

FORESTRY

FOR

College of Agriculture and
Natural Resources**200. Resource Ecology and Man**

For course description, see Interdisciplinary Courses.

202. Introduction to Forestry

(101.) Fall. 3(3-0)

Forestry in its broadest sense, including: historic development, forest growth, protection and management, products, national and world economy and policy. Emphasis on multiple use concepts. One-day field trip required.

204. Forest Vegetation

Fall, Spring. 5(3-4) BOT 301, 302, or approval of department.

Nomenclature, classification, and identification of important trees, shrubs, and herbaceous plants of forest and field.

220. Plants and Their Environment

Winter. 3(3-0)

Fundamental ecological relationships between various climatic, edaphic and biotic environmental factors of the ecosystem and plant response, including structure, function and evaluation of species.

301. Quantitative Methods for Natural Resources

Fall. 4(3-3) MTH 109 or 111.

Collection and analysis of information pertaining to natural resources. Survey design, field procedures, equipment, and analytical techniques.

302. Forest Inventory

Winter. 3(2-3) 301.

Field and office techniques of forest inventory, with primary emphasis on timber resources.

305. Silvics and Silviculture

Fall. 5(4-3) 204.

Interrelationships of trees of the forest community and the environment; plant succession; statistical methods of community analysis; natural and artificial forest reproduction methods; intermediate cuttings; field studies of silvicultural conditions.

306. Forest Fire Protection and Use

Spring. 3(3-0) Juniors or approval of department.

Causes and effects of forest fires. Combustion, fire behavior, and fire weather. Prevention and control planning and techniques. Use of fire in forest land management. One-day field trip required.

309. Wood Technology

(F P 309.) Fall. 4(2-6)

Structure of wood. Mechanical and physical properties of wood. Wood anatomy and relation to growth.

348. Forest Regulation and Valuation

Winter. 3(3-0) 302, 305.

Principles of organizing and regulating forest properties; basic forest valuation procedures.

409. Forest Hydrology

Winter. 3(3-0) SLS 210.

Hydrologic cycle, with emphasis on soil, water and ground water regimes; instrumentation and measurement of the various components. Effects of forest management on watersheds and water yields.

410. Forest Tree Improvement

Fall. 3(2-2)

Distribution of genetic variation in natural tree populations. Introduction, selection, progeny testing, species hybridization, and polyploidy to obtain superior tree populations.

411. Tree Physiology

Fall. 3(3-0) BOT 301.

The fundamental principles of plant physiology with particular reference to the growth and development of woody plants, and consideration of the influence of genetic and environmental factors on physiological processes in trees.

419. Woodland Forestry

Fall, Spring, Summer. 3(2-2) Not open to majors.

Management of small woodlands. Tree identification; forest planting; improvement cutting and harvesting methods; forest measurements; use and marketing of forest products; other uses. One-day field trip required.

424. Forest Soils

Spring. 4(3-3) 220; SLS 210. Interdepartmental with Soil Science.

Interrelationships of forest site and the growth of forests. Classification and productivity of forest soils. Effects of silvicultural and forest management practices on the soil. Two-day field trip required.

430. Manufacture of Lumber and Composite Wood Products

(F P 310.) Winter. 3(3-0) 309.

Log and lumber grades, sawmill equipment and practices. Wood working machinery. Gluing of wood. Manufacture of pulp, plywood and other board products.

431. Finishing, Preservation and Drying of Wood

(F P 410.) Spring. 3(3-0) 309.

Properties, selection, application of decorative and protective coatings, wood preservatives and fire retardants. Air and kiln drying of lumber.

446. Range Management

Winter. 4(3-3) 220 or approval of department.

Development of range industry; grazing regions and reconnaissance; planning multiple-use management on forest range and watershed.

449. Field Studies in Forestry

Fall. 3 credits. 348.

Intensive study of multiple use forest resource management in various forest regions. Two and one-half-week field trip required.

450. Natural Resource Administration

Fall, Winter. 4(4-0) Interdepartmental with the Fisheries and Wildlife, Park and Recreation Resources, and Resource Development Departments.

Concepts and methods of economics and administration and application of techniques to management of wildlands.

454. World Forestry

Winter. 4(3-0)

Forest resources, forestry practices, and the forest economy throughout the world.

455. Harvesting Forest Products

(421.) Winter. 3(2-2) 450.

Planning, organizing, and controlling the utilization of timber resources, including cost control in timber harvesting systems.

456. Forest Resource Policy

(452.) Spring. 3(3-0) 455 or approval of department.

Evolution and development of public and private forest resource policy in the United States.

457. Forest Resource Planning

Spring. 4(2-2) 455.

Integrative planning for multiple-use forest resource management.

460. Arboriculture

(360.) Spring. 3(2-3) Approval of department.

Principles and techniques of species selection, establishment, and cultural practices used in the care and maintenance of shade and ornamental trees. Two-day field trip required.

465. Forest and Wood Science Problems

Fall, Winter, Spring, Summer. 1 to 5 credits. Seniors with a 2.80 average, or approval of department.

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

491. Natural Resources and Modern Society

Spring, Summer. 3(3-0) Juniors.

Interdepartmental with the Resource Development Department and Natural Resources.

A survey of the social and economic significance of natural resources in modern industrial and urban society. Current problems of natural resources management and use are examined in terms of the society in which they exist.

807. Special Problems

Fall, Winter, Spring, Summer. 2 to 5 credits. May re-enroll for credit with a maximum of 10 credits for the master's degree.

Advanced work in any of the following specialties: forest biometrics; forest photogrammetry; dendrology; silviculture; forest management; forest economics; forest influences; forest ecology; forest genetics; arboriculture; forest hydrology; forest soils; forest recreation; tree physiology; forest policy; forest products harvesting; wood chemistry; wood preservation; timber mechanics; wood conversion.

809. Natural Resources Economics

Winter. 3(3-0) Approval of department. Interdepartmental with the Resource Development Department.

Applications of economic analysis to natural resource problems.

828. Seminar

Fall, Winter, Spring. 1 to 3 credits. May re-enroll for a maximum of 12 credits if a different topic is taken.

Critical study and discussion of advanced forestry topics including natural resource economics, forest biology, and natural resource program budgeting.

830. Physiological Genetics

Winter. 3(3-0) Approval of department. Interdepartmental with Crop Science.

Physiological bases for genetic variation in higher plants including adaptive physiology, quantitative genetics, growth correlations, biochemical genetics, hybrid physiology, and genealogy.

851. Public Program Budgeting

Fall. 3(3-0) Approval of department. Interdepartmental with the Resource Development Department.

Survey of the federal government's planning-programming-budgeting system, stressing executive branch budget decision-making and budget administration in the natural resource bureaus.

855. Research Methods

Fall. 3(3-0) Approval of Department. Interdepartmental with and administered by the Resource Development Department.

Research techniques applicable to management, and policy-oriented natural resource investigations. Analysis of project designs; preparation of project proposals. Evaluation of representative published research studies.

899. Research
Fall, Winter, Spring, Summer. *Variable credit. Approval of department.*

999. Research
Fall, Winter, Spring, Summer. *Variable credit. Approval of department.*

FRENCH

See Romance Languages

GEOGRAPHY

GEO

College of Social Science

Courses are classified as follows:

- Cultural—301, 404, 419, 801, 901.
- Economic—213, 309, 409, 412, 413, 435, 454, 806, 807, 809, 835, 906.
- Field Techniques—415, 850.
- Geographic Education—458, 858.
- Historical—310, 810, 910.
- Independent Research—400H, 411, 818, 899, 918, 999.
- Medical—470, 870, 970.
- Physical—206, 206L, 429, 430, 431, 432, 451, 834, 902.
- Political—416, 808, 908.
- Population—320, 836, 934.
- Quantitative Methods—427, 428, 811.
- Regional—204, 300, 405, 406, 407, 408, 418, 420, 421, 440, 441, 450, 460, 461, 462, 463, 464, 812, 912.
- Theory and Philosophy—150, 425, 480, 825, 826, 827.
- Urban—318, 402, 403, 805.
- Visual Media and Techniques—222, 223, 324, 424, 426.

150. Geography of Selected Current Problems
Fall. 2(2-0)

The geographic perspective is used to examine U. S. and world problems of major concern such as international conflicts, environment quality, spatial change, and economic development.

200. Resource Ecology and Man
For course description, see *Interdisciplinary Courses*.

204. World Regional Geography
Fall, Winter, Spring, Summer. 4(3-0)
Analysis of the world's major natural habitats and man's relation to them.

206. Physical Geography
Fall, Winter, Spring, Summer. 4(4-0)
Principal earth surface elements of physical geography including weather, climate, landforms, soils, water and biotic resources, in their genetics, distributional and functional interrelationships.

206L. Physical Geography Laboratory
Fall, Winter, Spring. 1(0-2) 206 or concurrently.

Laboratory study of geographic aspects of map interpretation, aerial photographs, weather, climate, soils, landforms, and vegetation.

213. Economic Geography
Fall, Winter, Spring, Summer. 3(3-0)
Emphasis on world distribution of economic and business activities, stressing factors of location and economic concepts of locational change.

222. The World of Maps
Fall. 3(3-0).
Discussion of types, practical applications, and sources of maps.

223. Introduction to Cartography
Fall, Winter. 4(2-4)
Principles and techniques of constructing maps and other graphic devices. Types of map reproduction, application of quantitative methods to cartography.

300. Geography of North America
Fall, Winter, Summer. 4(3-0)
Human and physical geography of North America, north of the Mexican border.

301. Geography of Culture
(401.) Winter. 4(3-0). 204.
A systematic discussion of cultural geography, stressing cultural processes and relationships.

309. Geography of Recreation
Spring. 3(3-0)
Recreational land use and services in the United States, including analysis of resources basic to such land use and their distribution.

310. Historical Geography of the United States
Spring, Summer. 4(3-0)
Reconstruction of geographies of the United States as they existed in the past.

318. Cities of the World
Winter, Summer. 4(3-0).
A cross-cultural examination of cities, their historic growth, regional functions, and internal dynamics.

320. Geography of Population
Fall. 4(3-0).
A geographical analysis of world population including demographic characteristics, growth rates, and distributional patterns.

324. Remote Sensing: Airphoto Interpretation
Fall. 4(2-4) *Sophomores*.
Use of aerial photographs in the identification and interpretation of physical and cultural features of the terrestrial environment. Includes principles of photogrammetry.

341. Contemporary Problems of South Asia
For course description, see *Interdisciplinary Courses*.

342. Contemporary Problems of Japan
For course description, see *Interdisciplinary Courses*.

390. Survey of Subsaharan Africa
For course description, see *Interdisciplinary Courses*.

391. Survey of Subsaharan Africa
For course description, see *Interdisciplinary Courses*.

400H. Honors Work
Fall, Winter, Spring. 1 to 16 credits.
Approval of department.

402. The Geography of the City
Fall. 4(3-0).
Spatial theories, concepts, and designs of internal urban economic, social, and political structures.

403. The City and Its Region
Winter. 4(3-0).
The regional system of cities in terms of size, spacing, and functional relationships.

404. Advanced Cultural Geography
Spring. 4(3-0) 301 or approval of department.
Geographical analysis of selected aspects of human culture.

405. Geography of South America
Winter, Spring. 4(3-0) 204 or approval of department.
Regional geography of South America excluding countries bordering the Caribbean Sea; and the interpretation of present cultural-physical patterns.

406. Geography of Middle America
Fall. 4(3-0) 204 or approval of department.
Description and interpretation of the physical and cultural environment of Mexico, Central America, West Indies, and northern South America.

407. Geography of Michigan
Spring, Summer. 4(3-0) 204 or approval of department.
Selected aspects of the geography of Michigan, including the physical environment and cultural and economic considerations.

408. Geography of Canada
Spring. 4(3-0) 204 or approval of department.
Analysis of the cultural, economic, and physical regions of Canada and the role played by Canada in world affairs.

409. Geography of Transportation
(308.) Fall. 4(3-0).
Analysis of spatial principles of transportation, including factors of route, location, theories of interaction, and the role of transport in space-economy.

411. Problems in Geography
Fall, Winter, Spring, Summer. 1 to 6 credits. *Approval of department.*
Research on specialized geographic problems.

412. Geography of Agriculture
(312.) Winter. 4(3-0).
Analysis of the nature and world distribution of agricultural activities and settlements.

413. Geography of Manufacturing
Winter. 4(3-0) 213 or Juniors.
Evaluation of the place to place variation of different types of manufacturing industries, phasing the changes in regional structure of manufacturing and industrial location theory.

415. Field Techniques in Geography
Fall, Spring. 4(1-7) May re-enroll for a maximum of 8 credits. *Approval of department.*
Geographic field work including recognition and classification of natural and cultural features, interview procedures, and preparation of reports and maps based on field data.

416. Political Geography
Winter, Summer. 4(3-0) 204 or Juniors.
Spatial aspects of territoriality, boundaries, voting patterns, government programs, formation of political units, political development and integration, and environmental policy.

418. Geography of Polar Regions
Winter of even-numbered years. 4(3-0) 204 or approval of department.
The arctic, including the continental fringe