FOOD SYSTEMS ECONOMICS
AND MANAGEMENT

See Agricultural Economics.

FOREIGN LANGUAGES


FORESTRY

College of Agriculture and Natural Resources

In 305, 306, 402 and 430, field trips are scheduled for several consecutive days away from the campus for integrated field experience, primarily in the second half of spring term of the junior year, so that these courses must be taken concurrently. This precludes enrollment in other courses during that term. The approximate cost of these field trips is $250.

202. Introduction to Forestry
Fall, Spring. 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.

205. Resource Ecology
(1DC 206.) Fall, Winter, Spring, Summer. 3(3-0) Interdepartmental with the departments of Fisheries and Wildlife, Geography, Resource Development, and Zoology. Administered by the Department of Fisheries and Wildlife.
Basic concepts of ecology which are the unifying basis for resource management, conservation policy and the analysis of environmental quality. Excessive use of guest lecturers.

206. Forest Vegetation
Fall, Spring. 5(3-4)
Nomenclature, classification, and identification of important trees, shrubs, and herbaceous plants of forest and field.

220. Plants and Their Environment
Winter. 3(3-0) Interdepartmental with Agriculture and Natural Resources.
Relationships between plants and fundamental climatic, edaphic, and biotic factors; structure and function of different ecosystems in relation to environmental factors.

301. Quantitative Methods for Natural Resources
Winter. 4(3-2) MTH 109 or MTH 111.
Collection and analysis of information pertaining to natural resources. Survey design, field procedures, equipment, and analytical techniques.

304. Forest Ecology
Fall. 4(3-3) FOR 204; BOT 205; CSS 210 or concurrently.
The forest is viewed as a biological community. Forest site relationships are quantified by examining the existing physical environment and relating it to the forest species occupying that community.

305. Silviculture
Spring. 4(3-3) FOR 204, FOR 205, FOR 424, FOR 425, FOR 429 concurrently.
Natural and artificial forest reproduction methods: intermediate stand treatments; nontimber aspects of silviculture; field studies of silvicultural methods. Extended field trips required.

306. Forest Fire Protection and Use
Winter of odd-numbered years. 3(2-3) Juniors or approval of department.
Causes and control of forest fires. Combustion, fire behavior and fire weather. Prevention and control planning and techniques. Fire in forest land management.

309. Wood Technology
Fall. 4(3-3)
Structure of wood. Mechanical and physical properties of wood. Wood anatomy and relation to growth.

310. Wood Structure and Properties
Spring. 3(2-2) Not open to students with credits in FOR 305.
Properties and characteristics of solid wood, plywood, particleboard and hardboard with emphasis on their use in packaging. Laboratory is concerned with wood identification and strength testing.

402. Forest Inventory
Spring. 4(2-4) FOR 301, FOR 305, FOR 424, FOR 425, FOR 429 concurrently. Field and office techniques of forest inventory, with primary emphasis on timber resources. Extended field trips required.

409. Forest Hydrology
Winter. 3(3-0) FOR 424, Seniors; or approval of department.
Hydrologic cycle, with emphasis on soil, water and ground water regimes; instrumentation and measurement of the various components. Effects of forest management on watershed 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
Winter of even-numbered years. 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.

424. Forest Soils
Spring. 4(3-3) CSS 216; Juniors or approval of department. Forestry majors: FOR 305, FOR 402, FOR 425, FOR 429 concurrently. Interdepartmental with the Department of Crop and Soil Sciences.
Interrelationships of forest site and the growth of trees. Properties, classification, inventory, productivity and management of forest soils. Effects of silvicultural and forest management practices on the soil.

425. Forest Soils Laboratory
Spring. 1(0-3) CSS 210; FOR 305, FOR 402, FOR 424, FOR 429 concurrently. Interdepartmental with the Department of Crop and Soil Sciences.
Exercises and field trips relating to properties, classification, inventory, productivity and management of forest soils. Extended field trips required.

428. Seminar
Fall. 1(1-0) Seniors.
Current forestry topics.

429. Timber Harvesting
Spring. 3(2-3) FOR 309. FOR 305, FOR 402, FOR 424, FOR 425 concurrently.
Felling, bucking and transport of trees to mill site. Capabilities and limitations of mechanical devices, vehicles, and logging systems related to timber size and terrain. Extended field trips required.

430. Industrial Timber Utilization Processes
Winter. 3(2-2) FOR 429.
Mechanics and technologies of industrial wood conversion processes, including grading logs and lumber, manufacture of furniture, plywood, particleboard, fiberboard, and paper. Field trips required.

431. Finishing, Preservation and Drying of Wood
Winter. 3(3-0) FOR 309.
Properties, selection, application of decorative and protective coatings, wood preservatives and fire retardants. Air and kiln drying of lumber.

435. Law and Resources
Fall. 3(3-0) R D 417 or GBL 430. Interdepartmental with and administered by the Department of Resource Development.
Legal theories, cases, statutes and constitutional considerations are applied to natural resource utilization. Private and public property interests in natural resources as illustrated through case studies of use conflicts.

445. Range Management
Winter of even-numbered years. 4(4-0) FOR 226 or FOR 304 or approval of department.
The science of range management, with emphasis on range regions, range vegetation management, livestock management practices, range improvements and multiple use values of range lands.

450. Natural Resource Administration
Winter. 4(4-0) Seniors not open to forestry majors. Interdepartmental with Agriculture and Natural Resources and the departments of Fisheries and Wildlife, Park and Recreation Resources, and Resource Development.

454. Forestry in International Development
Winter. 3(3-0)
Assessment of the world's forest resources, forest products industrial development and trade, and restrictions of developmental objectives on forestry goals. Issues, policy approaches, and prospects for individual countries.
455. Natural Resource Economics
Fall. 4(4-0) Approval of department. Interdepartmental with Agriculture and Natural Resources and the departments of Fisheries and Wildlife, Park and Recreation Resources, and Resource Development. Basic economic and political principles and techniques that govern the production and consumption of forest land products, including basic forest valuation procedures.

457. Forest Management I
Fall. 3(2-2) FOR 365. Managing the timber compartment. Timber management systems, compartment examination, silvicultural prescription, yield projection and economic evaluation.

459. Forest Management II
Winter. 3(2-2) FOR 457. Managing the forest property. Organization of forest properties, timber yield regulation, multiple-use planning, and administering management operations.

460. Arboriculture
Fall. 3(2-2) 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.

461. Urban Forestry
Spring. 3(0-2) FOR 460 or approval of department. Principles of urban forest management: organizational, legal, economic, cultural and environmental. Inventories, utility forestry and commercial arboriculture. Field trips required.

465. Forest and Wood Science Problems
Fall, Winter, Spring, Summer. 1 to 5 credits. Seniors with a 2.50 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. 3(3-0) Juniors. Interdepartmental with Agriculture and Natural Resources and the Department of Resource Development. 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.

504. Forest Ecology
Winter. 3(3-0) Approval of department. Theories, methods of analysis, and discussion of current investigations of energy, nutrients, and biomass dynamics in forest ecosystems.

505. Special Problems
Fall, Winter, Spring. Summer. 2 to 5 credits. May enroll for credit with a maximum of 10 credits. Approval of department. Advanced study in administration, biometrics, photogrammetry, dendrology, silviculture, management, economics, ecology, genetics, arboriculture, hydrology, soils, recreation, physiology, policy, entomology, products harvesting, wood preservation, timber mechanics, wood conversion, fire, range management, extension and pathology.

507. Natural Resources Economics
Winter. 3(3-0) Approval of department. Interdepartmental with the Department of Resource Development. Applications of economic analysis to natural resource problems.

514. Plant Breeding and Genetics Seminar
Winter. 1(1-0) May enroll for a maximum of 2 credits. Approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences.

515. Selected Topics in Plant Breeding and Genetics
Fall, Winter, Spring, Summer. 2 to 5 credits. May enroll for a maximum of 12 credits if different topics are taken. Approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences. Selected topics in plant breeding including host-plant resistance, nutrition and quality, computerized records and data analysis, classical literature and strategies for improving field, horticulture and forestry crops.

516. Special Problems in Plant Breeding and Genetics
Fall, Winter, Spring, Summer. 1 to 3 credits. May enroll for a maximum of 8 credits. Approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture. Students may conduct research in a laboratory, greenhouse or field plot on a selected subject or study selected published literature under the supervision of a faculty member.

521. Genetic Concepts in Plant Breeding
Fall. 3(3-0) CSS 250 or ZOL 441. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences. Genetic structure of plant populations, gene action, inbreeding, outbreeding, heterosis, linkage and recombination, genetic architecture of traits, genetic distance.

522. Plant Breeding Systems
Winter. 3(3-0) CSS 821, STT 422. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture. Breeding systems for improvement of self and cross pollinated and of vegetatively propagated crops. The genetic basis for parent selection.

523. Plant Breeding Methods
Spring. 3(3-0) HRT 822, STT 423. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences. Methods, strategies and practices in organization and operation of plant breeding programs. Emphasis on practical application of classical, modern and futuristic approaches to plant breeding.

528. Seminar
Fall. 1(1-0) Critical study and discussion of advanced forestry topics.

535. Silviculture
Fall. 3(3-0) FOR 365 or approval of department. Biological basis of intensive forest management including seedling production, site evaluation and preparation, plantation establishment, intermediate stand treatments and natural reproduction methods. Field trip optional.

536. Evolution of Crop Plants
Fall of even-numbered years. 3(3-0) CSS 821 or approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture. Cultural and biological aspects of evolution under domestication; origin and diversity of cultivated plants.

539. Tissue Culture for Plant Breeding
Winter of even-numbered years. 3(2-2) BOT 414, CSS 821. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture. The application of plant cell, protoplast and tissue culture methodologies and principles to crop improvement.

540. Recreation Economics
Spring. 4(4-0) FOR 380 or approval of instructor. Interdepartmental with the departments of Park and Recreation Resources, and Resource Development. Administered by the Department of Park and Recreation Resources. Applications of economic analysis to recreation resource problems including measurement of demand and supply, valuation of recreation resources, determination of economic impact, economic decision making and policy considerations.

544. Plant Organelle Genetics
Winter of odd-numbered years. 3(3-0) Approval of department. Interdepartmental with Genetics and the departments of Botany and Plant Pathology, Crop and Soil Sciences, and Horticulture. Administered by the Department of Horticulture. Organization, structure, function, heredity, molecular biology and manipulation of chloroplasts and mitochondria. Biological interactions between the nucleus and organelles.

550. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

555. The Research Process in Natural Resources
Fall. 3(3-0) Approval of department. Interdepartmental with and administered by the Department of Resource Development. Research and decision processes as applied in natural resource investigations. Research organization and applications of research results. Orientation to management, social science, and policy studies. Preparation of project proposals.
916. Resource Economics Proseminar
Spring, 3(3-0) May enroll for a maximum of 9 credits. Approval of department. Interdepartmental with the departments of Agricultural Economics and Resource Development.
A seminar wherein advanced graduate students in the fields of resource economics participate with faculty in the joint conduct of a major research project in resource economics and policy.

940. Theoretical Population Genetics
Winter of even-numbered years, 4(4-0) MTH 113, STT 422, CSS 821. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture.
Discussion of mathematical theories in population genetics and experimental works on natural and laboratory populations.

941. Quantitative Genetics in Plant Breeding
Spring of even-numbered years, 4(4-0) STT 424, CSS 823 or approval of department. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture. Administered by the Department of Crop and Soil Sciences. Control of variation in higher plants including adaptive physiology, quantitative genetics, growth-cumulation, biochemical genetics, hybrid physiology, and genecology.

944. Physiological Genetics
3(3-0) Winter of odd-numbered years. BOT 413; CSS 821. Interdepartmental with the departments of Crop and Soil Sciences, and Horticulture.
Control of variation in higher plants including adaptive physiology, quantitative genetics, growth correlation, biochemical genetics, hybrid physiology, and genecology.

960. Simulation Models in Natural Resource Management
Winter of odd-numbered years, 3(3-0) R D 555 and knowledge of FORTRAN programming or approval of department. Interdepartmental with and administered by the Department of Resource Development.
The role of simulation models in developing management strategies. Applications of computer simulation in natural resources. Modeling of decision systems in natural resource management.

976. Multivariate Methods in Forestry Research
Winter of even-numbered years, 4(4-0) MTH 334, STT 422, CPS 120. Application of multivariate techniques such as principal components, canonical analysis, factor analysis, and clustering to problems in forestry research. Case studies drawn from several forestry disciplines.

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

GENERAL BUSINESS AND BUSINESS LAW GBL
(General change effective July 1, 1984. Formerly the Department of Business Law and Office Administration.)

College of Business and Graduate School of Business Administration

341. Survey of Business Law (BOA 341.) Fall, Winter, Spring, 4(4-0) Juniors. Not open to students with majors in the College of Business.
Historical development of the law; courts, court procedures and civil remedies, torts, crimes; contracts, agency, sales, negotiable instruments, real and personal property, including bailments and liens. Textbook and lecture rather than case approach.

345. Business Ethics (BOA 345.) Fall, 4(4-0) Juniors. Interdepartmental with and administered by the Department of Philosophy.
Ethical dimensions of the relationships between business and employees, consumers, other businesses, society, government, and the law. Readings from philosophical and business sources.

400H. Honors Work (BOA 400H.) Fall, Winter, Spring, Summer. 1 to 15 credits. Approval of department.
Independent and informal study in law, office administration or business communications.

430. Law and Society (BOA 430.) Fall, Winter, Spring, Summer, 4(4-0) Juniors or approval of instructor.
Legal reasoning and legal institutions. Court systems and court procedures. Contracts and sales. Sources of and limits on legislative and judicial authority. Property, torts, and crimes.

431. Law and Business (BOA 431.) Fall, Winter, Spring, Summer, 4(4-0) GBL 430.
Law of business organizations, administrative agencies and processes, the constitution and the business enterprise, liability to consumers, securities, regulation of business conduct and structure, business ethics and social responsibility.

441. Contracts and Sales (BOA 441.) Fall, Winter, Spring, Summer, 3(3-0) Juniors or approval of instructor.
Contracts, including concept of freedom of contract, and limitations. Sales. Case study method.

442. Agency, Partnerships and Corporations (BOA 442.) Winter, Spring, 3(3-0) GBL 441.
The law dealing with agency and business organizations. Case study method.

443. Negotiable Instruments, Secured Transactions, Property (BOA 443.) Winter, Spring, 3(3-0) GBL 441.
The law of negotiable instruments, secured transactions, and property. Case study method.

447. Hotel Law (BOA 447.) Winter, Spring, 4(4-0) GBL 440.
Legal aspects of the hospitality industry.

468. Field Studies (BOA 468.) Fall, Winter, Spring, Summer, 1 to 4 credits. May enroll for a maximum of 8 credits. Approval of department.
Planned program of observation and work in selected business firms. Analysis and reports.

805. Business Ethics Spring, 4(4-0) Graduate student in the College of Business or approval of instructor. Interdepartmental with and administered by the Department of Philosophy.
The ethical dimensions of such topics as corporate responsibility, preferential hiring, profit and taxation, deception and bribery, self-regulation versus government regulation, 'whistle blowing', and advertising. Readings from philosophical and business sources.

845. The Legal Environment of Business (BOA 845.) Fall, Summer, 4(4-0)
Critical examination of the environment in which business operates. Analysis of the component elements of the legal environment of business and the structural framework in which law functions.

875. Seminar in Business Law (BOA 875.) Winter, Spring, 4(4-0) GBL 845 or approval of department.
Contracts, sales, secured transactions and consumer legislation viewed from the judicial, legislative and executive vantage points.

876. Seminar in Business Law (BOA 875B.) Spring, 4(4-0) GBL 845 or approval of department.
Agencies, partnerships and corporations, viewed from legislative, judicial and executive vantage points, as they affect entrepreneurial decision making.

890. Special Problems (BOA 890.) Fall, Winter, Spring, Summer, 1 to 12 credits. May enroll for a maximum of 12 credits. Approval of department.

GENETICS

College of Natural Science

500. Genetics Seminar Fall, Winter, Spring, 1(1-0) May enroll for a maximum of 12 credits. Approval of director.
Student seminar to cover genetics subjects not considered in formal courses. Course is also intended to give students experience in reviewing and organizing literature in a subject, and orally presenting and defending the analysis.

542. Chromosome Structure and Genetics Winter of even-numbered years, 4(4-0) Introductory genetics course. Interdepartmental with the departments of Botany and Plant Pathology, and Zoology.
Mechanisms of mitosis and meiosis, classical and molecular genetics of chromosome structure, alterations in chromosome number and structure, transposable elements, meiotic drive.

FRENCH
See Romance and Classical Languages.