

Program Learning Outcomes

Food Science and Technology

Students who successfully complete the food science major will be prepared for variety of career choices depending upon their chosen option. However, irrespective of option, all students will have the necessary fundamental knowledge, comprehension, and expertise to begin careers in the food industry. Students also will be able to enter graduate or professional schools if their career choice requires advanced educational degrees.

- Students successfully completing the **Food Technology** option will be able to enter into career industry positions in quality assurance, product development, and food processing.
- Students successfully completing the **Food Business and Management** option will be able to enter management positions in smaller food companies as well as marketing and technical sales positions in corporate food industries.
- Students successfully completing the **Brewing Science** option will be able to begin careers in production or quality assurance within the brewing or food fermentation industries.
- Students successfully completing the **Consumer Food Science** option will be able to pursue employment in food product formulation, sensory evaluation, research and development oriented marketing, university extension, and community service.
- Students successfully completing the **Food Chemistry, Food Biochemistry, and Food Biology/Microbiology** options will be able to pursue careers in research and development with food companies, government agencies, universities, or private laboratories. Students in these options are strongly encouraged to undertake undergraduate research projects with faculty members and then to pursue advanced degrees from graduate or professional schools prior to initiating their careers.

Student Learning Outcomes

Food Chemistry

- Describe molecular structures associated with food carbohydrates, lipids, and proteins, and relate structure to their food functionality
- Describe major food chemical reactions (e.g. lipid oxidation, Maillard browning) and their mechanisms
- Determine the properties of foods and evaluate the functional properties of the constituents of food systems such as bread, cakes, dairy products, candy, plant pigments
- Analyze different classes of molecules in foods using the techniques of IR, UV-Vis spectroscopy, GC, HPLC and MS
- Evaluate food ingredient choices, to predict food nutritional, quality and functional properties, analyze food choices

Food Safety and Microbiology

- Identify the characteristics of microorganisms (e.g., spoilage vs. pathogenic vs. food preservation/fermentation, psychrophilic vs. mesophilic vs. thermophilic, aerobic vs. anaerobic vs. facultative)

- Describe the conditions (i.e., a_w , pH, temperature, oxygen level) that different types of microorganisms need to grow in foods and the conditions
- Describe regulatory limits associated with food safety and quality
- Utilize laboratory techniques to isolate and identify microorganisms found in food and food processing facilities

Food Processing

- Describe the processing of commodity foods important to California
- Identify the major chemical reactions that occur during food processing and storage
- Describe the processing of foods in terms of unit operations
- Develop and solve mass, energy and momentum balances
- Evaluate heat transfer under steady and unsteady state conditions

Sensory Science

- Understand the functions of the human senses and brain information processing so as to be able to custom design testing procedures for consumer and sensory testing
- Identify the principles, theory, design, application and assumptions behind statistical analysis for consumer and sensory experimentation and testing
- Relate sensory properties and consumer acceptance to food chemistry, microbiology and processing practices
- Use computers for statistical analysis of sensory and consumer data

Applied Food Science

- Describe the variability in processes and materials and the effect on product quality
- Use computers for statistical analysis of laboratory data
- Use statistical procedures, to determine significance of relationships between processing parameters and quality/safety attributes in food processing
- Design and conduct experiments which will generate data for compositional analysis
- Integrate food chemistry, food microbiology, food processing, and sensory science to develop product prototypes

Success Skills

- Describe the key regulatory agencies and laws governing the U.S. food supply
- Develop relationships within teams to appreciate diversity (i.e., different ways to approach problems)
- Prepare presentations, reports, assignments according to requested format
- Evaluate current topics and the relationship to regulatory issues (e.g., recent food borne illness outbreaks, food adulteration)
- Critique literature in order to effectively conduct research