculture including ecological principles which form the basis for forest management. The course emphasizes proper use of silviculture terminology and includes field examples of management practices.

Credits: 1.0

Lec-Rec-Lab: (0-0-2)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Forestry, Wildlife Ecology & Mgmt, App Ecol & Environ Sci

Pre-Requisite(s): FW 2010 and FW 2051

FW 3020 - Forest Ecology

Gain a basic understanding of how forest ecosystems function across various temporal and spatial scales. Emphasizes real-world problems and the skills necessary to resolve land-use conflicts and to manage terrestrial ecosystems.

Credits: 3.0

Lec-Rec-Lab: (2-0-3)

Semesters Offered: Fall

Pre-Requisite(s): FW 2010(C) and FW 2051(C)

FW 3075 - Introduction to Biotechnology

Basic concepts and practical applications of biotechnology and genetic engineering. Topics include advances and practical applications relating to improving quality and field performance of agricultural crops, environmental remediation, and phyto-pharmaceuticals. Recent advances in gene containment, regulatory, societal and environmental issues associated with commercialization of genetically modified organisms will be discussed.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Spring

FW 3098 - Wood Processing and Manufacture

A huge variety of products are manufactured from wood. Wood-based manufacturing plants in the upper Midwest are visited during the week prior to the start of the fall semester. Plant similarities and differences are discussed during class meetings.

Credits: 2.0

Lec-Rec-Lab: (1-0-3)

Semesters Offered: Fall

Pre-Requisite(s): FW 1035

FW 3110 - Natural Resource Policy

Covers concepts related to social systems and natural resources. Offers a survey of natural resource policies and organizations. State and federal levels of policymaking will be linked to the human values, attitudes, and beliefs that set the context for natural resource policy processes.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Spring

FW 3150 - Timber Harvesting

Methods and techniques used in timber harvesting systems. Emphasizes best management practices, aesthetic and ecological impacts, logging cost analysis, timber appraisal, and timber sale preparation and administration.

Credits: 2.0

Lec-Rec-Lab: (1-0-3)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Forestry

Pre-Requisite(s): FW 2051

FW 3170 - Land Measurements and GPS

Introduces field measurements and computations involved in determining direction, distance, and area. Covers the hand compass, pacing, and use of GPS, including differential correction. Integration of GPS data with GIS is emphasized.

Credits: 1.0

Lec-Rec-Lab: (0-0-3)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Forestry, Wildlife Ecology & Mgmt, App Ecol & Environ Sci

Co-Requisite(s): FW 3190

Pre-Requisite(s): FW 3540

FW 3180 - Geomorphology, Landscapes and Ecosystems

Provides basic understanding of the geologic and glacial processes that shaped the landscape of the Upper Midwest influencing the distribution and productivity of modern-day plant communities. Topics include geology of Michigan, glacial geomorphology, soil development, landscape and community ecology, and forestry.

Credits: 2.0

Lec-Rec-Lab: (1-0-3)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Wildlife Ecology & Mgmt, App Ecol & Environ Sci; May not be enrolled in one of the following Class(es): Freshman

FW 3190 - Multi-resource Assessment

Develops a basic proficiency in the application of multiple-resource measurement techniques. Gain familiarity with the application of individual tree and landscape measurements as well as estimation of growth, sampling techniques, computational procedures, and mapping procedures commonly used in forest and land management.

Credits: 3.0

Lec-Rec-Lab: (0-1-4)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Forestry, Wildlife Ecology & Mgmt, App Ecol & Environ Sci

Pre-Requisite(s): FW 2051 and FW 3020 and FW 3200 and (MA 2710 or MA 2720 or MA 3710)

FW 3200 - Inventory, Monitoring and Data Analysis

Sampling design, implementation and analysis for inventory and monitoring of attributes of stands, forests and landscapes. Includes computing skills for data entry, storage and analysis and application of statistical techniques to answer questions about ecological data.

Credits: 4.0

Lec-Rec-Lab: (3-0-3)

Semesters Offered: Spring

Pre-Requisite(s): FW 2051 and (MA 2710 or MA 2720 or MA 3710)

FW 3300 - Introduction to Genomics

Introduction to Genomics. Genome organization, mapping and characterization from humans and related organisms. Topics include hierarchical arrangement of genes, genome mapping, molecular markers of physical genome maps, genome sequencing, comparative genomics, analysis of important human genes and their products, and ethical and legal aspects of genomics.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Fall

Restrictions: May not be enrolled in one of the following Class(es): Freshman

Pre-Requisite(s): BL 2200

FW 3330 - Soil Science

Introduction to the chemical, physical, and biological properties of soil.

Credits: 4.0

Lec-Rec-Lab: (3-0-3)

Semesters Offered: Fall

Pre-Requisite(s): CH 1100(C) or CH 1110(C) or CH 1112(C) or (CH 1150(C) and CH 1151(C))

FW 3376 - Forest & Environmental Resource Management (The FERM) I

Application of forest and environmental management practices by teams of students with the assistance of faculty, staff and representatives of state, federal and corporate land management groups as well as non-governmental organizations.

Credits: 2.0; May be repeated

Lec-Rec-Lab: (0-2-0)

Semesters Offered: Fall, Spring, Summer

Pre-Requisite(s): FW 2010 and FW 2051

FW 3377 - Forest & Environmental Resource Management (The FERM) II

Application of forest and environmental management practices by teams of students with the assistance of faculty, staff, and representatives of state, federal, and corporate land management groups as well as non-governmental organizations.

Credits: 3.0; May be repeated

Lec-Rec-Lab: (0-3-0)

Semesters Offered: Fall, Spring, Summer

Pre-Requisite(s): FW 2010 and FW 2051

FW 3378 - Forest & Environmental Resource Management (The FERM) III

Application of forest and environmental management practices by teams of students with the assistance of faculty, staff, and representatives of state, federal, and corporate land management groups as well as non-governmental organizations.

Credits: 4.0; May be repeated

Lec-Rec-Lab: (0-4-0)

Semesters Offered: Fall, Spring, Summer

Pre-Requisite(s): FW 2010 and FW 2051

FW 3410 - Conservation Biology

Introduction to biological, social, political, and economic facets of conservation biology. Emphasizes evaluation of how best to maintain and restore biodiversity through management of populations and ecosystems. Topics include mass extinctions, global change, loss and degradation of habitat, and over exploitation of biological resources.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Spring

FW 3540 - An Introduction to Geographic Information Systems for Natural Resource Management

The fundamentals of GIS and its application to natural resource management. Spatial data, its uses and limitations are evaluated. Students work extensively with the ARCGIS software package.

Credits: 4.0

Lec-Rec-Lab: (3-0-3)

Semesters Offered: Spring

Restrictions: Must be enrolled in one of the following Major(s): App Ecol & Environ Sci, Forest Ecology & Mgmt, Wildlife Ecology & Mgmt, Forest Science, Forestry, For Molec Genetics & Biotech, Applied Ecology, Forestry

Pre-Requisite(s): MA 2710(C) or MA 2720(C) or MA 3710(C)

FW 3600 - Wildlife Habitat

Understand the ecological basis for management of forest wildlife and how forest management influences wildlife populations. Laboratory introduces techniques in wildlife research and management, especially methods of habitat analysis.

Credits: 3.0

Lec-Rec-Lab: (2-0-3)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Forestry, Wildlife Ecology & Mgmt, App Ecol & Environ Sci; May not be enrolled in one of the following Class(es): Freshman

FW 3610 - Ornithology

An ecological and evolutionary approach to the study of birds. Topics include behavioral, anatomical, and physiological adaptations to flight, life history, mating systems, migration, communication and conservation. Laboratory emphasizes identification and experimental use of birds as model organisms.

Credits: 4.0

Lec-Rec-Lab: (3-0-3)

Semesters Offered: Spring

Pre-Requisite(s): BL 1040 or BL 1020

FW 3620 - Field Ornithology

An introduction to field techniques and identification. Weekend trip to Whitefish Point Bird Observatory during spring migration and field note taking.

Credits: 1.0

Lec-Rec-Lab: (0-1-0)

Semesters Offered: Summer

FW 3630 - Wildlife Habitat Diseases and Parasites

The ecological management of forest wildlife and how management influences wildlife populations. Laboratory introduces techniques in wildlife research and management, including habitat analysis. Includes detection and identification of wildlife diseases and parasites, and may include field trips to area landowners.

Credits: 4.0

Lec-Rec-Lab: (2-1-3)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following College(s): Sch of Forest Res & Envir Sci; Must be enrolled in one of the following Major(s): Wildlife Ecology & Mgmt, App Ecol & Environ Sci; May not be enrolled in one of the following Class(es): Freshman

FW 3760 - Human Dimensions of Natural Resources

Uses sociological concepts to cover facets of human relationships to natural resources, including human values, beliefs, and attitudes regarding the environment; rural resource-dependent communities; natural resource professions and expert knowledge; and the history of American perspectives on the environment.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Fall

FW 3800 - Insect Ecology

Insects are widespread and diverse components of terrestrial and aquatic ecosystems. This course will consider aspects of insect ecology, including biodiversity and conservation of insects, the effects of biotic and abiotic factors on insect populations, and the trophic diversity of insects.

Credits: 2.0

Lec-Rec-Lab: (1-1-0)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Wildlife Ecology & Mgmt, App Ecol & Environ Sci

FW 3840 - Forest Health

Drawing on examples from the Great Lakes region, and other parts of North America, this course will consider which type of insects and pathogens attack our trees and forests, how they interact with each other, and what tools we can use to effectively reduce their negative impacts of forest pests.

Credits: 3.0

Lec-Rec-Lab: (1-1-3)

Semesters Offered: Fall

Restrictions: Must be enrolled in one of the following Major(s): Forestry, Wildlife Ecology & Mgmt, App Ecol & Environ Sci

Pre-Requisite(s): FW 3020

FW 4000 - Professional Experience Program

Students create oral/written report based on paid or volunteered work or field experience in natural resources.

Credits: 1.0; Repeatable to a Max of 4

Lec-Rec-Lab: (0-1-0)

Semesters Offered: Fall, Spring, Summer

Restrictions: Permission of department required

FW 4080 - Forest Economics and Finance

Financial analysis and economic theory applied to forestry project analysis and selection, focusing on prices. Covers risk, capital markets, taxation, auctions, and non-market valuation.

Credits: 3.0

Lec-Rec-Lab: (2-0-2)

Semesters Offered: Spring

Restrictions: May not be enrolled in one of the following Class(es): Freshman

FW 4089 - Bioinformatics

Computer applications in molecular biology. Hands-on experience with popular computer programs for DNA, RNA, and protein sequence analysis. Learn database management, data editing, assembly, and organization. Covers multiple-sequence comparisons, protein structural analysis, evolutionary relationships of genes, and use of internet for data retrieval, comparison, and analysis.

Credits: 3.0

Lec-Rec-Lab: (2-0-2)

Semesters Offered: Spring - Offered alternate years beginning with the 2005-2006 academic year

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

FW 4110 - Tree Seedling Production and Greenhouse Management

Demonstrates greenhouse culture of trees from seed or vegetative cuttings. Topics include production of containerized seedlings; vegetative propagation via budding, grafting, and rooting of cuttings; and genetic manipulation. Students have hands-on roles in the routine greenhouse culture, such as media preparation, pest management, and fertilization.

Credits: variable to 4.0

Semesters Offered: Spring

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

FW 4120 - Tree Physiology and Genetics

Introduction to the genetics and physiology of forest trees. Develops a basic understanding of how trees grow and develop and why they vary from tree to tree. Covers modern methods to improve forest trees.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Spring

FW 4140 - Vegetation Modeling

Use of models in research and management of terrestrial ecosystems. Teaches application with emphasis on philosophy; models as tools, design goals and approaches, and interpreting the meaning and significance of model outputs.

Credits: 2.0

Lec-Rec-Lab: (1-0-2)

Semesters Offered: Spring

Restrictions: May not be enrolled in one of the following Class(es): Freshman

Pre-Requisite(s): FW 3010 or FW 3012

FW 4150 - Forest Resource Management

Methods of organizing forest properties for sustainability and multiple-use management using operations research methods, particularly linear programming, for selecting preferred options. Emphasizes developing an understanding of the strengths and weaknesses of the models used. Discusses single- and multiple-use land management formulations.

Credits: 3.0

Lec-Rec-Lab: (2-0-3)

Semesters Offered: Fall

Pre-Requisite(s): FW 3010 and FW 4080

FW 4170 - Consulting Forestry

For students who are considering consulting forestry as a career. Covers issues specific to working with private landowners, stewardship plan writing, choosing a business entity, marketing, taxes, income/expenses, insurance, timber sale administration, and resolving landowner disputes.

Credits: 2.0

Lec-Rec-Lab: (2-0-0)

Semesters Offered: Summer

FW 4220 - Wetlands

Study of the physical, chemical, and biological characteristics of wetlands. Describes functions and values of individual wetland types. Presents management of wetlands and laws governing wetlands. Labs concentrate on field techniques used to assess specific plant, animal, soil, and hydrological characteristics of wetlands.

Credits: 4.0

Lec-Rec-Lab: (3-0-3)

Semesters Offered: Fall

FW 4240 - Mammalogy

Covers the classification, structure, and natural history of mammals, including physiological, behavioral, and ecological adaptations. Through laboratory and fieldwork, emphasizes field techniques and the distribution and identification of mammals, especially those species found in the western Great Lakes.

Credits: 4.0

Lec-Rec-Lab: (3-0-3)

Semesters Offered: Fall

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

Pre-Requisite(s): BL 1040

FW 4260 - Population Ecology

Covers the principles of population ecology. Topics include measures of populations, population dynamics, and models used to describe the theories related to population dynamics.

Credits: 3.0

Lec-Rec-Lab: (0-3-0)

Semesters Offered: Fall

FW 4300 - Introduction to Wildland Fire

An introduction to wildland fire based on an understanding of fuel properties, fire behavior, ecological effects and management.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Spring

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

Pre-Requisite(s): FW 3020 and (FW 3010 or FW 3012)

FW 4370 - Forest and Landscape Hydrology

The course will use a process-based approach to present the physical hydrology, geomorphology and water quality of forested watersheds. Course focuses on the interaction between watershed processes and forest management.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Spring

FW 4380 - Landscape Ecology

Basic principles of landscape ecology, including pattern, process, and scale. Students will learn how to use quantitative tools to study landscape-scale patterns and processes, and how to apply these principles and tools to conservation, resource management, and planning issues.

Credits: 3.0

Lec-Rec-Lab: (0-3-0)

Semesters Offered: Spring

Restrictions: Must be enrolled in one of the following Class(es): Junior, Senior

FW 4400 - Urban Forestry

Urban forestry covers the planting and maintenance of trees in urban settings. Presents modern arboriculture and tree care methods and discusses administration of urban forests. Topics covered include pest management, pruning, planting, fertilization, inventories, tree selection, and line clearance. Labs include experience in tree climbing, pruning, and planting.

Credits: 3.0

Lec-Rec-Lab: (2-0-3)

Semesters Offered: Spring

FW 4500 - Independent Study

Guided study or research on an approved forest resource topic with a chosen faculty member.

Credits: variable to 7.0; Repeatable to a Max of 7

Semesters Offered: Fall, Spring, Summer

Restrictions: Permission of instructor required

FW 4540 - Remote Sensing of the Environment

Overview of remote sensing principles and concepts. Topics include camera and digital sensor arrays, various types of imagery, structure of digital data, spectral reflectance curves, applications/case studies and introduction to digital image processing.

Credits: 3.0

Lec-Rec-Lab: (2-1-0)

Semesters Offered: Fall - Offered alternate years beginning with the 2006-2007 academic year

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

FW 4610 - Wildlife Ecology

Covers the ecological basis for management of wildlife, including biological and sociological factors that influence management.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: Fall

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore

Pre-Requisite(s): BL 3400(C) or FW 3020(C)

FW 4620 - Herpetology

The biology of amphibians and reptiles, including evolution, zoogeography, ecology, behavior and physiology.

Credits: 3.0

Lec-Rec-Lab: (3-0-0)

Semesters Offered: On Demand

Pre-Requisite(s): BL 1040 or BL 1020

FW 4634 - Conservation Issues in Yellowstone

Yellowstone has a rich, complex history of conservation challenges. This course will provide in-depth explorations of conservation controversies occurring in Yellowstone; first in an MTU classroom, followed by an 8 day visit to the park. Course takes place in summer; dates vary.

Credits: 6.0

Lec-Rec-Lab: (0-3-9)

Semesters Offered: Summer

FW 4638 - Wolf Ecology and Management

Covers wolf ecology, current status and management of wolf populations throughout the U.S., wolf/prey dynamics, and field techniques utilized in the study of wild wolves. Course begins in the classroom, followed by a 4-day field trip (camping), which includes observation of captive wolves at the International Wolf Center, experience locating wild wolves (radio telemetry, howling surveys, wolf sign in the field) and a visit with wolf researchers.

Credits: 3.0

Lec-Rec-Lab: (2-0-2)

Semesters Offered: Summer

FW 4810 - Integrated Resource Assessment

Provides a capstone experience by integrating techniques from many of the applied ecology and forestry core courses. Covers multi-resource inventory of forested landscapes; description and evaluation of the potential for providing various natural resource outputs; development of GIS information and applications, maps, and other descriptors useful in the analysis of diverse management alternatives.

Credits: 4.0

Lec-Rec-Lab: (0-3-3)

Semesters Offered: Fall

Pre-Requisite(s): FW 3540 and FW 3020 and (FW 3190 or FW 3410)

FW 4850 - Environmental Education Methods

This course will prepare students to design and conduct environmental education programs for adults and youth in classrooms, parks, museums, nature centers, and through statewide outreach programs using a variety of teaching methods, hands-on activities, and scientific investigations.

Credits: 4.0

Lec-Rec-Lab: (2-1-1)

Semesters Offered: Spring

Restrictions: May not be enrolled in one of the following Class(es): Freshman, Sophomore