

**444. Interpersonal Relations Within the Home**

Fall, Spring. Summer of even-numbered years. 3(3-0) 261 or approval of department.

Develops an understanding of the dynamics of the various relationships within families. Planned to meet personal needs as well as preparation for those entering professions related to the family-life field. Current family-life literature.

**446. Approaches to Studying the Family**

Fall, Winter. Summer of odd-numbered years. 3(3-0) 145; S S 233; PSY 151 or ED 200, or approval of department.

Course to increase understanding of human relations in families and other small groups, and of one's self in a group. Readings, case studies, literary materials, films, and observations of living situations are included.

**461. Growth and Behavior of the Individual Child**

Fall, Winter. 3(2-2) Majors: 364; others: 362 or PSY 345 or ED 312.

Child's progress as he interacts with his environment followed through observations in nursery school and at home and through use of nursery school records. Various measuring and summarizing devices.

**463. Physical Development of Children**

Winter. 4(3-2) 362 or ED 312; F N 102.

Growth patterns and factors influencing them. Experimental evidence of nutritional requirements.

**464A. Participation in the Nursery School I**

Fall, Winter, Spring. Summer of odd-numbered years. 3 to 6 credits. Majors: 364, 369; others: 362 or ED 312 and approval of department; 463 concurrently.

**467. Nursery School Administration**

Spring. 3(2-3) 464A or concurrently.

Housing and equipment, costs, staff, program, health protection, and community relations. School planning and organization.

**468. Nursery School and Parent Education**

Fall, Winter, Spring. Summer of odd-numbered years. 3 credits. Majors: 364, 369; others: 362 or ED 312 and approval of department; 464A concurrently.

Recognizing and planning for learning experiences for children in nursery school program and methods of working with parents.

**495. Independent Study**

Fall, Winter, Spring, Summer. 4 to 12 credits. May-re-enroll for a maximum of 12 credits. Approval of department.

Study of a selected topic under the guidance of a faculty adviser in the area of specialty.

**498. Field Study**

Fall, Winter, Spring, Summer. 4 to 12 credits. May-re-enroll for a maximum of 12 credits. Approval of department.

Study in off-campus situations in a variety of ways using involvement in volunteer, governmental or business-sponsored community service agencies to further insights into interaction among the individual, the family and the community.

**800A. Seminar in Home Management and Economics of the Family**

Fall, Winter, Spring. Summer of even-numbered years. 2(2-0) May re-enroll for a maximum of 8 credits. Approval of department.

**800B. Seminar in Family Life and Child Development**

Fall, Winter, Spring. 2(2-0) May re-enroll for a maximum of 8 credits. Approval of department.

**810. Workshop**

Summer. Variable credit. Approval of department.  
Content varies depending on nature of workshop.

**813A. Special Studies in Home Management and Economics of the Family**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**813B. Special Studies in Family Life and Child Development**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**819. Research Methods**

Winter. 3(3-0) Approval of department. Interdepartmental and jointly administered with the Textiles, Clothing and Related Arts Department.

**830. Individual Readings**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**832. Theories of Management and Decision-Making in the Family**

Winter of odd-numbered years. 4(2-1)

331. Comparative study of conceptual frameworks of family decision-making and of interrelated decisions, including both individual and social choices.

**837. Allocation of Family Resources**

Spring of even-numbered years. Summer of odd-numbered years. 4(4-0) 437, 438. Contributors to and recipients of family resources both human and non-human. Patterned use of resources and the effect of definite factors such as standard of living on those patterns.

**838. Analysis of Family Income**

Spring of odd-numbered years. Summer of even-numbered years. 3(3-0) 438. Forms of family income and economic problems relative to the protection of family economic security through insurance and investments, property rights and descent of property, and estate planning.

**862. Advanced Child Study**

Spring. Summer of odd-numbered years. 3(3-0) 362 or ED 312 or approval of department.

Current trends in field of child development based on research and on significant new books. Careful observations of children in a variety of informal situations will be made within the limits of available resources.

**899. Research**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**932. History and Philosophy of Home Management**

Fall. Summer of even-numbered years. 3(2-0)

History and development of home management as a field of study. Values and decision-making as analyzed by various disciplines and as used in home management.

**933. Apprentice Experience in Home Management Residence**

Fall, Winter, Spring. 3(1-6) 437 and approval of department.

Experience in presenting home management as a resident course. Each student works with one home management group. Limited to a few well-qualified students.

**999. Research**

Fall, Winter, Spring, Summer. Variable credit.

Research in home management and economics of the family.

**FISHERIES AND WILDLIFE**

F W

**College of Agriculture and Natural Resources**

**200. Resource Ecology and Man**

For course description, see Interdisciplinary Courses.

**301. Fish and Wildlife of North America**

Winter. 5(3-4) N S 192 or B S 212. Comparative study of fish and wildlife groups in North America, their significant life history stages, morphology, migrations, habitats and populations. Common species are identified in the laboratory.

**305. Management of Fish and Wildlife Resources**

Winter. 3(3-0) IDC 200 or other ecology course.

Effects of regulations, refuges, stocking, species introductions, habitat manipulation, artificial feeding, genetic improvement, land use, ecological research and control of predators, diseases and competitors in the production of fish and game.

**374. Biological Oceanography**

(474.) Winter. 3(3-0) N S 193 or B S 212.

Biology of marine animals, with emphasis on physical, chemical and biological factors affecting their abundance and distribution.

**402. Conservation Education**

Winter. 4(3-2) Elementary education juniors.

Nature, distribution, abundance and interrelationships of natural resources. Includes principles of resource use, study of natural objects and techniques of teaching conservation. Special emphasis on biological and physical components of field, range and forest.

**403. Conservation Education**

Spring. 4(3-2) Elementary education juniors.

A continuation of 402. Special emphasis afforded lakes, streams, and wetlands.

**404. Fisheries and Wildlife Problems**

Fall, Winter, Spring. 1 to 5 credits. May re-enroll for a maximum of 12 credits. B S 212; 6 credits of fisheries and wildlife; approval of department.

To give undergraduate majors an opportunity to study special topics in fisheries and wildlife.

**424. Wildlife Population Analyses**  
Fall. 4(3-2) 305 or approval of department.  
Population mensuration; reproductive and survival rates; sex and age determination; handling and marking methods.

**425. Wildlife Habitat Analyses**  
Spring. (2-4) BOT 450 or ZOL 389 or FOR 220.  
Evaluation of environmental factors affecting wildlife species; food and cover measurements. Determination of limiting factors.

**426. Migratory Wildlife Resources**  
Fall. 4(2-4) 424 or approval of department.  
Biology and management of doves, waterfowl and marsh birds.

**427. Resident Wildlife Resources**  
Winter. 4(2-4) 424 or approval of department.  
Ecology and management of resident wildlife on farm, forest and range lands.

**450. Natural Resource Administration**  
Fall, Winter. 4(4-0) Interdepartmental with the Forestry, Park and Recreation Resources, and Resource Development Departments and administered by the Forestry Department.  
Concepts and methods of economics and administration and application of techniques to management of wildlands.

**471. Ichthyology**  
Spring. 3(2-3) ZOL 305 or 315. Interdepartmental with and administered by the Zoology Department.  
Classification and natural history of fishes. Emphasis on food, game, and forage fishes.

**473. Fishery Biology and Management**  
Fall. 5(3-3) ZOL 471.  
Special reference to distribution and natural history, and application of this knowledge to problems of obtaining maximum return from fishery resources.

**476. Limnology**  
Winter. 3(3-0) B S 212. Interdepartmental with the Zoology Department.  
Ecology of lakes and streams with special reference to physical, chemical, and biological factors affecting their productivity.

**477. Limnological Methods**  
Winter. 3(0-9) 476 concurrently; ZOL 481; ENT 301, 302 recommended. Interdepartmental with the Zoology Department.  
Methods and instruments of limnological field investigation on lakes and streams.

**484. Advanced Conservation Education**  
Fall of odd-numbered years. 4(3-2) Approval of department.  
Designed for secondary teachers. Areas of outdoor education, school camping, recreation, biology teaching and camp counseling. This course will offer both content and methods applicable to people working in specified types of jobs.

**801. Seminar in Fisheries and Wildlife**  
Fall, Winter, Spring. 1(1-0)  
Graduate problems and current developments of importance.

**802. Advanced Topics**  
Fall, Winter, Spring. 1 to 6 credits. May re-enroll for a maximum of 15 credits. Approval of department.  
Study of selected advanced topics in detail and depth.

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

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

## FOOD SCIENCE FSC

### College of Agriculture and Natural Resources

**211. Introduction to Food Science**  
Spring. 3(3-0)  
Modern food processing, world food problems, and the basic characteristics of processed foods.

**242. Meats, Poultry and Fishery Products I**  
Fall. 3(2-2) Interdepartmental with the Animal Husbandry Department.  
Principles of evaluation and nutritive value. Identification of grades and cuts of beef, pork, lamb and poultry products.

**300. Dairy Products I**  
Spring. 3(2-2) For non-agricultural students.  
Composition, use, classification and market grades, methods of storage and factors affecting keeping quality of dairy products.

**331. Food Processing I: Physical Principles**  
Fall. 4(3-3) 211; MTH 109; PHY 239 or approval of department.  
Food preservation by heat, low temperature, dehydration and radiation.

**332. Food Processing II: Biological Principles**  
Winter. 4(3-3) 211; MPH 200 or approval of department.  
Sanitation and control of microbiological problems involved in processing and storage of foods.

**333. Food Processing III: Chemical Principles**  
Spring. 4(3-3) 211 and CEM 241 or approval of department.  
Chemical changes in foods that affect the texture, color, flavor, odor, stability, and nutritive quality during processing and storage.

**348. Meat, Poultry and Fishery Products II**  
Winter of odd-numbered years. 3(1-6) 242.  
Selection and utilization of meat, poultry and fishery products for institutional use.

**400. Dairy Products II**  
(304.) Fall. 4(3-3) CEM 132 or approval of department.  
The fluid milk industry. Composition, quality, sanitation, nutritive value, processing, packaging and distribution of milk and milk products.

**401. Industrial Food Fermentations**  
Spring. 3(3-0) 440 and organic chemistry or approval of department.  
Physical, microbiological and chemical procedures in utilizing microbial cultures in controlled fermentations of foods and food constituents.

**402. Processing of Lipids**  
Winter. 3(2-3) 333 or CEM 241 or approval of department.  
Refining, hydrogenation, and interesterification of fats and oils. Processing of margarine, butter, shortenings and salad oils. Control of rancidity and other quality factors.

**404. Dehydrated Foods**  
Spring. 3(2-3) 331; 333 concurrently or approval of department.  
Concentration and dehydration of foods by roller, spray, and freeze drying and foam, puff and tunnel drying. Stability and nutritional aspects of dehydrated foods.

**405. Dairy Products III**  
Winter. 3(2-3) May re-enroll for a maximum of 6 credits if a different topic is taken. 400 or approval of department.  
Physical, chemical and microbiological factors in the processing of dairy products. Ice cream, sherbets, ice milks and special frozen desserts are studied in odd-numbered years; cheese, and related dairy products in even-numbered years.

**421. Food Plant Management**  
Spring. 3(2-3) Seniors or approval of department.  
Efficiency concepts, merchandising, personnel utilization and organization.

**440. Food Microbiology**  
(MPH 371.) Spring. 4(2-6) MPH 200 or MPH 401, or approval of department. Interdepartmental with the Microbiology and Public Health Department.  
Major groups of microorganisms of importance to the food industry are studied with emphasis on ecological, physiological, and public health aspects.

**445. Meat, Poultry and Fishery Products III**  
Spring. 3(1-6) 333 or approval of department.  
Processing, formulation and quality control.

**448. Fruit, Vegetable and Cereal Products I**  
Fall. 4(3-3) 331 or approval of department.  
Quality factors involved in canning, sugar and salt preservation and milling.

**449. Fruit, Vegetable and Cereal Products II**  
Winter. 4(3-3) 331 or approval of department.  
Quality factors involved in cooling, freezing and other preservation procedures.