

# FSTC - FOOD SCIENCE & TECH (FSTC)

## FSTC 201 Food Science

**Credits 3. 3 Lecture Hours.** (AGRI 1329) Food Science. The fundamental biological, chemical and physical scientific principles associated with the study of foods; topics include food composition and nutrition, food additives and regulations, food safety and toxicology, food processing, food engineering, food biotechnology, product development and sensory evaluation.

## FSTC 210/NUTR 210 Horizons in Nutrition and Food Science

**Credit 1. 1 Lecture Hour.** Introduction to nutrition and food science career opportunities through presentations by nutrition and food science researchers and industry professionals; addresses issues of professionalism including portfolio development, teamwork, and critical thinking skills. **Cross Listing:** NUTR 210/FSTC 210.

## FSTC 281 Introduction to Fermentation and Brewing Sciences

**Credits 3. 3 Lecture Hours.** Master fermentation and brewing science, from microbial selection to bio-separation, ensuring food safety and quality compliance.

## FSTC 285 Directed Studies

**Credits 0 to 4. 0 to 4 Other Hours.** Directed study of selected problems in the area of food science. **Prerequisites:** Approval of instructor; 2.0 GPR in major and overall.

## FSTC 289 Special Topics in...

**Credits 1 to 4. 1 to 4 Lecture Hours.** Selected topics in an identified area of food science and technology. May be repeated for credit. **Prerequisite:** Approval of instructor.

## FSTC 291 Research

**Credits 0 to 4. 0 to 4 Other Hours.** Research conducted under the direction of faculty member in food science and technology. May be repeated 2 times for credit. **Prerequisites:** Freshman or sophomore classification and approval of department head.

## FSTC 300/NUTR 300 Religious and Ethnic Foods

**Credits 3. 3 Lecture Hours.** Understanding religious and ethnic foods with application to product development, production, and nutritional practices; emphasis on different food rules and priorities with attention given to different religious and ethnic groups within the US and around the world. **Prerequisites:** Junior or senior classification or approval of instructor; basic knowledge of food science and nutrition helpful. **Cross Listing:** NUTR 300/FSTC 300.

## FSTC 305 Fundamental Baking

**Credits 3. 2 Lecture Hours. 3 Lab Hours.** Fundamentals of baking; chemical and physical properties of ingredients, methods of baking all products, fundamental reactions of dough, fermentation and oven baking. **Prerequisite:** CHEM 222 or CHEM 227 or approval of department head.

## FSTC 311 Principles of Food Processing

**Credits 3. 2 Lecture Hours. 3 Lab Hours.** Principles and practices of canning, freezing, dehydration, pickling and specialty food manufacture; fundamental concepts of various techniques of preparation, processing, packaging and use of additives; processing plants visited. **Prerequisite:** FSTC 201; junior or senior classification or approval of department head or instructor.

## FSTC 312 Food Chemistry

**Credits 3. 3 Lecture Hours.** The fundamental and relevant chemistry and functionality of the major food constituents (water, carbohydrates, lipids, proteins, phytochemical nutraceuticals) and study of food emulsion systems, acids, enzymes, gels, colors, flavors and toxins. **Prerequisite:** FSTC 201; CHEM 227; CHEM 237 or approval of department head or instructor.

## FSTC 313 Food Chemistry Laboratory

**Credit 1. 3 Lab Hours.** Laboratory exercises investigating specific molecules, such as food acids, enzymes, pigments and flavors, and chemical interactions in foods, such as oxidation reactions, emulsion systems, and functional properties from a fundamental chemistry rather than an analytical perspective. **Prerequisite:** FSTC 201; CHEM 227; CHEM 237 or approval of department head or instructor.

## FSTC 314 Food Analysis

**Credits 3. 1 Lecture Hour. 4 Lab Hours.** Selected standard methods for assay of food components; principles and methodology of both classical and instrumental techniques for food analysis. **Prerequisite:** FSTC 201; FSTC 311; CHEM 227; CHEM 237 or approval of department head or instructor.

## FSTC 315/AGSM 315 Food Process Engineering Technology

**Credits 3. 2 Lecture Hours. 2 Lab Hours.** Elementary mechanics, physical and thermal properties of food and processing materials, heat transfer, mass and energy balances, psychrometrics (properties of air), insulation. **Prerequisites:** Grade of C or better in PHYS 201 or PHYS 206, or approval of instructor. **Cross Listing:** AGSM 315/FSTC 315.

## FSTC 316 Food Biomanufacturing and Cellular Agriculture

**Credits 3. 3 Lecture Hours.** Exploration of fermentation science, cellular agriculture, alternative proteins, and lab techniques for bioprocessing, microbial communities, and food safety. **Prerequisites:** Junior or senior classification.

## FSTC 319 Molecular Methods for Microbial Detection and Characterization

**Credits 3. 2 Lecture Hours. 2 Lab Hours.** Exploration of vital molecular methods crucial for identifying and characterizing microbial communities across industries such as fermentation and brewing. **Prerequisites:** BIOL 111, BIOL 112 or BIOL 206; junior or senior classification.

## FSTC 320/NUTR 320 Understanding Obesity - A Social and Scientific Challenge

**Credits 3. 3 Lecture Hours.** Perspectives of obesity in food science, nutrition, health and psychology; study of obesity factors in relation to genetics, exercise physiology and sociology with emphasis on food and nutrition. **Prerequisites:** Junior or senior classification or approval of instructor. **Cross Listing:** NUTR 320/FSTC 320.

## FSTC 324 Food Safety and Preventive Controls for Human Food

**Credits 3. 3 Lecture Hours.** Microbiological food spoilage, fermentation and safety; U.S. Food and Drug Administration (FDA) recognized curriculum for "preventive controls qualified individual" within the FDA Hazard Analysis and Risk-based Preventive Controls for Human Food regulation. **Prerequisites:** Junior or senior classification or approval of instructor.

## FSTC 326/ANSC 326 Food Bacteriology

**Credits 3. 3 Lecture Hours.** Microbiology of human foods and accessory substances; raw and processed foods; physical, chemical and biological phases of spoilage; standard industry techniques of inspection and control. **Prerequisite:** Junior or senior classification or approval of instructor. **Cross Listing:** ANSC 326/FSTC 326.

## FSTC 327/ANSC 327 Food Bacteriology Lab

**Credit 1. 3 Lab Hours.** Laboratory to accompany ANSC 326/FSTC 326 or FSTC 326/ANSC 326. **Cross Listing:** ANSC 327/FSTC 327.

## FSTC 330 Dairy and Food Technology

**Credits 4. 3 Lecture Hours. 3 Lab Hours.** Principles and practices involved in processing of milk into market milk, butter, cheese and cheese foods; fundamental principles of these processes as related to their design and control.

## FSTC 331 Dairy and Food Technology

**Credits 4. 3 Lecture Hours. 3 Lab Hours.** Manufacture of frozen, freeze-dehydrated, concentrated and dehydrated dairy foods; fundamental aspects of freezing, concentration and dehydration of foods.

**Prerequisite:** FSTC 330 or approval of department head.

## FSTC 401 Food Product Development

**Credits 3. 2 Lecture Hours. 3 Lab Hours.** Design and develop food products using principles of food chemistry, food processing, nutrition, sensory analysis and statistics; team collaborate to improve food product characteristics to meet the needs of a changing society.

**Prerequisites:** FSTC 201, FSTC 311, FSTC 312, FSTC 313, FSTC 314, FSTC 315/AGSM 315, FSTC 326/ANSC 326, or concurrent enrollment; senior classification or approval of instructor.

## FSTC 410/NUTR 410 Nutritional Pharmacometrics of Food Compounds

**Credits 3. 3 Lecture Hours.** Nutritional pharmacokinetics and pharmacodynamics of food compounds; specific examples of toxicological and pharmacological effects of food compounds.

**Prerequisites:** NUTR 201, NUTR 202, NUTR 203, CHEM 222, or CHEM 227, or approval of instructor; junior or senior classification. **Cross Listing:** NUTR 410/FSTC 410.

## FSTC 416 Precision Fermentation and Future of Foods

**Credits 3. 3 Lecture Hours.** Exploration of precision fermentation; bioprocessing to gene editing, and its applications in sustainable food production. **Prerequisites:** Junior or senior classification.

## FSTC 420 Supervised Research in Mediterranean Nutrition and Food Processing in Italy

**Credits 3. 3 Other Hours.** Exploration of principles of Mediterranean diet, European nutrition regulatory aspects, wine-making and food processing in Italy. **Prerequisites:** FSTC 201, NUTR 202, or NUTR 203; must be 18 years of age; class and tours taught in English; priority given to majors in FSTC or NUTR.

## FSTC 422 Food Processing for Sustainable Nutrition in Brazil

**Credits 3. 3 Other Hours.** Sustainable nutrition and food processing in Brazil; hands-on learning at the Federal University of Vicosa, the Amazon Biotechnology Center, food processing plants and other research centers in the Amazon, central Brazil and Rio De Janeiro. **Prerequisites:** FSTC 201, NUTR 202, or NUTR 203; must be 18 years of age; class and tours taught in English; priority given to majors in FSTC or NUTR.

## FSTC 430 Innovative Functional Food Ingredients

**Credits 3. 3 Lecture Hours.** Exploration of the impact of functional food ingredients on human health and the microbiome, processing, quality control, and regulatory compliance under FDA and FTC guidelines.

**Prerequisites:** FSTC 201 and FSTC 311, or FSTC 314, or FSTC 313; or approval of instructor.

## FSTC 444 Fundamentals of Food Law

**Credits 3. 3 Lecture Hours.** History, development of, and fundamental principles behind current food regulations, including food labeling, adulteration, food safety, food additives, dietary supplements, and import and export laws; overview of government agency jurisdiction, international law and ethics. **Prerequisite:** FSTC 201; junior or senior classification.

## FSTC 457/ANSC 457 Hazard Analysis and Critical Control Point System

**Credits 3. 3 Lecture Hours.** Hazard Analysis and Critical Control Point (HACCP) principles specifically related to meat and poultry; microbiological and process overviews; good manufacturing practices and standard operating procedures development. **Prerequisite:**

FSTC 326/ANSC 326 or ANSC 326/FSTC 326, or approval of instructor.

**Cross Listing:** ANSC 457/FSTC 457.

## FSTC 470/ANSC 470 Quality Assurance for the Food Industry

**Credits 3. 3 Lecture Hours.** Principles of food system process control including statistical process control (SPC) and the tools required to assure uniform communication and understanding of quality assurance systems. **Prerequisite:** Junior or senior classification. **Cross Listing:** ANSC 470/FSTC 470.

## FSTC 481 Seminar

**Credit 1. 1 Lecture Hour.** Guidelines and practice in journal article review and making effective technical presentations; strategies for conducting a job search; development of résumés and letters and interviewing targeted for careers in the food industry or graduate school. **Prerequisite:** Senior classification in food science and technology.

## FSTC 484 Internship

**Credits 0 to 6. 0 to 6 Other Hours.** Professional internship or practical food science experience in the food industry, non-profit organization, or other entity by instructor. Must be taken on a satisfactory/unsatisfactory basis. **Prerequisites:** Junior or senior classification.

## FSTC 485 Directed Studies

**Credits 0 to 4. 0 to 4 Other Hours.** Directed study on selected problems in the area of food science not covered in other courses. **Prerequisites:** Junior or senior classification; approval of department head; 2.0 GPR in major and overall.

## FSTC 487/ANSC 487 Sensory Evaluation of Foods

**Credits 3. 2 Lecture Hours. 2 Lab Hours.** Application of sensory science principles and practices to food systems including an understanding of discriminative, descriptive and consumer sensory techniques.

**Prerequisites:** CHEM 222 or CHEM 228; junior or senior classification.

**Cross Listing:** ANSC 487/FSTC 487.

## FSTC 489 Special Topics in...

**Credits 1 to 4. 1 to 4 Other Hours.** Selected topics in an identified area of food science and technology. May be repeated for credit. **Prerequisite:** Junior or senior classification.

## FSTC 491 Research

**Credits 0 to 4. 0 to 4 Other Hours.** Research conducted under the direction of a faculty member in food science. May be repeated 3 times for credit. Registration in multiple sections of this course are possible within a given semester provided that the per semester credit hour limit is not exceeded.