

FOOD SCIENCE

FSC

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

- 120 What's for Dinner: Science on Your Plate**
Fall, Spring. 1(2-0) Not open to students with credit in FSC 229.

Relationship between science and food. Current issues and future challenges in food science. Impact of technology, government, consumers and the media.

- 211 Principles of Food Science**
Fall, Spring. 3(3-0)

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.

- 320 Muscle Foods**

Spring. 3(2-3) Interdepartmental with Animal Science. Administered by Animal Science. P:M: ANS 210 or FSC 211 or HNF 150

Structure of muscle. Meat technology and merchandising concepts.

- 325 Food Processing: Unit Operations**

Fall, Spring. 4(2-6) P:M: (ANS 210 or FSC 211) or completion of Tier I writing requirement SA: FSC 229, FSC 339

Principles, technologies, and applications in conversion of raw products into high quality foods. Unit operations: thermal processing, irradiation, freezing, membrane fractionation, enzyme technologies, dehydration and refrigeration.

- 329 Fundamentals of Food Engineering**

Spring. 3(3-0) Interdepartmental with Biosystems Engineering. Administered by Biosystems Engineering. P:M: FSC 325 and (MTH 126 or LBS 118) and (PHY 231 or LBS 271) RB: FSC 211 SA: FE 329

Unit operations in food industry: fluid mechanics, heat transfer, rate processes, refrigeration, freezing, and dehydration. Thermal process calculations.

- 342 Food Safety and Hazard Analysis Critical Control Point Program**

Fall. 3(3-0) RB: ((FSC 211 or concurrently) or (HNF 150 or concurrently) or (HNF 311 or concurrently)) or a prior or concurrent basic course in microbiology, chemistry or biological sciences. SA: FSC 442

Sources of microbiological, chemical and physical hazards; minimizing microbial growth and survival; good manufacturing, cleaning and sanitation practices; Hazard Analysis Critical Control Point Programs in food processing and food service.

- 401 Food Chemistry**

Fall. 3(3-0) P:M: BMB 200 or CEM 352 or (BMB 401 or concurrently) R: Not open to freshmen or sophomores.

Organic and biological reactions of food constituents. Chemical changes in foods during processing and storage affecting texture, color, flavor, stability, and nutritive qualities.

- 402 Food Chemistry Laboratory**

Fall. 1(0-3) P:M: (FSC 401 or concurrently) and completion of Tier I writing requirement
Chemical changes in food constituents which affect stability of food products and properties such as color, flavor and texture.

- 420 Quality Assurance**

Fall. 2(2-0) P:M: (STT 200 or STT 201 or STT 231 or STT 315 or STT 351) and ((FSC 211 or concurrently) or (ANS 210 or concurrently) or (HRT 204 or concurrently)) R: Open only to juniors or seniors or graduate students in the Department of Food Science and Human Nutrition or in the Food Processing and Technology Specialization.

Theory and application of quality assurance programs for food processing industries.

- 421 Food Laws and Regulations**

Spring. 3(3-0) P:M: HNF 150 or HNF 311 or FSC 211 or FIM 100

Adoption, interpretation, and enforcement of laws and regulations governing food processing and foodservice systems. Impact of regulation on food production, availability, marketing, and safety.

- 423 Functional Foods and Human Health**

Spring of even years. 3(3-0) P:M: {HNF 150 or (HNF 311 or concurrently)} and (MMG 205 or MMG 301 or FSC 342) and ((BMB 200 or concurrently) or (BMB 401 or concurrently))

Concept, nature and classification of functional foods. Spectrum of biological activity. Positive and negative impacts on health, and regulatory aspects.

- 430 Food Processing: Fruits and Vegetables**

Fall. 3(2-3) P:M: FSC 211 R: Not open to freshmen or sophomores. SA: FSC 330

Fruit and vegetable composition and quality indices. Harvest technology, post-harvest physiology, and preparatory systems. Principles and applications of thermal processing, freezing, and specialized techniques.

- 431 Food Processing: Cereals**

Spring. 3(2-3) P:M: FSC 211 R: Not open to freshmen or sophomores. SA: FSC 331

Classification and composition of cereals. Milling processes. Cereal product manufacture.

- 432 Food Processing: Dairy Foods**

Spring. 3(2-3) P:M: FSC 211 or ANS 210 R: Not open to freshmen or sophomores. SA: FSC 332

Principles for production and processing of safe and wholesome dairy foods. Practical experience in safety and quality assurance systems and in the processing of fluid milk, cultured products, cheese, and frozen desserts.

- 433 Food Processing: Muscle Foods**

Fall. 3(2-3) P:M: FSC 211 or ANS 210 R: Not open to freshmen or sophomores. SA: FSC 333

Manufacturing practices and principles of fresh, frozen, and cured meats and fish. Processed products from muscle foods. Egg characteristics. Product formulation and quality control.

- 440 Food Microbiology**

Spring. 3(3-0) Interdepartmental with Microbiology and Molecular Genetics. Administered by Food Science. P:M: (MMG 201 or MMG 301) and completion of Tier I writing requirement. R: Not open to freshmen. SA: MPH 440

Major groups of microorganisms of importance to the food industry. Ecological, physiological, and public health aspects.

- 441 Food Microbiology Laboratory**

Spring. 2(0-4) Interdepartmental with Microbiology and Molecular Genetics. Administered by Food Science. P:M: (FSC 440 or concurrently) and completion of Tier I writing requirement. RB: MMG 206 or MMG 302 SA: MPH 441

Methods for studying major groups of microorganisms important to the food industry. Isolation, enumeration, characterization, identification, and use of microorganisms.

- 455 Food Analysis**

Fall. 3(2-3) P:M: (BMB 200 or (BMB 401 or concurrently)) and completion of Tier I writing requirement

Principles and application of analytical techniques. Analysis for fats, proteins, carbohydrates, minerals, vitamins, and additives. Techniques include spectroscopy, fluorimetry, chromatography, electrophoresis, and proximate composition.

- 470 Integrated Approaches to Food Product Development**

Fall. 3(2-3) P:M: (FSC 402 or concurrently) or (FSC 441 or concurrently) or (FSC 455 or concurrently) RB: FSC 325 and BE 329 R: Open only to seniors or graduate students.

Food product development including obtaining, screening, and selecting ideas. Integration of food processing, chemistry, analysis, and microbiology for the design, production, and evaluation of a food product.

- 477 Food Engineering: Fluids**

Fall. 3(2-2) Interdepartmental with Biosystems Engineering. Administered by Biosystems Engineering. P:M: BE 350 and BE 351 SA: FE 465

Unit operations, process engineering, equipment, and industrial practices of the food industry. Manufactured dairy products: thermal processing, pipeline design, heat exchange, evaporation, dehydration, aseptic processing, membrane separation, cleaning, and sanitation.

- 490 Special Problems in Food Science**

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Not open to freshmen or sophomores. Approval of department; application required.

Individual study of selected topics in food science. Supervised independent study.

- 493 Professional Internship in Food Science**

Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course. A student may earn a maximum of 6 credits in all enrollments for any or all of these courses: ABM 493, AEE 493, ANR 493, ANS 493, CSS 493, EEP 493, FSC 493, FIM 493, FW 493, HRT 493, PKG 493, PLP 493, PRR 493, and RD 493. R: Open only to juniors or seniors in Food Science. Approval of department; application required.

Supervised professional experiences in agencies and businesses related to food science.

Food Science—FSC

807 Advanced Food Toxicology

Fall of even years. 3(3-0) R: Approval of department.

Toxicology related to food safety. Metabolism of toxicants as influenced by food constituents, mutagenesis, and chemical carcinogenesis. Risk assessment.

823 Diet and Immune Function

Spring of odd years. 3(3-0) RB: Biochemistry and Microbiology.

Influence of diet on the immune system and relationship to infectious and non-infectious diseases, adverse reactions such as food allergy, and alcohol and substance abuse. Methods to evaluate immune function.

831 Advanced Cereal Science

Fall of even years. 3(3-0) RB: (BMB 401 and FSC 331 and FSC 401) or approval of department.

Physico-chemical properties of major constituents in cereal grains. Relationship of constituent structures to functionality in the processing of cereal grains into food products, with emphasis on wheat.

840 Advanced Food Microbiology

Spring of even years. 4(4-0) Interdepartmental with Microbiology and Molecular Genetics. Administered by Food Science. RB: MMG 201 or MMG 301 Not open to students with credit in FSC 440.

In-depth discussion of major groups of microorganisms relevant to the food industry. Ecological, physiological and public health aspects.

842 Foodborne Diseases

Spring of odd years. 3(3-0) RB: FSC 440 or FSC 840

Epidemiology, isolation, characterization, clinical manifestations, pathogenicity, incidence and control of bacterial, parasitic and viral foodborne pathogens and associated toxins.

890 Special Problems in Food Science

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to graduate students in Food Science. Approval of department; application required.

Individual investigation of an area of food science.

891 Selected Topics in Food Science

Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate students in the Food Science major or Human Nutrition major.

Topics of current interest and importance in basic and applied areas of food science.

892 Food Science Seminar

Fall, Spring. 1(1-0) A student may earn a maximum of 4 credits in all enrollments for this course. R: Open only to graduate students in the Food Science major.

Critical review of literature. Organization and communication of scientific data in food science.

898 Master's Research

Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 5 credits in all enrollments for this course. R: Open only to master's students in Food Science. Approval of department.

Directed research in support of Plan B master's degree requirements.

899 Master's Thesis Research

Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to master's students in the Food Science major.

Master's thesis research.

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. R: Open only to doctoral students in the Food Science major.

Doctoral dissertation research.