Courses

801. Chemistry of Food Lipids
Fall or odd-numbered years. 3(3-0)
Description: Structure and composition of lipids; physical and chemical properties in relation to their function in foods.

802. Chemistry of Food Proteins
Spring or even-numbered years. 3(3-0)
Description: Use of proteins and enzymes in the food industry. Functional properties of proteins and enzymes in food systems.

807. Advanced Food Toxicology
Fall of even-numbered years. 3(3-0) Interdepartmental with Animal Science.
Description: Metabolism of toxins as influenced by food constituents, mutagenesis, and chemical carcinogenesis. Risk assessment.

833. Muscle and Meat Biochemistry
Spring or odd-numbered years. 3(3-0)
Description: Biochemistry of muscle structure, function, and function of muscle proteins. Regulation of muscle contraction. Post mortem biochemical changes and meat protein functionality.

837. Rheological Methods in Food Processing Engineering
Fall. 3(3-0) Interdepartmental with Agricultural Engineering, Administered by Agricultural Engineering.
Description: Definition, analysis, and measurement of rheological properties to describe the steady shear, dynamic, viscoelastic, extensional, and solid behavior of biological materials. Industrial applications of rheological methods with emphasis on fluid and semi-solid foods.

840. Advanced Food Microbiology
Spring or odd-numbered years. 3(3-0)
Description: Detection, characterization, identification, and enumeration of food-associated pathogens. Applications and regulation of food biotechnology.

850. Analytical Techniques in Food Science
Summer of odd-numbered years. 2(1-2)
Description: Theory and application of dynamic rheological testing, nucleic acid and protein analysis, and immunological techniques. Other new technologies related to food science.

860. Research in Food Processing Technology
Summer of even-numbered years. 2(1-2)
Description: Movement of livestock and products into and through market channels. Market structures, futures, options. Correct issues. Field trip required.

899. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 59 credits in all enrollments for this course.
Description: Directed research in support of Plan B master's degree requirements.

FOOD SYSTEMS ECONOMICS AND MANAGEMENT

FSM

Department of Agricultural Economics

College of Agriculture and Natural Resources

290. Introduction to Food Systems Management
Fall. 3(3-0)
Description: Organization and operation of the industrialized food system: agricultural production, food processing, manufacturing, wholesaling, retailing and consumption. Application of economic and management principles to firms and the overall food system.

310. Livestock and Product Marketing
Fall. 3(2-2) Interdepartmental with Animal Science, Administered by Animal Science.
Description: Movement of livestock and products into and through market channels. Market structures, futures, options. Correct issues. Field trip required.

320. Agribusiness and Food Sales
Spring. 3(2-2)
Description: Selling processes and activities within agribusiness and food firms. Principles and techniques of sales. Operation of sales organizations.

325. Agribusiness Labor and Personnel Management
Fall. 3(3-0)
Description: Labor for farms and agribusinesses: planning, recruiting, training, scheduling, motivating, supervising, and evaluating. Labor regulations, compensation, and records.

330. Farm Business Management
Spring. 3(2-2) Interdepartmental with Marketing and Logistics, Administered by Marketing and Logistics.

335. Food Marketing Management
Spring. 3(2-2) Interdepartmental with Marketing and Logistics, Administered by Marketing and Logistics.
Description: Analysis of agricultural business performance using financial statements. Principles and techniques of business analysis and strategic planning applied to food firms. Strategic planning, market potential, competition and cost analyses, business and strategic planning.
441. Commodity and Futures Marketing
Spring. 3(3-0)
P: FSM 200, EC 291; STT 200 or STT 201 or STT 315.
R: Not open to freshmen and sophomores.
Supply, demand and prices in commodity markets. Futures and options and their role in forward pricing. Agricultural and food markets.

442. Food Industry and Cooperative Marketing
Spring. 3(3-0)
P: FSM 200. R: Not open to freshmen and sophomores.
Multiple firm and cooperative marketing methods. Organization and operation of cooperatives, marketing orders, trade associations and other forms of group action in the food system.

462. Agricultural Development in Less Developed Countries
Fall. 3(3-0)
P: EC 201; PRM 200 recommended. R: Not open to freshmen and sophomores.
Factors responsible for agricultural growth, as well as technical and institutional change. Sustainable strategies for increasing food production and rural incomes.

490. Independent and Supervised Study
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 7 credits in all enrollments for this course.
P: FSM 200; ML 335 or FSM 330. R: Open only by FSM majors. Approval of department; application required. In-depth independent study of topics and issues affecting the food system. Complementary to previous coursework, adapted to career aspirations.

421. Forestry Descriptions of Courses

FORESTRY
Department of Forestry
College of Agriculture and Natural Resources

101. Michigan's Forests
Spring. 3(3-0)
Ecological, social and economic roles of Michigan's forests in historic and contemporary context. Geographic similarities and differences in forest resources.

201. Tenets of Forestry
Fall. 1(1-0)
R: Open only to Forestry students. Completion of Tier I writing requirement. History, founding principles, and core concepts of forestry. Stewardship, conservation, professional ethics, and current forestry issues.

202. Introduction to Forestry
Fall. Spring. 3(3-0)
Historical development of forestry. Forest growth, protection, management, and products. Relationship of national and world economy and policy to forestry. Emphasis on multiple uses of forests.

204. Forest Vegetation
Fall. 3(2-0)
Nomenclature, classification, and identification of woody plants. Tree structure as it relates to growth and ecosystem dynamics.

207. Natural Resource Data Analysis
Spring. 3(2-2)
P: CPS 100 or CPS 130 or CPS 131 or approval of department.
Quantitative analysis of natural resource data. Modeling and display of biophysical and socio-economic data related to natural resource systems.

210. Fundamentals of Soil and Landscape Science
Fall. 3(3-0) Interdepartmental with Crop and Soil Sciences. Administered by Crop and Soil Sciences.

220. Forests and the Global Environment
Fall. 3(3-0)
Relationships between forests, climatic and edaphic factors, and human influences upon forest resources. Deforestation, biodiversity, sustainable forest management and timber trade.

304. Wood Technology
Fall. 3(2-3)
P: CEM 141, PHY 231. R: Not open to freshmen and sophomores.
Structure and identification of wood. Physical and mechanical characteristics. Major industrial timber utilization processes including manufacture of lumber, furniture, composites, and paper.

306. Forest Biometry
Spring. 4(2-3)
P: MTH 118, FOR 201, FOR 204. R: Not open to freshmen and sophomores.
Describing location and area of forest resources. Quantification of site, stand, and tree characteristics. Sampling and inventory. Predicting growth and yield.

404. Forest and Agricultural Ecology
Fall. 4(3-3) Interdepartmental with Crop and Soil Sciences.
P: CSS 219, BOT 205.
Structure and function of ecosystems managed for crop and wood production. Productivity, nutrient cycling, community dynamics as affected by management intensity and natural disturbance. Dynamics of managed versus natural ecosystems.

406. Silviculture
Spring. 4(3-3)
P: CSS 210, FOR 204. R: Not open to freshmen and sophomores.

408. Forest Management
Spring. 4(3-2)
P: FOR 249. Management of forests for timber production in a multiple-use context. Yield projections, harvest scheduling, management prescriptions, project analysis and administration.

409. Forest Hydrology
Spring of odd numbered years. 3(3-3) Interdepartmental with Crop and Soil Sciences, and Resource Development.
P: CSS 210, MTH 116, CPS 100 or CPS 130 or CPS 131. R: Not open to freshmen and sophomores.
Science and technology of the hydrologic cycle and water resources in forest, wildland, wetland, and rural watersheds.

420. Forestry Field Studies
Summer. 3 credits. Offered only as W.K. Kellogg Biological Station and Manistee National Forest.
P: FOR 304, FOR 305, FOR 404, FOR 406. R: Open only to juniors and seniors in College of Agriculture and Natural Resources. Major forest management concepts. Ecology, silviculture, soils, biometry, Timber harvesting and use. Forest protection. Field trips required.

442. Woody Plant Genetics
Fall. 3(2-2)
P: BOT 105, BOT 301, CSS 350.
Applications of plant breeding and genetic principles to improve tree species and to preserve biological diversity in forest ecosystems or human benefit.

449. Law and Resources
P: RD 201; EC 201 or GBL 395. R: Not open to freshmen and sophomores.
Legal principles applied to natural resource use. Sovereignty, property rights, land and water use, jurisdiction, public trust doctrine, fish and game law, mineral rights, and eminent domain. Case and statutory law analysis.

451. Cellular and Molecular Principles and Techniques for Plant Sciences
Spring. 3(2-0) Interdepartmental with Sociology.
P: FOR 404 or FOR 464. R: Open only to seniors and graduate students.
Biophysical, social and economic factors influencing design and implementation of farm, village and community level forestry and agroforestry projects.

452. Plant Breeding and Biotechnology
P: CSS 350 or ZOL 341.
Principles, concepts, and techniques of agricultural plant biotechnology. Recombinant DNA technology, plant molecular biology, transformation, cell tissue, and organ culture in relation to plant improvement.

459. Arboriculture
Fall. 3(2-2)
P: BOT 105, FOR 204, or HRT 211. R: Not open to freshmen and sophomores.
Tree selection and planting to fit climatic, space and edaphic conditions. Diagnosing tree abnormalities. Cultural practices used in the care and maintenance of shade and ornamental trees. Field trip required.

461. Urban Forestry
Spring. 3(3-0)
P: FOR 204 or HRT 211. R: Not open to freshmen and sophomores.
Trees in improving the urban environment. Principles of urban forest management: legal, economic, organizational, and cultural. Street tree planning and inventory systems, city forestry and commercial arboriculture. Field trips required.

464. Natural Resource Economics and Social Science
Fall. 3(2-2) Interdepartmental with Park and Recreation Resources, Fisheries and Wildlife, and Resource Development.
P: EC 201 or EC 202. R: Not open to freshmen and sophomores.

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