

# FOOD SCIENCE (FS)

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## **FS 1100 Introduction to Food Science (3 credits)**

Chemistry, microbiology, and processing of food and food products; concepts of food preservation, packaging and marketing of foods; food additives and regulations; world food problems. Field trip may be required. Cooperative: open to WSU degree-seeking students.

## **FS 1130 Introduction to Vines and Wines (3 credits)**

The importance of viticulture (grape growing) and enology (winemaking); wine quality. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

## **FS 2010 (s) Science on Your Plate: Food Safety, Risks and Technology (3 credits)**

General Education: American Experience

Cross-listed with CORS 2320

An interdisciplinary, thematically based course intended to provide the student with the skills to analyze and evaluate scientific claims and to make intelligent scientific and social decisions; among the topics addressed are the impact of science on society and the ethical dilemmas and moral consequences of scientific research; all themes/sections emphasize discussion, collaborative work, and the conduct of science, though not necessarily in a formal lab setting. See [www.uidaho.edu/class/general-education](http://www.uidaho.edu/class/general-education) for specific course titles and descriptions.

## **FS 2040 (s) Special Topics (1-16 credits, max 99)**

Credit arranged. Cooperative: open to WSU degree-seeking students.

## **FS 2990 (s) Directed Study (1-16 credits, max 99)**

Credit arranged Cooperative: open to WSU degree-seeking students.

## **FS 3010 Food Mycology (3 credits)**

Survey of the fungi important in food production, storage, and spoilage. Includes two hours of lecture and three hours of lab per week. Prereqs or Coreqs: BIOL 2500 or BIOL 2550 Cooperative: open to WSU degree-seeking students

## **FS 3020 Food Processing Lab (1 credit)**

Application of specialized techniques, concepts and practices of food processing. Field trip required. Typically Offered: Fall.

Coreqs: FS 3030 Cooperative: open to WSU degree-seeking students

## **FS 3030 Food Processing (3 credits)**

Specialized techniques, concepts, and practices of food processing.

Prereqs: AVS 2720 or FS 1100; and MATH 1160 or MATH 1170; and STAT 2510

Coreqs: FS 3020 Cooperative: open to WSU degree-seeking students

## **FS 3040 Cereal Chemistry and Processing (3 credits)**

This course has been designed to provide students with a breadth of knowledge in the field of cereal grain science. This course will cover cereal and legume structure, chemistry, and function as it relates to processing and utilization.

Prereqs: CHEM 2750 or CHEM 2770 Cooperative: open to WSU degree-seeking students.

## **FS 3500 Instrumental and Sensory Analysis of Food (5 credits)**

Introduction to the theory, principles, and applications of sensory evaluation techniques and instrumental techniques for the evaluation of the chemical and physical properties of foods. Students will learn basic psychological and physiological processes underlying sensory analysis, sensory testing methodologies, and the perception of appearance, aroma, taste, and texture of foods, basic food analysis methods and the relationship between instrumental and sensory methods of analysis. 3 credit lecture, 2 credit laboratory Typically Offered: Spring.

Prereqs: FS 1100 or FS 2010, FS 3020 & FS 3030, CHEM 2770 and CHEM 2780, STAT 2510 Cooperative: open to WSU degree-seeking students.

## **FS 3630 Animal Products for Human Consumption (4 credits)**

Cross-listed with AVS 3630

The meat, dairy, and egg industries, including product produced, processed, safety (HACCP), nutrition, distribution, quality, quantity, palatability, health, cooking, home storage, and consumer concerns. Special clothing and equipment required. Three lecture credits and one 3-hour lab per week. Recommended Preparation: BIOL 1150, BIOL 1150L. Cooperative: open to WSU degree-seeking students.

## **FS 3980 (s) Internship (1-16 credits, max 99)**

Credit arranged. Supervised professional internship in the food industry; requires formal written plan of activities approved by academic advisor and department head. Final written report and presentation required. Cooperative: open to WSU degree-seeking students.

## **FS 4000 (s) Seminar (1-16 credits, max 99)**

Credit arranged

## **FS 4010 Industrial Fermentations (3 credits)**

Science and technology associated with industrial-scale food fermentations.

Prereqs: BIOL 2500 and BIOL 3000 Cooperative: open to WSU degree-seeking students.

## **FS 4030 (s) Workshop (1-16 credits, max 99)**

Credit arranged. Workshops focusing on food science. Cooperative: open to WSU degree-seeking students.

## **FS 4040 (s) Special Topics (1-16 credits, max 99)**

Credit arranged. Special topics related to food science. Cooperative: open to WSU degree-seeking students.

## **FS 4050 (s) Professional Development (1-16 credits, max 99)**

Credit arranged

## **FS 4160 Food Microbiology (3 credits)**

Purpose for enumeration, detection, and identification of microorganisms in food products; physical, chemical, and environmental factors influencing growth and survival of foodborne microorganisms; pathogenic and spoilage microorganisms in food and their control.

Prereqs: BIOL 2500 and BIOL 2550 Cooperative: open to WSU degree-seeking students.

## **FS 4170 Food Microbiology Laboratory (2 credits)**

Methods for enumeration, detection, and identification of spoilage and pathogenic microorganisms in foods. Two 3-hour labs per week. Prereqs or

Coreqs: FS 4160 Cooperative: open to WSU degree-seeking students

## **FS 4180 Oral Seminar in Food Science (1 credit)**

Development of skills and communication tools and techniques for oral presentations of current food science research. Typically Offered: Fall.

Prereqs: FS 1100; and junior standing; and major in food science. Cooperative: open to WSU degree-seeking students.

**FS 4290 Dairy Processing (3 credits)**

Joint-listed with FS 5290

Basic dairy chemistry, microbiology, and processing from cow to consumer; dairy quality, safety, and sanitation; milk components, fluid milk, concentrated milk, cream, butter, ice cream, fermented milk, cheese, and dairy powders. Additional projects/assignments required for graduate credit. Recommended Preparation: FS 1100, FS 1130. Typically Offered: Fall.

**Prereqs:** BIOL 3000 or BIOL 3800, PHYS 1111

**Coreqs:** FS 4300 Cooperative: open to WSU degree-seeking students

**FS 4300 Dairy Processing Lab (1 credit)**

Joint-listed with FS 5300

Hands-on training in processing of various dairy products (e. g. , fluid milk, butter, ice cream, cheese, and yogurt); milk pick-up and raw milk quality; cleaning and sanitation of dairy plants. Additional projects/assignments required for graduate credit. Typically Offered: Fall.

Cooperative: open to WSU degree-seeking students.

**FS 4320 Food Engineering (3 credits)**

Fundamentals of food engineering for improving the efficiency of food processing operations and the quality of processed food. Principles of heat transfer, steam, air-vapor mixtures, refrigeration and fluid flow as applied to food processing and storage. Recommended preparation: PHYS 1111.

**Prereqs:** FS 3020 and FS 3030

**Coreqs:** FS 4330 Cooperative: open to WSU degree-seeking students

**FS 4330 Food Engineering Lab (1 credit)**

Enhances the learning experience of the students taking FS 4320 through laboratories, problem sessions and group discussions. Prereqs or

**Coreqs:** FS 4320 Cooperative: open to WSU degree-seeking students

**FS 4360 Principles of Sustainability (3 credits)**

Cross-listed with ENVS 4360, SOIL 4360

Joint-listed with ENVS 5360, FS 5360

, SOIL 5360. Presented as online doculectures, covering topics such as origins of sustainability, standards of sustainability, culture of waste, built environment, industrial sustainability, energy sustainability, water resources, measuring sustainability, sustainable impact assessment, and our sustainable future. Readings and homework are assigned with each topic. Learning assessment will be from homework, exams and written papers. Additional work is required for graduate credit. Typically Offered: Fall and Spring.

**Prereqs:** Junior standing or higher Cooperative: open to WSU degree-seeking students.

**FS 4600 Food Chemistry (3 credits)**

Fundamentals of food chemistry; composition of foods and the changes that occur during processing. Typically Offered: Fall.

**Prereqs:** CHEM 2750 or CHEM 2770 and CHEM 2780, and BIOL 3000 or BIOL 3800 Cooperative: open to WSU degree-seeking students.

**FS 4610 Food Chemistry Lab (1 credit)**

Experiments related to properties, reactions, and interactions of chemical components of foods. Typically Offered: Fall.

**Coreqs:** FS 4600 Cooperative: open to WSU degree-seeking students

**FS 4640 Food Toxicology (3 credits)**

Cross-listed with SOIL 4640

Joint-listed with FS 5640, SOIL 5640

General principles of toxicologic evaluation of chemicals, which intentionally or unintentionally enter the food chain. Toxicology of food additives, colors, preservatives, drugs, pesticides and natural toxins in foods and risk characterization. Additional projects/assignments required for graduate credit. Typically Offered: Fall.

**Prereqs:** BIOL 3000 or BIOL 3800 Cooperative: open to WSU degree-seeking students.

**FS 4700 Advanced Food Technology (3 credits)**

Joint-listed with FS 5700

Physical principles of food preservation and recent advances in food technology including process control and control systems. Recommended Preparation: FS 4320 and FS 4600. Additional projects/assignments required for graduate credit. Typically Offered: Spring.

**Prereqs:** FS 3020 or FS 3030 Cooperative: open to WSU degree-seeking students.

**FS 4890 Food Product Development (3 credits)**

General Education: Capstone Experience

Course serves as a capstone experience for food science seniors and will require the application of food chemistry, food processing/engineering, and microbiology course knowledge in formulating a new food product. Typically Offered: Spring.

**Prereqs:** FS 3020, FS 3030, FS 4160, and FS 4600; and Senior standing Cooperative: open to WSU degree-seeking students.

**FS 4980 (s) Internship (1-16 credits, max 99)**

Credit arranged. Supervised professional internship in the food industry; requires formal written plan of activities approved by academic advisor and department head. Final written report and presentation required.

**Prereqs:** Department Permission Cooperative: open to WSU degree-seeking students.

**FS 4990 (s) Directed Study (1-16 credits, max 99)**

Credit arranged. Cooperative: open to WSU degree-seeking students.

**FS 5000 Master's Research & Thesis (1-16 credits, max 99)**

Credit arranged

**FS 5010 (s) Seminar (1-16 credits, max 99)**

Credit arranged

**FS 5020 (s) Directed Study (1-16 credits, max 99)**

Credit arranged Cooperative: open to WSU degree-seeking students.

**FS 5030 (s) Workshop (1-16 credits, max 99)**

Credit arranged. Workshops focusing on food science. Cooperative: open to WSU degree-seeking students.

**FS 5040 (s) Special Topics (1-16 credits, max 99)**

Credit arranged. Topics in food science. Cooperative: open to WSU degree-seeking students.

**FS 5090 Principles of Environmental Toxicology (3 credits)**

Cross-listed with ENVS 5090, SOIL 5090

Joint-listed with SOIL 4090

Fundamental toxicological concepts including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity and teratogenesis, mutagenesis, and carcinogenesis; chemodynamics of environmental contaminants including transport, fate, and receptors; chemicals of environmental interest and how they are tested and regulated; risk assessment fundamentals. Graduate students are required to prepare an additional in-depth report. Recommended Preparation: BIOL 1020 or BIOL 1150, CHEM 1111, CHEM 1120, CHEM 2750, and STAT 2510. Typically Offered: Varies. Cooperative: open to WSU degree-seeking students.

**FS 5100 Functional Foods and Health (3 credits)**

Functional foods are foods that provide health benefits beyond basic nutrition. This course will deal with the actions of bioactive compounds in functional foods and nutraceuticals as they relate to disease prevention and health promotion. In addition, this course will cover (1) the chemistry and mechanism of action of the various bioactive compounds, and (2) the safety, efficacy, stability, and regulatory aspects of functional foods and nutraceuticals. The course is intended for graduate students in food science, nutrition, or related biological science fields. Cooperative: open to WSU degree-seeking students.

**FS 5170 Scientific Writing (2 credits, max 4)**

Planning, writing, reporting, reviewing, and evaluating current food-related research. Preference will be given to graduate students in their second year or higher of study. Cooperative: open to WSU degree-seeking students.

**FS 5180 Oral Seminar (1 credit)**

Development of skills and communication tools and techniques for oral presentations of current food science research. Additional projects/ assignments required for graduate credit. Preference will be given to graduate students in their second year or higher of study. Cooperative: open to WSU degree-seeking students.

**FS 5290 Dairy Processing (3 credits)**

Joint-listed with FS 4290

Basic dairy chemistry, microbiology, and processing from cow to consumer; dairy quality, safety, and sanitation; milk components, fluid milk, concentrated milk, cream, butter, ice cream, fermented milk, cheese, and dairy powders. Additional projects/assignments required for graduate credit. Recommended Preparation: FS 1100, FS 1130. Typically Offered: Fall.

**Coreqs:** FS 4300 Cooperative: open to WSU degree-seeking students

**FS 5300 Dairy Processing Lab (1 credit)**

Joint-listed with FS 4300

Hands-on training in processing of various dairy products (e. g. , fluid milk, butter, ice cream, cheese, and yogurt); milk pick-up and raw milk quality; cleaning and sanitation of dairy plants. Additional projects/ assignments required for graduate credit. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

**FS 5320 Advanced Food Microbiology (3 credits)**

Discuss current topics in foodborne pathogen including novel detection, method, virulence, and pathogenesis, and their interaction with environment and host. Recommended Preparation: BIOL 1150, BIOL 2500, and FS 4160. Cooperative: open to WSU degree-seeking students.

**FS 5360 Principles of Sustainability (3 credits)**

Cross-listed with ENVS 5360, SOIL 5360

Joint-listed with ENVS 4360, FS 4360

, SOIL 4360. Presented as online doculectures, covering topics such as origins of sustainability, standards of sustainability, culture of waste, built environment, industrial sustainability, energy sustainability, water resources, measuring sustainability, sustainable impact assessment, and our sustainable future. Readings and homework are assigned with each topic. Learning assessment will be from homework, exams and written papers. Additional work is required for graduate credit. Typically Offered: Fall and Spring. Cooperative: open to WSU degree-seeking students.

**FS 5640 Food Toxicology (3 credits)**

Cross-listed with SOIL 5640

Joint-listed with FS 4640, SOIL 4640

General principles of toxicologic evaluation of chemicals, which intentionally or unintentionally enter the food chain. Toxicology of food additives, colors, preservatives, drugs, pesticides and natural toxins in foods and risk characterization. Additional projects/assignments required for graduate credit. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

**FS 5700 Advanced Food Technology (3 credits)**

Joint-listed with FS 4700

Physical principles of food preservation and recent advances in food technology including process control and control systems. Recommended Preparation: FS 4320 and FS 4600. Additional projects/ assignments required for graduate credit. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

**FS 5880 Food Science Teaching Practicum (1-3 credits)**

Supervised teaching in a university setting.

**Prereqs:** Admission to graduate program and Permission Cooperative: open to WSU degree-seeking students.

**FS 5980 (s) Internship (1-16 credits, max 99)**

Credit arranged Cooperative: open to WSU degree-seeking students.

**FS 5990 Non-thesis Master's Research (1-16 credits, max 99)**

Credit arranged

**FS 6000 Doctoral Research & Thesis (1-45 credits, max 99)**

Credit arranged