

Food Science (FDSC)

Courses

FDSC 50001. Seminar. 1 Hour.

Presentation and discussion of graduate student research. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 2 hours of degree credit.

FDSC 5090V. Special Problems Research. 1-6 Hour.

Original investigation on assigned problems in food science. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

FDSC 51101. Food Analysis Lab. 1 Hour.

Laboratory exercises providing students with experience of analytical techniques and instrumentation used in food analysis. Laboratory 3 hours per week. Graduate degree credit will not be given for both FDSC 41101 and FDSC 51101. Corequisite: FDSC 41103 or FDSC 51103. Prerequisite: FDSC 43004 or FDSC 53004 and CHEM 14203 and CHEM 14201 and CHEM 26103 and CHEM 26101 or (CHEM 36053 and CHEM 36051). (Typically offered: Spring)

FDSC 51103. Food Analysis. 3 Hours.

Methods of analysis, instrumentation, and laboratory techniques for measuring the chemical composition of raw and value-added products. Lecture 3 hours. Graduate degree credit will not be given for both FDSC 41103 and FDSC 51103. Corequisite: FDSC 41101 or FDSC 51101. Prerequisite: FDSC 43004 or FDSC 53004 and CHEM 14203 and CHEM 14201 and CHEM 26103 and CHEM 26101 or (CHEM 36053 and CHEM 36051). (Typically offered: Spring)

FDSC 51201. Food Microbiology Lab. 1 Hour.

A hands-on laboratory course designed to teach students microbiological techniques and certain enumeration and plating techniques of specific food spoilage and pathogenic bacteria. Graduate degree credit will not be given for both FDSC 41201 and FDSC 51201. Prerequisite: BIOL 20003 and BIOL 20001. Pre- or Corequisite: FDSC 41202 or FDSC 51202. (Typically offered: Fall)

FDSC 51202. Food Microbiology. 2 Hours.

The study of food microbiology including classification/ taxonomy, contamination, preservation and spoilage of different kinds of foods, pathogenic microorganisms, food poisoning, sanitation, control and inspection and beneficial uses of microorganisms. Graduate degree credit will not be given for both FDSC 41202 and FDSC 51202. Prerequisite: BIOL 20003 and BIOL 20001 or BIOL 25473. (Typically offered: Fall)

This course is cross-listed with BIOL 51262.

FDSC 52203. Food Biosecurity. 3 Hours.

This course is the study of the security of agricultural products and the protection of our food supply from intentional and accidental, domestic and international contamination. Prerequisite: Graduate standing. (Typically offered: Spring Even Years)

FDSC 53004. Food Chemistry. 4 Hours.

Water, carbohydrates, lipids, proteins, vitamins, and minerals in foods; biochemical and functional properties, enzymes, food additives (emulsifiers, pigments, colors, flavors, preservatives, and sweeteners) and texture as related to properties in food systems and during processing. Lecture 3 hours, laboratory 3 hours per week. Graduate degree credit will not be given for both FDSC 43004 and FDSC 53004. Corequisite: Lab component. Prerequisite: CHEM 14203 and CHEM 14201 and CHEM 26103 and CHEM 26101 or (CHEM 36053 and CHEM 36051). (Typically offered: Fall)

FDSC 5310V. Food Science Internship. 1-3 Hour.

The Food Science Internship is a supervised practical work experience with a food industry, research program or governmental agency to gain professional experience and insight into career opportunities. Prerequisite: Completion of first year of graduate studies and instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 3 hours of degree credit.

FDSC 54103. Sensory Evaluation of Food. 3 Hours.

Principles and procedures for sensory evaluation of food. Appropriate uses of specific tests are discussed, along with physiological, psychological, and environmental factors affecting sensory verdicts. Lecture 2 hours, laboratory 2 hours per week. Graduate degree credit will not be given for both FDSC 44103 and FDSC 54103. Corequisite: Lab component. Prerequisite: MATH 21003 or BUSI 10303 or AGST 50203 or STAT 28233 or PSYC 20103. (Typically offered: Fall)

FDSC 54203. Foodborne Diseases. 3 Hours.

This course will introduce students to the major pathogens associated with foodborne diseases, their epidemiology, and approaches to outbreak investigation and control of foodborne illness. An emphasis will be placed on understanding the relationships between the host, the etiologic agent, and the environment as they relate to disease causation. The student will gain knowledge through lectures, case studies, readings, and an individual project. An understanding of basic biology principles is expected for this course. (Typically offered: Summer Odd Years)

FDSC 55003. Safety and Sanitation for the Food Industry. 3 Hours.

This web-based course will provide an appreciation of the need for sanitation in food processing and increase the students' knowledge of sanitary techniques. Topics will include contamination sources, plant and equipment design, cleaners and sanitizers, HACCP, and food biosecurity. Also covered will be considerations in selecting, establishing and maintaining a sanitation program. An understanding of general microbiology and chemistry principles is expected for this course. (Typically offered: Summer Even Years)

FDSC 55103. Cereal Processing Technology. 3 Hours.

Fundamental concepts of heat and mass transport in grains; cereal/grain structure, property and composition; cereal/grain processing systems and technology; cereal/grain co-product processing technology and value recovery; cereal/grain quality metrics, grading standards and food safety assurance. Prerequisite: FDSC 31003 or FDSC 47504 or instructor permission. (Typically offered: Spring Odd Years)

FDSC 55203. Brewing Science. 3 Hours.

The class is designed to give a thorough review of the biological and chemical processes involved in brewing beer and an appreciation for beer styles and flavors. Students will be introduced to industry professionals as well as employment opportunities that support the brewing industry from raw materials to packaged beer. Although not required this course will be designed as a preparation course for students who may want to take an internationally recognized brewing exam/certificate. Prerequisite: (CHEM 14203 or CHEM 12103) and (BIOL 10103 or BIOL 10104). (Typically offered: Fall)

FDSC 57103. Product Innovation for the Food Scientist. 3 Hours.

This is a capstone course integrating knowledge developed in Food Science to the development of new food products. This course will take an integrated multidisciplinary approach to developing innovative food products and will provide learning experiences in new product development and Research & Development. Topics include product formulation, ingredient interactions, sensory analysis, packaging, labeling, food safety and food law. Graduate degree credit will not be given for both FDSC 47103 and FDSC 57103. Corequisite: Lab component. Pre- or Corequisite: FDSC 41103 or FDSC 51103 and FDSC 41101 or FDSC 51101. Prerequisite: FDSC 43004 or FDSC 53004, FDSC 31003, and FDSC 44103 or FDSC 54103. (Typically offered: Spring)

FDSC 57503. Engineering Principles of Food Processing. 3 Hours.

Fundamentals of processing engineering (units, mass, energy balance, steam properties); fluid dynamics (fluid flow, rheology, energy equation, intro to pumps); heat transfer (modes of heat transfer, steady/unsteady state, heat exchangers); mass transfer (concepts and diffusion coefficient), Food Processing applications (Dehydration, Evaporation, Refrigeration, Freezing, Mixing, Physical separations) and Sustainability Topics in Food Engineering (water treatment and reuse strategies, clean energy strategies, waste management in food processing). Corequisite: Lab component. Prerequisite: MATH 12003, PHYS 20103, and PHYS 20101. (Typically offered: Spring Even Years)

FDSC 58203. Principles of Food Microbiology. 3 Hours.

This web-based course is a study of the fundamentals of food microbiology to include its history, classifications, spores and their importance, and the most common and serious pathogenic food microorganisms. Fermentation, spoilage microorganisms and control methodology are also discussed. (Typically offered: Fall Even Years)

FDSC 59903. Global Horticulture and Human Nutrition to Enhance Community Resilience and Food Security. 3 Hours.

This course covers three broad areas (Global Horticulture, Sustainable International Development, Human Health and Nutrition) and experts on three campuses created the instruction. The course is intended to be multi-disciplinary, and students should use their contextual knowledge to add to weekly discussions. Prerequisite: Graduate standing. (Typically offered: Spring Even Years)

This course is cross-listed with AGED 59903, HORT 59903.

FDSC 6000V. Master's Thesis. 1-6 Hour.

Master's Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

FDSC 6020V. Special Topics. 1-3 Hour.

Discussions focused on selected topics of particular fields of raw product physiology and food processing. chemistry, physiology, microbiology, evaluation, sensory analysis and preservation. Prerequisite: Graduate standing. (Typically offered: Irregular) May be repeated for degree credit.

FDSC 60303. Food Biochemistry. 3 Hours.

Biochemical characteristics, functions, regulation and impact of components in raw and processed foods of plant origin. Lecture/discussion 3 hours per week. Prerequisite: CHEM 38103. (Typically offered: Fall Odd Years)

FDSC 61403. Advanced Food Processing and Packaging and their Environmental Impact. 3 Hours.

The course is directed to graduate students in food science and related fields. Students will learn advanced food processing technologies and packaging as well as the environmental issues associated to food production, processing, and distribution. An understanding of basic food processing/food engineering principles and knowledge of food processing operations is expected for this course. (Typically offered: Spring)

FDSC 63203. Nutraceuticals and Functional Foods. 3 Hours.

Course will include past, present and future of nutraceuticals and functional foods, chemistry, mechanism, novel technologies, nutrigenomics, processing, healthy lifestyle, regulation, safety, marketing, international aspects, and industry project. Prerequisite: CHEM 26103 (or CHEM 36053) and CHEM 38103 and FDSC 43004 or instructor consent. (Typically offered: Spring Even Years)

FDSC 63403. Vitamin Nutrition and Metabolism. 3 Hours.

The vitamins required for humans and domestic animals for a healthy life with emphasis on absorption, transport, metabolism, biopotency, mechanism of action, tissue retention and turnover. Prerequisite: CHEM 38103. (Typically offered: Fall Odd Years)

This course is cross-listed with ANSC 63403, POSC 63403.

FDSC 64003. Epidemiologic Principles in Food Safety and Public Health. 3 Hours.

This course will provide an introduction to epidemiologic methods used in foodborne disease outbreak investigations. The importance of surveillance systems in detecting outbreaks and in the development of effective disease prevention and control strategies will also be presented. An emphasis will be placed on understanding the relationships between the host, the etiologic agent, and the environment as they relate to disease causation. In addition, molecular methods utilized for the identification of etiologic agents will be discussed. Selected important foodborne diseases will be discussed in detail to clarify the role of epidemiology in understanding the pathogenesis of infectious processes in individuals and communities. Prerequisite: FDSC 41202 or FDSC 51202 or equivalent. (Typically offered: Fall Even Years)

FDSC 64403. Metabolism of Xenobiotics. 3 Hours.

This course is designed to provide in-depth knowledge of the integration of molecular, cellular, and physiologic aspects of xenobiotics (e.g. phytochemicals)/ micronutrients and metabolism. This course will also discuss the current understanding of the mechanism and regulation of gene expression by xenobiotics/ micronutrients. Examination of current research literature to understand how xenobiotics/micronutrients and physiological states metabolize and influence gene expression, as well as the research methodology used to address these relations. Prerequisite: CHEM 38103. (Typically offered: Fall Even Years)

FDSC 66003. Chemosensory Perception and Measurement. 3 Hours.

This course is designed to address advanced techniques and current issues in sensory and consumer sciences, with a focus on chemosensory perception.

This course consists of two main modules: I) anatomy and physiology of the chemosensory senses and II) measurement/analysis of chemosensory responses.

This course includes both individual and group projects with an emphasis of four aspects of "C": "Concept," "Creativity," "Critical thinking skills," and "Communication." Prerequisite: FDSC 44103 or FDSC 54103. (Typically offered: Fall Odd Years)

FDSC 7000V. Doctoral Dissertation. 1-18 Hour.

The doctoral program in food science is an interdepartmental program offered by the departments of Food Science, Animal and Poultry Sciences, and Human Environmental Sciences. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.