# FOOD SCIENCE AND TECHNOLOGY (FDST)

**FDST 90 Success in Food Science and Technology**
**Description:** An orientation for majors within the Department of Food Science & Technology. Introduction to advising and university services, undergraduate research, study abroad, career paths and community building with faculty and fellow students.
**Credit Hours**: 0
**Max credits per semester:**
**Max credits per degree:**
**Grading Option:** Pass No Pass
**Offered:** FALL

**FDST 101 Introductory Food Science**
**Description:** Food composition, safety, processing, packaging, labeling, product development, food marketing and related topics.
**Credit Hours**: 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Grading Option:** Graded with Option
**Prerequisite for:** FDST 205

**FDST 131 The Science of Food**
**Crosslisted with:** CHEM 131, NUTR 131
**Description:** Covers general and food chemistry, nutrition, food microbiology, food safety and quality, standards that are enforced by regulatory agencies, and food processes applied to improve food quality, shelf life and safety.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Prerequisite for:** FDST 205
**ACE:** ACE 4 Science
**Course and Laboratory Fee:** $5

**FDST 131H The Science of Food**
**Crosslisted with:** CHEM 131H, NUTR 131H
**Prerequisites:** Credit toward the degree cannot be earned in both FDST/CHEM/NUTR 131 and FDST/CHEM/NUTR 131H.
**Description:** Covers general and food chemistry, nutrition, food microbiology, food safety and quality, standards that are enforced by regulatory agencies, and food processes applied to improve food quality, shelf life and safety.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**ACE:** ACE 4 Science
**Course and Laboratory Fee:** $5

**FDST 132 Practical Applications in Food Science**
**Prerequisites:** Food science and technology major.
**Description:** Food processing, preservation, nutrition, safety, quality, marketing, and related topics. Food processing procedures and equipment. Microbiological and chemical procedures.
**Credit Hours**: 1
**Max credits per semester:** 1
**Max credits per degree:** 1
**Grading Option:** Graded with Option

**FDST 205 Food Composition and Analysis**
**Prerequisites:** CHEM 109A and 109L and CHEM 110A and 110L; FDST 101 or 131.
**Description:** Major components of foods, their structures, and their role in the functional and nutritional properties of foods. Chemical methods for the determination and characterization of major food components.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 280 Contemporary Issues in Food Science**
**Description:** Current issues in food science, including the impact of COVID-19 in food science, food psychology and culture, the edible cannabis industry, organic foods, obesity, world hunger, food allergens, plant-based meat and milk, food safety, GMOs, probiotics and gut health, and sustainability.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded
**Offered:** FALL
**Experiential Learning:** Case/Project-Based Learning

**FDST 301 Chemistry of Food**
**Notes:** A chemistry course for non-majors taught via distance education. Will not count toward a FDST major. A previous course in chemistry or Food Science may be helpful but is not required.
**Description:** Emphasizes essential principles of chemistry and their application to food systems. Covers the molecular properties of food components (proteins, carbohydrates, and lipids) and their chemical reactions. Provides understanding of how chemistry impacts food quality and contributes to wellness.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Offered:** SPRING
**ACE:** ACE 4 Science

**FDST 363 Heat and Mass Transfer**
**Crosslisted with:** AGST 363
**Prerequisites:** MATH 104 or 106; AGST 109 or PHYS 141 or 151.
**Description:** Fundamentals of food engineering including material and energy balances, fluid mechanics, heat transfer and mass transfer.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 367 Pet Food Manufacturing**
**Crosslisted with:** AGST 367
**Prerequisites:** CHEM 106A and 106L or CHEM 110A and 110L
**Notes:** Field trips are required and may occur outside of scheduled class time.
**Description:** The companion animal industry, products, processes and career opportunities.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded
**Offered:** FALL

**FDST 369 Food Preservation Principles and Packaging**
**Prerequisites:** CHEM 105A/L or CHEM 109A/L or CHEM 113A/L; STAT 218
**Description:** Examination of additions, removals, treatments, packaging and preventions taken in order to maintain safety, quality and healthiness of food materials during distribution and storage for the benefit of the global population and its food system.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded
**Offered:** SPRING

**FDST 391 International Study Tour**
**Prerequisites:** Permission
**Notes:** Sophomore standing or higher recommended
**Description:** Individual or group educational experience combining classroom lectures, discussions, and/or seminars with tours to broaden the student's knowledge of specific aspects of food science and technology in a foreign country. Choice of subject matter and coordination of on- and off-campus study is at the discretion of the instructor.
**Credit Hours**: 0-3
**Min credits per semester:**
**Max credits per semester:** 3
**Max credits per degree:** 6
**Grading Option:** Graded with Option

**FDST 392 Food Industry Study Tour**
**Prerequisites:** Permission
**Description:** Study tour of food industry processors and government agencies. Provide an understanding of the industry's operations and problems.
**Credit Hours**: 1
**Max credits per semester:** 1
**Max credits per degree:** 3
**Grading Option:** Pass No Pass

**FDST 396 Independent Study in Food Science and Technology**
**Prerequisites:** Permission.
**Description:** Individual or group projects in research, literature review, or extension of course work under supervision and evaluation of a departmental faculty member.
**Credit Hours**: 1-5
**Min credits per semester:** 1
**Max credits per semester:** 5
**Max credits per degree:** 12
**Grading Option:** Graded with Option

**FDST 401 Teaching Applications of Food Science**
**Crosslisted with:** FDST 801
**Prerequisites:** BIOS 101 and CHEM 109A and 109L
**Notes:** Will not count toward a FDST major or minor.
**Description:** Overview of the science of food and how food can be used in the classroom to enhance science education.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 403 Food Quality Assurance**
**Crosslisted with:** FDST 803
**Prerequisites:** FDST 205; STAT 218.
**Description:** Quality related issues as they pertain to manufacturing, processing, and/or testing of foods, with a major emphasis on food regulations, statistical process control and Hazard Analysis of Critical Control Points (HACCP).
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 405 Food Microbiology**
**Crosslisted with:** BIOS 445, BIOS 845, FDST 805
**Prerequisites:** BIOS 312
**Notes:** BIOC 401 or BIOC 431 recommended
**Description:** Nature, physiology, and interactions of microorganisms in foods. Introduction to food-borne diseases, the effect of food processing systems on the microflora of foods, principles of food preservation, food spoilage, and foods produced by microorganisms. Food plant sanitation and criteria for establishing microbial standards for food products.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Offered:** FALL/SPR
**Prerequisite for:** BIOS 446, BIOS 846, FDST 406, FDST 806; FDST 424, FDST 824; FDST 425, FDST 825; FDST 460, FDST 860; FDST 867; FDST 875; FDST 877; FDST 908B

**FDST 406 Food Microbiology Laboratory**
**Crosslisted with:** BIOS 446, BIOS 846, FDST 806
**Prerequisites:** Parallel in FDST 405/805/BIOS 445/845.
**Description:** The microorganisms in foods and the methods used to study them.
**Credit Hours**: 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Grading Option:** Graded with Option
**Course and Laboratory Fee:** $40

**FDST 412 Cereal Technology**
**Crosslisted with:** FDST 812
**Prerequisites:** FDST 205.
**Description:** Chemistry and technology of the cereal grains. Post-harvest processing and utilization for food and feed. Current industrial processes and practices, and the theoretical basis for these operations.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 413 Baking Technology**
**Crosslisted with:** FDST 813
**Prerequisites:** FDST 205
**Description:** Chemistry and technology of bakery products, including formulation, ingredient functionality, processing, and quality evaluation.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded
**Offered:** FALL

**FDST 415 Food Mycology**
**Crosslisted with:** FDST 815
**Prerequisites:** Junior or Senior standing, 3 hours BIOS or LIFE
**Description:** The role of fungi in human food, including edible and poisonous mushrooms, fungi used in food processing (especially yeasts), and the occurrence, growth, and mycotoxin production of molds in human foods, animal feeds, and the human environment. Methods and techniques for culturing, enumerating and identifying molds, yeasts, and mushrooms. Analytical methods for mycotoxins, and effects of food and feed processing on mycotoxin stability.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Offered:** FALL
**Course and Laboratory Fee:** $50

**FDST 419 Meat Investigations**
**Crosslisted with:** ASCI 419, ASCI 819, FDST 819
**Prerequisites:** ASCI 210
**Description:** Conduct independent research and study meat industry problems in processing, production, storage, and preparation of meat and meat products.
**Credit Hours**: 1-3
**Min credits per semester:** 1
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 420 Fruit and Vegetable Technology**
**Crosslisted with:** FDST 820
**Prerequisites:** FDST 205.
**Description:** Harvesting and postharvest handling of fruit and vegetables, processing and safety issues, processes of ripening and/or maturation in fresh fruits and vegetables.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Course and Laboratory Fee:** $25

**FDST 424 Food Safety Microbiology**
**Crosslisted with:** FDST 824
**Prerequisites:** FDST 405
**Description:** Microbiological sampling, testing, and foodborne pathogen detection tools to support current food safety and sanitation regulatory requirements and the design and implementation of food safety management systems.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Offered:** SPRING

**FDST 425 Food Toxicology**
**Crosslisted with:** FDST 825
**Prerequisites:** FDST 405/805, BIOC 401, or equivalent.
**Description:** Toxic substances that may be found in foods with emphasis on bacterial toxins, mycotoxins, and naturally occurring toxicants of plants, animals, and seafood. Basic toxicological methodology and the effects of food processing and handling on food-borne toxicants.
**Credit Hours**: 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Grading Option:** Graded with Option

**FDST 426 Food Safety Auditor**
**Crosslisted with:** FDST 826
**Prerequisites:** Major in Food Science & Technology and Senior Standing
**Notes:** Includes team activities such as a mock inspection of our food processing pilot plant and creating a food safety plan using a model food. Receive certification as a Preventive Controls Qualified Individual, recognized by the FDA as qualifying them to create a food safety plan.
**Description:** Preparation for a career that will include inspections and audits as a standard part of ensuring a safe food production chain.
**Credit Hours**: 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Grading Option:** Graded
**Offered:** SPRING

**FDST 429 Dairy Products Technology**
**Crosslisted with:** FDST 829
**Prerequisites:** FDST 205.
**Notes:** Offered spring semester of odd-numbered calendar years.
**Description:** Physical, chemical, and microbiological properties of milk. Principles of milk processing and manufacture of cultured dairy products, cheeses, ice cream, and concentrated dairy products.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 430 Sensory Evaluation**
**Crosslisted with:** FDST 830, STAT 430, STAT 830
**Prerequisites:** Introductory course in statistics.
**Description:** Food evaluation using sensory techniques and statistical analysis.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Course and Laboratory Fee:** $10

**FDST 442 My Gut, My Health, My Food**
**Crosslisted with:** FDST 842
**Prerequisites:** Junior or Senior standing
**Description:** Detailed examples and conceptual overview of studies that define the digestive tract microbial ecosystem both at the local and systemic scale in the context of omnivores such as humans and animals are presented. The concepts in focus are associated with high-dimensional datasets (or big data) used for studying these complex biosystems, and the multi-dimensional interactions between the microbiomes in its ecosystem. Topics include the host-cycle of life in health and disease in relation to the bacteria of the digestive tract, as well as the modification of their ecology due to health issues, nutrition, and microbial competition or chemical modification.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded
**Offered:** SPRING

**FDST 448 Food Chemistry**
**Crosslisted with:** FDST 848
**Prerequisites:** FDST 205; CHEM 251; BIOC 401.
**Description:** Molecular components of various foods and the reactions of these components during the processing of foods.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Prerequisite for:** ASCI 917; FDST 449, FDST 849; FDST 452, FDST 852; FDST 458, FDST 858; FDST 460, FDST 860

**FDST 449 Food Chemistry Laboratory**
**Crosslisted with:** FDST 849
**Prerequisites:** FDST 205; FDST 448/848 or parallel; BIOC 401.
**Description:** Experiments involving the isolation, purification, and characterization of the molecular components of foods.
**Credit Hours**: 1
**Max credits per semester:** 1
**Max credits per degree:** 1
**Grading Option:** Graded with Option
**Prerequisite for:** FDST 458, FDST 858
**Course and Laboratory Fee:** $20

**FDST 451 Food Science and Technology Seminar**
**Prerequisites:** Permission.
**Description:** Student presentations of food science literature and research.
**Credit Hours**: 1
**Max credits per semester:** 1
**Max credits per degree:** 1
**Grading Option:** Graded with Option

**FDST 452 Physical Chemistry of Foods**
**Crosslisted with:** FDST 852
**Prerequisites:** FDST 448/848 or instructor approval.
**Description:** The basic theory of physical chemistry that is relevant in food science and technology. Understand and predict changes occurring in a food during processing, storage, and handling using physical chemistry theory. Design and improvement of processes to make foods having specific qualities in an efficient way.
**Credit Hours**: 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Grading Option:** Graded

**FDST 455 Microbiology of Fermented Foods**
**Crosslisted with:** FDST 855, MBIO 455
**Prerequisites:** BIOS 312
**Notes:** On-campus students must also register for FDST 455L/855L.
**Description:** Physiology, biochemistry, and genetics of microorganisms important in food fermentation. How microorganisms are used in fermentation and the effects of processing and manufacturing conditions on production of fermented foods.
**Credit Hours**: 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Grading Option:** Graded with Option
**Offered:** SPRING

**FDST 455L Microbiology of Fermented Foods Laboratory**
**Crosslisted with:** FDST 855L, MBIO 455L
**Prerequisites:** Parallel FDST 455/855/MBIO 455
**Description:** Experiments involving the microorganisms and fermentation of foods and beverages.
**Credit Hours**: 1
**Max credits per semester:** 1
**Max credits per degree:** 1
**Grading Option:** Graded with Option
**Offered:** SPRING
**Course and Laboratory Fee:** $50

**FDST 458 Advanced Food Analysis**
**Crosslisted with:** FDST 858
**Prerequisites:** FDST 205, 448/848, and FDST 449/849.
**Description:** Theory and application of molecular and atomic spectroscopy, immunochemistry and thermal methods to the analysis of foods. Chemical separation techniques for the isolation of food constituents.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**Course and Laboratory Fee:** $20

**FDST 460 Food Product Development Concepts I**
**Crosslisted with:** FDST 860
**Prerequisites:** FDST 405/805 and FDST 448/848.
**Notes:** Capstone course.
**Description:** Develop a commercially viable food product using chemical, microbiological and sensory analysis principles, and marketing and packaging sciences.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option
**ACE:** ACE 10 Integrated Product
**Course and Laboratory Fee:** $40
**Experiential Learning:** Case/Project-Based Learning

**FDST 465 Food Engineering Unit Operations**
**Crosslisted with:** FDST 865, AGST 465, AGST 865
**Prerequisites:** FDST/AGST 363.
**Description:** Unit operations and their applications to food processing.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 470 Nutraceuticals and Functional Foods**
**Crosslisted with:** FDST 870
**Prerequisites:** BIOC 401 or BIOC/BIOS/CHEM 431/831.
**Description:** Evaluation of natural compounds impact on human health. Inflammation, cancer, heart disease, and the impact of gut micro-flora on health.
**Credit Hours**: 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Graded with Option

**FDST 492 Special Topics in Food Science and Technology**
**Crosslisted with:** FDST 892
**Prerequisites:** FDST 205 or BIOS 312 or CHEM 251 or CHEM 253 or junior standing or higher
**Description:** Special topics that address current and emerging issues in food science and technology.
**Credit Hours**: 1-6
**Min credits per semester:** 1
**Max credits per semester:** 6
**Max credits per degree:** 24
**Grading Option:** Graded with Option

**FDST 495 Internship Experience**
**Prerequisites:** Permission
**Notes:** Sophomore standing or higher and permission
**Description:** Professional experience in a food science and technology area. Experience may be with a business, government agency, organization, or a university research, extension, or teaching program.
**Credit Hours**: 0-3
**Min credits per semester:**
**Max credits per semester:** 3
**Max credits per degree:** 3
**Grading Option:** Pass No Pass

**FDST 498 Undergraduate Research Experience**
**Prerequisites:** Permission
**Notes:** Sophomore standing or higher
**Description:** Conduct a scholarly research project investigating a specific problem.
**Credit Hours**: 1-3
**Min credits per semester:** 1
**Max credits per semester:** 3
**Max credits per degree:** 6
**Grading Option:** Graded with Option

**FDST 499H Honors Thesis**
**Prerequisites:** Permission
**Notes:** AGRI 299H recommended.
**Description:** Conduct a scholarly research project and write a University Honors Program or undergraduate thesis.
**Credit Hours**: 1-3
**Min credits per semester:** 1
**Max credits per semester:** 3
**Max credits per degree:** 6
**Grading Option:** Graded with Option