Courses subject to revision and final approval.

FOOD SCIENCE

433*. Advanced Food Processing: Meat/Poultry/Fish
Fall of even-numbered years. 3(2-3)
Scientific principles of processing animal tissues for food. Field trips required.
QP: FSC 345 QA: FSC 445

436*. Quality Assurance
Fall. 2(2-0)
P: Two of the following: FSC 331, FSC 332, FSC 333, FSC 334; STT 201 R: Junior and above
Theory and application of quality assurance programs for food processing industries.
QP: STT 201 FSC 330 QA: FSC 457

440*. Food Microbiology
Spring. 3(3-0) Interdepartmental with the Department(s) of Microbiology and Public Health.
P: MPH 206 R: Juniors and above
Major groups of microorganisms of importance to the food industry. Isolation, enumeration, characterization, identification and utilization of microorganisms.
QP: MPH 200 OR MPH 301 QA: FSC 440 OR MPH 440

441*. Food Microbiology Laboratory
Spring. 10(0-3) Interdepartmental with the Department(s) of Microbiology and Public Health.
P: FSC 433 R: Juniors and above
Methods for studying major groups of microorganisms of importance to the food industry. Isolation, enumeration, characterization, identification and utilization of microorganisms.
QP: FSC 440 QA: FSC 441 OR MPH 441

455*. Food Analysis
Fall. 2(2-3)
P: BCH 200, CEM 362, FSC 401 R: Not open to freshmen and sophomores.
Principles and application of analytical techniques. Analysis for fats, proteins, carbohydrates, minerals, vitamins and additives. Techniques include spectrophotometry, fluorometry, electrophoresis, proximate composition.
QP: CEM 162 CEM 241 FSC 335 QA: FSC 455 FSC 458

490*. Special Problems in Food Science
Fall, Spring. 1 to 3 credits.
May reenroll for a maximum of 6 credits.
R: Not open to freshmen and sophomores.
Approval of department; application required.
QP: FSC 490

492*. Senior Seminar in Food Science
Spring. 1(1-0)
R: Open only to seniors in Food Science.
Critical study and discussion of contemporary issues related to the food industry.
QP: FSC 490

801*. Chemistry of Food Lipids
Spring. 2(2-0)
P: FSC 401, 402, BCH 451 or approval of Department R: Level 6 or above
An in-depth course on composition and structure of lipids, and their physical and chemical properties in relation to their function in foods.
QP: FSC 333 FSC 333L BCH 453 QA: FSC 862

840*. Advanced Food Microbiology
Spring of odd-numbered years. 2(2-0)
P: FSC 440, or approval of Department R: Level 6 or above
Recent advances in the microbiology of food production and processing including the detection, characterization, identification and enumeration of food associated pathogens; current/future applications and regulation of Food Biotechnology.
QP: FSC 440 APPROVAL DEPT. QA: FSC 852

850*. Analytical Techniques in Food Science
Summer of odd-numbered years. 2(2-4)
P: MPH 6 or above Agriculture and Natural Resources; Human Ecology Food Science or Human Nutrition
Laboratory and recitation experience focused on recent advances in analytical methodologies with applications to food systems.
QP: NONE QA: NONE

860*. Processing Research in Food Science
Summer of odd-numbered years. 2(2-4)
P: Level 6 or above
Laboratory and recitation experience focused on recent advances in basic research and current process technology in applied food research.
QP: NONE QA: NONE

899*. Master's Thesis Research
Fall, Spring, Summer. 1 to 4 credits.
May reenroll for a maximum of 10 credits.
P: Approval of department R: M.S. students in Food Science
Individual research focused on the student's M.S. thesis.
QP: APPROVAL DEPT. QA: FSC 899

901*. Food Proteins
Fall of even-numbered years. 2(2-0)
P: BCH 461; FSC 401 or approval of Department R: Level 6 or above
Utilization and application of proteins and enzymes in the food industry. Functional properties of proteins and enzymes in food systems.
QP: BCH 452 FSC 335 QA: NONE

913*. Advanced Food Toxicology
Spring of odd-numbered years. 2(2-0)
Interdepartmental with the Department(s) of Animal Science.
P: Departmental approval R: Level 6 and above
Concepts in toxicology related to food safety. Metabolism of toxicants as influenced by food constituents, mutagenesis, chemical carcinogenesis; risk assessment.
QP: BCH 452 QA: FSC 861

999*. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 6 credits.
May reenroll for a maximum of 30 credits.
P: Approval of Department R: Ph.D. students in Food Science
Individualized research focused on student's doctoral dissertation.
QP: APPROVAL DEPT. QA: FSC 999

FOOD SYSTEMS

ECONOMICS AND MANAGEMENT

200. Introduction to Food Systems Management
Fall. 3(3-0)
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.
QP: FSM 200

320. Agribusiness and Food Sales
Spring. 3(3-0)
P: FSM 200 or MFA 300 R: Not open to freshmen and sophomores.
Selling processes and activities within agribusiness and food firms. Principles and techniques of sales. Operation of retail and wholesale organizations.
QP: FSM 200 MFA 300

335. Agribusiness Labor and Personnel Management
Fall. 3(3-0)
P: FSM 200 or MGT 302 or concurrently.
Labor for farms and agribusinesses: planning, recruiting, training, scheduling, supervising, and evaluating. Labor regulations, compensation, and records.
QP: FSM 200 OR MGT 302

330. Farm Business Management
Fall. 3(3-0)
P: FSM 200 R: Not open to freshmen.
Management, planning, and control of farm production, marketing and financial activities. Problems and evaluation of alternative solutions. Economic principles, budgeting, financial statements.
QP: FSM 200 QA: FSM 330 FSM 430

412*. Financial Management in the Food System
Spring. 3(3-0)
P: FSM 330, FSC 391 R: Not open to freshmen and sophomores.
QP: FSM 330 QA: FSM 412 FSM 430

421*. Public Policy Issues in Food and Agribusiness
Spring. 3(3-0)
P: EC 201, FSM 200 R: Not open to freshmen and sophomores.
Objectives, rationale, and consequences of public policy for food and agriculture. Analysis of economic implications for food and agribusinesses, farmers, consumers, and society.
QP: EC 201 FSM 200 QA: FSM 421
FOOD SYSTEMS ECONOMICS AND MANAGEMENT

Courses are subject to revision and final approval.

429*. Agribusiness Management
Spring. 3(3-0)
P: FSM 330. R: Open only to seniors and graduate students.
Analysis of agribusiness management functions including planning, organizing, and controlling. Integration of production marketing, and financial aspects of agribusiness. Solutions to agribusiness managerial problems.
QP: FSM 200

431*. Commodity and Futures Marketing
Spring. 3(3-0)
P: FSM 200, STT 201, EC 201, 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.
QP: STT 201 EC 201 FSM 200 QA: FSM 441

443*. 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, transactions and other forms of group action in the food system.
QP: FSM 200 QA: FSM 443

462*. Agricultural Development in Less Developed Countries
Fall. 3(3-0)
P: EC 201; PAM 260 recommended. R: Not open to freshmen and sophomores.
Factors responsible for agricultural growth, as well as economic and institutional change. Sustainable strategies for increasing food production and rural incomes.
QP: EC 201 QA: FSM 462

490*. Independent and Supervised Study
Fall. 1-3
R: Open only to 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.
QP: FSM 200 FSM 3350 OR FSM 330 QA: FSM 490

FORESTRY FOR

201*. Tenets of Forestry
Fall. 1(1-0)
R: Open only to Forestry majors. 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.
QA: FOR 202

204. Structure and Function of Woody Plants
Fall. 4(3-2)
Nomenclature, classification, and identification of woody plants. Tree structure as it relates to growth and ecosystem dynamics.

220. Plants and their Environment
Spring. 3(3-0)
Relationship between plants and fundamental climatic, edaphic, and biotic factors. Structure and function of different ecosystems in relation to environmental factors.

304*. Wood Technology
Fall. 3(2-1)
P: CEM 141, MTH 116, 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 timber, furniture, composites, and paper.
QP: PHY 237 CEM 141 MTH 111 QA: FOR 209 FOR 430 FOR 431

306*. Forest Biometry
Spring. 4(3-2)
P: MTH 111 AND FOR 201 AND FOR 204
R: Juniors and above.
Describing location and area of forest resources. Quantification of site, stand, and tree characteristics. Sampling and inventory. Predicting growth and yield.
QP: MTH 111 QA: FOR 320 FOR 420

404. Forest and Agricultural Ecology
Fall. 4(3-2) Interdepartmental with the Department(s) of Crop and Soil Sciences.
P: CEG 210, BOT 105. R: Not open to freshmen and sophomores.
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.
QA: FOR 304 QA: 412

406*. Silviculture
Spring. 4(3-2)
P: CEG 210, FOR 204. R: Not open to freshmen and sophomores.
QP: FOR 204 CEG 210 QA: FOR 305

408*. Forest Management
Fall. 3(3-0)
P: FOR 204
Management of forests for timber production in a multi-use context. Yield projections, harvest scheduling, management prescription, project analysis and administration.
QP: FOR 305 FOR 455 QA: FOR 458

409*. Watershed Hydrology
Spring. 3(3-0)
Interdepartmental with the Department(s) of Crop and Soil Sciences, Resource Development, Geography.
P: CEG 210, MTH 116, CEG 100 or CPS 130 or CPS 131. R: Juniors and above
Science and technology of the hydrologic cycle and water resources in forest, woodland, wetland and rural watersheds.
QP: CEG 210 MTH 108 CPS 1000 OR CPS 115 QA: FOR 499

420*. Forestry Field Studies
Fall. Summer. 3(3-0)
P: FOR 306 AND FOR 304 AND FOR 304 R: Junior or senior CAR
Major field management concepts: Developing forest ecology, silviculture, forest soils, biometry, timber harvesting and utilization, and forest protection.
Field trip required.
QP: FOR 204 FOR 320 FOR 305 OR FOR 305 FOR 320 FOR 304

422*. Woody Plant Genetics
Fall. 3(2-2)
P: BOT 105, BOT 201, CSS 250
Applications of plant breeding and genetic principles to achieve improvement of tree species and to preserve biodiversity in forest ecosystems for the benefit of mankind.
QP: BOT 205 BOT 301 QA: FOR 410

450*. Forestry in International Development
Fall. 4(4-2) Interdepartmental with the Department(s) of Sociology.
P: FOR 404 or FOR 464 R: Seniors and above
Basic biophysical, social and economic factors influencing design and implementation of economic growth, rural and community level forestry and agroforestry projects.
QA: FOR 464 QA: 474

469*. Arboreulture
Fall. 3(3-2)
P: BOT 105; FOR 204, OR HRT 211. R: Not open to freshmen and sophomores.
Tree selection and planting to fit climatic, spatial and edaphic conditions. Diagnosing tree abnormalities. Cultural practices used in the care and maintenance of shade and ornamental trees. Field trip required.
QP: FOR 204 BOT 206 QA: FOR 460

461*. Urban Forestry
Fall. 3(3-2)
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. Utility forestry and commercial arboriculture. Field trip required.
QP: FOR 202 OR HRT 211 QA: FOR 461

464*. Natural Resource Economics and Social Science
Fall. 3(2-2) Interdepartmental with the Department(s) of Fisheries and Wildlife, Resource Development.
P: One EC course at 200 level R: Juniors and above
Basic economic and social science principles and techniques that govern human consumption and production of natural resources, including benefit-cost analysis, regional impact analysis, and social impact assessment.
QP: EC 201 OR EREC 202 QA: FOR 455

466*. Natural Resources Planning and Policy
Spring. 3(2-2) Interdepartmental with the Department(s) of Fisheries and Wildlife, Park and Recreation Resources, Fisheries and Wildlife, Resource Development.
P: HRT 408, 409 or FW 434 or FW 472 or PRR 443 or RD 415 or RD 460 R: Seniors and above
Planning and policy-making in the context of scientific, environmental, social and institutional factors. Focus on ecosystem-based planning & policy issues through development of a multiple-use plan and use of case studies.
QP: FOR 455 OR RDR 417 QA: FOR 466 FOR 491

490*. Independent Study in Forest and Wood Science
Fall. Spring. Summer. 1 to 3 credits. R: May enroll for a maximum of 8 credits.
R: Open only to juniors and seniors.
Approval of department.
Special problems course for students qualified for advanced study in some phase of forestry or wood science.
QA: 465

Courses with an asterisk (*) have not been approved by the University Committee on Curriculum. E-71