176. Applied Limnology
Spring of even-numbered years. 3(0-0)
2: Open only to graduate students in the College of Agriculture and Natural Resources, Engineering, and Natural Science.
Applies aquatic ecology. Quantitative relationships between physical, chemical, and biological parameters in polluted and unpolluted lakes.

177. Fish Population Dynamics
Fall of even-numbered years. 3(3-2)
2: Open only to graduate students in the College of Agriculture and Natural Resources or College of Natural Science.
Quantitative analysis of fish populations. Evaluation, causes, and impacts of the rates of change in survival, growth, reproduction, and recruitment for fish populations and their yield.

178. Dynamics of Trace Contaminants in Aquatic Systems
Spring of even-numbered years. 3(3-0)
2: Open only to graduate students in the Colleges of Agriculture and Natural Resources, Engineering, Human Medicine, Veterinary Science, and Veterinary Medicine.
Chemical and environmental parameters controlling movement and disposition of trace contaminants in aquatic environments. Fate models.

179. Advanced Limnology
Spring of odd-numbered years. 3(3-0)
2: Open only to graduate students in the Colleges of Agriculture and Natural Resources, Engineering, and Natural Science.
Physical, chemical, and biological processes affecting productivity of aquatic ecosystems.

181. Advanced Topics
Fall, Spring, Summer. 2 to 4 credits. A student may earn a maximum of 10 credits in all enrollments for this course.
A depth study of advanced topics in fisheries and wildlife.

192. Biodiversity
Spring. 2(2-0) A student may earn a maximum of 4 credits in all enrollments for this course. Interdepartmental with Zoology. Administered by Zoology.
Zool 580. Status of world biota and factors in the decline and extinction of major groups of plants and animals. Theory and design of natural reserves. Assessment and ecological meaning of diversity. Management for global and local diversity.

193. Seminar in Fisheries and Wildlife
Fall, Spring. 1(1-0) A student may earn a maximum of 7 credits in all enrollments for this course.
Study and research in advanced problems and current development in fisheries and wildlife.

197. Community and Ecosystem Ecology
Spring. 4(4-0) Interdepartmental with Zoology and Botany and Plant Pathology. Administered by Zoology.
Structure and function of natural communities and ecosystems. Community analysis along environmental gradients. Succession, food web analysis, energy flow, nutrient cycling, and effects of human activities on ecosystems.

198. Master's Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 10 credits in all enrollments for this course.
2: Open only to graduate students in Fisheries and Wildlife.
Master's degree Plan B research paper.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
2: Open only to graduate students in Fisheries and Wildlife.

943. Techniques of Analyzing Unbalanced Research Data
Spring. 4(4-0) Interdepartmental with Animal Science, Zoology, Crop and Soil Sciences, and Agriculture. Administered by Animal Science.
P: STT 464. R: Open only to graduate students in the College of Agriculture and Natural Resources.
Linear model techniques to analyze research data characterized by missing and unequal number of observations in classes. Simultaneous consideration of multiple factors. Estimable comparisons. Hypothesis testing. Computational strategies. Variance and covariance components. Breeding values.

976. Multivariate Methods in Agriculture and Natural Resources
Spring. 4(4-0) Interdepartmental with Forestry, Crop and Soil Sciences, and Agriculture. Administered by Forestry.
P: STT 642, MTH 374. R: Open only to graduate students in the College of Agriculture and Natural Resources and in the Interdepartmental Graduate Specializations in Ecology and Evolutionary Biology.
Application of multivariate methods to research problems. Hotelling’s T-test; profile analysis; discriminant analysis. Canonical correlation, principal components, principal coordinates, correspondence analysis, and cluster analysis.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
2: Open only to Doctoral level graduate students in Fisheries and Wildlife.

FOOD SCIENCE

Department of Food Science and Human Nutrition
College of Agriculture and Natural Resources
College of Human Ecology

160. Introduction to Nutrition and Food Science
Fall, Spring, Summer. 3(3-0) Interdepartmental with Human Nutrition and Foods. Administered by Human Nutrition and Foods.
Nutrition needs in life stages from a human ecological perspective. Domestic and international factors affecting the availability of a safe, nutritious food supply. Relationships of food choices to health and disease.

211. Principles of Food Science
Fall. 3(0-0)
P: CEM 141.
Scientific principles, historical perspective and current status of technology related to food composition, safety, toxicology, processing, preservation and distribution.

275. Seafood Systems Management
Spring. 3(3-0) Interdepartmental with Animal Science and Fisheries and Wildlife. Administered by Fisheries and Wildlife.
Domestic and international perspectives on major aquatic foods. Cultural and nutritional value: wild harvest; aquaculture; processing technology; food handling and food safety.

329. Fundamentals of Food Engineering
Spring. 3(3-0) Interdepartmental with Food Engineering. Administered by Food Engineering.
P: FSC 211, MTH 124, PHY 231. R: Not open to freshmen.
Quantitative relationships of chemical changes in foods during processing and storage affecting texture, color, flavor, stability and nutritive qualities. Thermal process calculations.

330. Food Processing: Fruits and Vegetables
Fall. 3(3-0)
P: MTH 116, FSC 211. R: Not open to freshmen.

351. Food Processing: Cereals
Fall. 3(3-0)
P: MTH 116, FSC 211. R: Not open to freshmen.

FOOD SCIENCE—Descriptions of Courses
405. Application of Biotechnology to Food Science
P: MIC 205 or MIC 301.
Spring. 3(3-0)
Advisors: P. BCH 200 or BCH 401. R: Not open to freshmen and sophomores.

407. Food Analysis
Fall. 3(3-0)
Interdepartmental with Animal Science.
Food analysis and fractionation techniques. Preparation relating to food industry. Isolation, enumeration, characterization, identification and use of microorganisms.

407L. Toxicology Methods Laboratory
Fall. 2 credits.
Interdepartmental with Animal Science.
P: Administered by Animal Science. P: ANS 401 or concurrently. R: Not open to freshmen and sophomores.
Laboratory techniques for evaluating potential toxicity of chemicals to living systems. Field trip to industrial toxicology laboratory required.

417. Topics in Toxicology
Spring. 1(1-0)
Interdepartmental with Animal Science.
Selected topics including regulatory toxicology, risk assessment, and safe handling of toxic substances.

420. Quality Assurance
Fall. 2(2-0)
P: STT 201; FSC 330 or FSC 331 or FSC 332 or FSC 333.
Theory and application of quality assurance programs for food processing industries.

421. Food Laws and Regulations
Spring. 3(3-0)
P: HNF 150 or HNF 311 or FSC 211. R: Not open to freshmen and sophomores.
Adoption, interpretation and enforcement of laws and regulations governing food processing and food service systems. Impact of regulation on food production, availability, marketing, and safety.

432. Advanced Food Processing: Dairy Foods
Fall of odd-numbered years. 3(3-0)
P: FSC 205. R: Not open to freshmen and sophomores.
Theoretical principles of the manufacture of cheese, milk desserts, butter and powders. Concentration and fractionation techniques for producing dairy ingredients for food systems.

433. Advanced Food Processing: Meat, Poultry and Fish
Fall of even-numbered years. 3(3-0)
P: FSC 333. R: Not open to freshmen and sophomores.
Scientific principles of processing animal tissues for food. Field trips required.

440. Food Microbiology
Spring. 3(3-0)
Interdepartmental with Microbiology.
P: MIC 205. R: Not open to freshmen and sophomores.
Major groups of microorganisms important to the food industry. Emphasis on ecological, physiological, and public health aspects.