

FOOD SCIENCE AND TECHNOLOGY (FST)

FST 101. FOOD SCIENCE ORIENTATION. (1 Credit)

For food science majors. Orientation and academic guidance toward career planning in food science and technology.

FST 199. SPECIAL STUDIES. (1-16 Credits)

Graded P/N.

This course is repeatable for 16 credits.

FST 210. FRUIT AND VEGETABLE PROCESSING. (3 Credits)

Lectures, lab activities and plant tours to help majors and non-majors understand traditional and modern fruit and vegetable processing technologies.

Recommended: CH 123 or CH 223 or ((CH 233 or CH 233H) and (CH 263 or CH 263H))

FST 212. DAIRY PROCESSING. (2 Credits)

Methods of processing and preserving milk and milk products and related unit operations.

Recommended: CH 123 or CH 223 or CH 233 or CH 233H

FST 213. DAIRY PROCESSING LABORATORY. (1 Credit)

Laboratory and field work to accompany FST 212. Field trip required.

Recommended: Concurrent enrollment in FST 212

FST 251. INTRODUCTION TO WINES, BEERS, AND SPIRITS. (3 Credits)

A descriptive introduction to the history, science, sensory, economics, and societal aspects of alcoholic beverages.

Recommended: High school biology and chemistry

FST 260. *FOOD SCIENCE AND TECHNOLOGY IN WESTERN CULTURE. (3 Credits)

Exploring the sciences and technologies of food processing and preservation within the context of their historical, current, and possible future influences on what we eat, the structure of our society, and our day-to-day lives. (Bacc Core Course)

Attributes: CPWC – Core, Pers, West Culture

FST 273. *WINE IN THE WESTERN WORLD. (3 Credits)

A study of wine throughout history, from its accidental discovery and refinement through today, with a focus on the profound role wine plays in agriculture, social rituals, human health, economics, and the ambivalent pursuit of pleasure. (Baccalaureate Core Course)

Attributes: CPWC – Core, Pers, West Culture

FST 315. PILOT PLANT EXPERIENCES. (2 Credits)

Students will be working in one of the FST pilot plants (dairy, vegetables/fruit, brewing, wine making, distilling) and will be assisting with the manufacturing of foods or beverages. Students must have available blocks of time in their schedules to contribute significantly to a production run. Production schedules for each pilot plant will be determined in advance of registration for each term. Not all pilot plants will be available each term. Lab.

FST 360. FOOD SAFETY AND SANITATION. (3 Credits)

Principles, practices, and regulations governing and ensuring the microbiological safety of our food supply through risk assessment, surveillance, and intervention.

Prerequisites: (BI 211 with D- or better or BI 211H with D- or better or BI 212 with D- or better or BI 212H with D- or better or BI 213 with D- or better or BI 213H with D- or better) and (CH 121 [D-] or CH 221 [D-] or CH 221H [D-] or CH 231 [D-] or CH 231H [D-])

FST 370. INDUSTRY PREPARATION/HACCP. (3 Credits)

Assists students in preparation for internships and employment in the food industry by introducing compliance with food safety regulations, HACCP, and audits.

Recommended: One year of chemistry and one year of biology.

FST 385. *COMMUNICATING FOOD AND FERMENTATION SCIENCE. (3 Credits)

This writing intensive course (WIC) will guide students in the investigation and critical evaluation of literature on a topic of current interest in food or fermentation science, and the development of their ability to write concisely and with precision about technical subject matter in this discipline. Lec/rec. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC

Prerequisites: WR 121 with C- or better and FST 360 [D-] and MB 302 (may be taken concurrently) [D-]

Recommended: Completion of Bacc Core Writing II requirement

FST 399. SPECIAL TOPICS. (0-16 Credits)

Equivalent to: FST 399H

This course is repeatable for 16 credits.

FST 399H. SPECIAL TOPICS. (1-16 Credits)

Attributes: HNRS – Honors Course Designator

Equivalent to: FST 399

This course is repeatable for 16 credits.

FST 401. RESEARCH. (1-16 Credits)

This course is repeatable for 16 credits.

FST 403. THESIS. (1-16 Credits)

This course is repeatable for 16 credits.

FST 405. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

FST 407. SENIOR SEMINAR. (1 Credit)

FST 410. INTERNSHIP. (1-16 Credits)

A work internship to give students practical on-the-job training in the food processing or related industries. Graded P/N.

This course is repeatable for 16 credits.

FST 420. SENSORY EVALUATION OF FOOD. (4 Credits)

Sensory test methods used in the evaluation of the taste, smell, texture, and color of foods as well as the evaluation of consumer acceptance of foods. This includes methods for measuring sensory qualities, underlying psychological principles, statistical methods for analyzing data, and proper interpretation of these results. Lec/lab.

Prerequisites: (ST 351 with C- or better or ST 411 with C- or better) and (ST 352 (may be taken concurrently) [D-] or ST 412 (may be taken concurrently) [D-])

FST 421. *FOOD LAW. (3 Credits)

Concepts, statutes, regulations, and agencies controlling the production, processing, and distribution and promotion of food. (Bacc Core Course)

Attributes: CSST – Core, Synthesis, Science/Technology/Society

FST 422. FOOD CHEMISTRY FUNDAMENTALS. (4 Credits)

An integrated lecture/lab/recitation course applying theories of molecular reactivity to model food systems. Lectures focus on the molecular bases of chemical phenomena that dictate the behavior of foods. Laboratories and recitations provide opportunities for students to observe, manipulate, and explore model food systems. Emphasis on major food components (water, lipids, proteins, and carbohydrates) and their behavior under conditions of particular relevance to food processing. Lec/lab/rec.

Prerequisites: (BB 350 with D- or better or BB 450 with D- or better or BB 450H with D- or better) and (CH 332 [C-] or CH 336 [C-]) and (MTH 228 (may be taken concurrently) [D-] or MTH 252 (may be taken concurrently) [D-] or MTH 252H (may be taken concurrently) [D-])

FST 423. FOOD ANALYSIS. (4 Credits)

An integrated laboratory/lecture course covering methods used for the quantitative analysis of the chemical composition of foods and agricultural products.

Recommended: CH 324 and CH 337 and BB 350

FST 425. FOOD SYSTEMS CHEMISTRY. (4 Credits)

The chemistry of food components in real-world food systems. Focused on water, proteins, carbohydrates, lipids, and food polymers, their interactions, and the effects of food processing and storage. Integrates writing as a learning tool and means of professional communication. Lec/lab/rec.

Prerequisites: FST 422 with D- or better

FST 430. INNOVATION AND FOOD PRODUCT DEVELOPMENT. (4 Credits)

Provides technical background and hand-on laboratory experience in food product development and food innovation. Lec/lab.

Prerequisites: CH 331 with D- or better and CH 332 [D-] and FST 360 [D-] and FST 421 [D-] and FST 422 [D-]

FST 437. CHEMISTRY AND BIOCHEMISTRY OF DISTILLED SPIRITS. (3 Credits)

The underlying science of the production of the distilled spirits will be discussed systematically. The course will cover the requirements for water, the major raw materials (eg. cereals, fruits, agave, syrups, and woods for maturation) and the conversion of these into fermentable extract. The scientific principles of fermentation will be explored, in the context of both ethanol and secondary metabolite production. Distillation will be considered, in terms of the physics and chemistry of liquid-liquid separations, before discussing post-fermentation options such as blending, maturation and product finishing.

Prerequisites: FST 251 with C- or better and BB 350 (may be taken concurrently) [D-]

FST 438. PRODUCTION AND ANALYSIS OF DISTILLED SPIRITS. (3 Credits)

Building on the prerequisite course, this course compares and contrasts different approaches to the manufacture of distilled spirits by using some of the major spirit categories as examples. The management of a distilled spirits production plant in terms of legislative, safety and process/ product quality will be discussed before explicit consideration of the requirements for establishing a distilled spirits production plant. Successful completion of this course will provide students with a broad understanding of the distilled spirits sector.

Prerequisites: FST 437 with D- or better

This course is repeatable for 3 credits.

FST 460. BREWING SCIENCE. (3 Credits)

Chemistry, microbiology and engineering of malting and brewing operations for the production of beer, including the compositional analysis of barley, malt, hops, water, and beer and their effects on beer quality.

Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-]

Recommended: Completion or concurrent enrollment in BEE 472 and MB 302

FST 461. BREWING ANALYSIS. (3 Credits)

Compositional analysis, laboratory techniques and sensory evaluation of barley, malt, hops, water, yeast and beer. Lec/lab.

Prerequisites: FST 460 with D- or better and (MB 303 [D-] or MB 303H [D-])

FST 466. WINE PRODUCTION PRINCIPLES. (3 Credits)

Principles of wine production technology from grape berry development through bottling, covering the microbiology and chemistry of fermentation, aging and production practices of red and white table wines, as well as sparkling and dessert wines.

Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-]

Recommended: BB 350 and MB 302

FST 467. WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION. (5 Credits)

An integrated lecture/lab course that focuses on the practical fundamentals of red and white wine production. Students will make wine and monitor its progression from the grape to the bottle using standard chemical, microbial, and sensorial techniques.

Prerequisites: FST 466 with D- or better and FST 479 (may be taken concurrently) [D-]

FST 479. FERMENTATION MICROBIOLOGY. (3 Credits)

An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. CROSSLISTED as MB 479/MB 579.

Prerequisites: (BI 212 with C- or better or BI 212H with C- or better) and CH 331 [C-] and CH 332 [C-] and (BB 350 [D-] or BB 450 [D-]) and MB 302 [D-]

Equivalent to: MB 479

FST 480. TOPICS IN FERMENTATION. (0-2 Credits)

Selected topics in fermentation science will be presented by department faculty and invited outside experts. Topics and format will change each quarter. Students may take the course for 1 or 2 credits as the topics change. Lec/lab.

This course is repeatable for 8 credits.

FST 490. FOOD PROCESSING CALCULATIONS. (2 Credits)

Application of engineering principles to produce safe processed foods meeting consumer expectations for safety and quality. Validate process engineering models by comparing predicted values with new experimental data.

Prerequisites: BEE 472 with D- or better and FST 360 [D-]

Corequisites: FST 491

FST 491. FOOD PROCESSING CALCULATIONS LABORATORY. (1 Credit)

Experiments in a pilot plant supported by a computer laboratory. Prepare samples of novel process technology products.

Corequisites: FST 490

Recommended: Microsoft Excel skills.

FST 495. FOOD PACKAGING. (2 Credits)

Fundamentals of food packaging covering the major packaging solutions with a focus on plastic, paper, and paperboard.

FST 499. SPECIAL STUDIES. (0-16 Credits)

This course is repeatable for 16 credits.

FST 501. RESEARCH. (1-16 Credits)

PREREQ: Departmental approval required.

This course is repeatable for 16 credits.

FST 503. THESIS. (1-16 Credits)

This course is repeatable for 999 credits.

FST 505. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

FST 507. SEMINAR. (1 Credit)

This course is repeatable for 4 credits.

FST 509. PRACTICUM IN TEACHING. (1-16 Credits)

This course is repeatable for 16 credits.

FST 510. INTERNSHIP. (1-16 Credits)

This course is repeatable for 16 credits.

FST 514. HEALTH BENEFITS OF FUNCTIONAL FOODS, NUTRACEUTICALS AND DIETARY SUPPLEMENTS. (3 Credits)

Functional foods, nutraceuticals and dietary supplements represent a rapidly expanding segment of domestic and international markets. This course will overview the principles and procedures necessary to evaluate and market these products. The chemistry and mechanisms of major nutraceutical ingredient categories and current scientific information supporting their biochemical and physiological efficacy will be addressed. Special dietary products, such as medical, weight control, sport, and herbal supplements, will be addressed. Regulatory aspects of labeling and structure-function claims will be covered. CROSSLISTED as NUTR 514.

Equivalent to: NFM 514, NUTR 514

Recommended: BB 350 and CH 332

FST 520. SENSORY EVALUATION OF FOOD. (4 Credits)

Sensory test methods used in the evaluation of the taste, smell, texture, and color of foods as well as the evaluation of consumer acceptance of foods. This includes methods for measuring sensory qualities, underlying psychological principles, statistical methods for analyzing data, and proper interpretation of these results. Lec/lab.

Recommended: Completion of ST 351 or ST 411 and completion or concurrent enrollment in ST 352 or ST 412

FST 521. FOOD LAW. (3 Credits)

Concepts, statutes, regulations, and agencies controlling the production, processing, and distribution and promotion of food.

FST 522. FOOD CHEMISTRY FUNDAMENTALS. (4 Credits)

An integrated lecture/lab/recitation course applying theories of molecular reactivity to model food systems. Lectures focus on the molecular bases of chemical phenomena that dictate the behavior of foods. Laboratories and recitations provide opportunities for students to observe, manipulate, and explore model food systems. Emphasis on major food components (water, lipids, proteins, and carbohydrates) and their behavior under conditions of particular relevance to food processing. Lec/lab/rec.

Recommended: (BB 350 or BB 450 or BB 450H) and (CH 332 or CH 336) and (MTH 228 or MTH 252 or MTH 252H)

FST 523. FOOD ANALYSIS. (4 Credits)

An integrated laboratory/lecture course covering methods used for the quantitative analysis of the chemical composition of foods and agricultural products.

Recommended: CH 324 and CH 337 and BB 350

FST 525. FOOD SYSTEMS CHEMISTRY. (4 Credits)

The chemistry of food components in real-world food systems. Focused on water, proteins, carbohydrates, lipids, and food polymers, their interactions, and the effects of food processing and storage. Integrates writing as a learning tool and means of professional communication. Lec/lab/rec.

Prerequisites: FST 522 with C or better

FST 537. CHEMISTRY AND BIOCHEMISTRY OF DISTILLED SPIRITS. (3 Credits)

The underlying science of the production of the distilled spirits will be discussed systematically. The course will cover the requirements for water, the major raw materials (eg. cereals, fruits, agave, syrups, and woods for maturation) and the conversion of these into fermentable extract. The scientific principles of fermentation will be explored, in the context of both ethanol and secondary metabolite production. Distillation will be considered, in terms of the physics and chemistry of liquid-liquid separations, before discussing post-fermentation options such as blending, maturation and product finishing.

FST 538. PRODUCTION AND ANALYSIS OF DISTILLED SPIRITS. (3 Credits)

Building on the prerequisite course, this course compares and contrasts different approaches to the manufacture of distilled spirits by using some of the major spirit categories as examples. The management of a distilled spirits production plant in terms of legislative, safety and process/ product quality will be discussed before explicit consideration of the requirements for establishing a distilled spirits production plant. Successful completion of this course will provide students with a broad understanding of the distilled spirits sector.

Prerequisites: FST 537 with D- or better

This course is repeatable for 3 credits.

FST 560. BREWING SCIENCE. (3 Credits)

Chemistry, microbiology and engineering of malting and brewing operations for the production of beer, including the compositional analysis of barley, malt, hops, water, and beer and their effects on beer quality.

Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and completion or concurrent enrollment in BEE 472 and MB 302

FST 561. BREWING ANALYSIS. (3 Credits)

Compositional analysis, laboratory techniques and sensory evaluation of barley, malt, hops, water, yeast and beer. Lec/lab.

Recommended: FST 460 and (MB 303 or MB 303H)

FST 566. WINE PRODUCTION PRINCIPLES. (3 Credits)

Principles of wine production technology from grape berry development through bottling, covering the microbiology and chemistry of fermentation, aging and production practices of red and white table wines, as well as sparkling and dessert wines.

Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and BB 350 and MB 302

FST 567. WINE PRODUCTION, ANALYSIS, AND SENSORY EVALUATION. (5 Credits)

An integrated lecture/lab course that focuses on the practical fundamentals of red and white wine production. Students will make wine and monitor its progression from the grape to the bottle using standard chemical, microbial, and sensorial techniques.

Prerequisites: FST 566 with C or better

Corequisites: FST 579

FST 579. FERMENTATION MICROBIOLOGY. (3 Credits)

An introduction to industrial microbiology with a focus on the physiology of fermentation and use of microorganisms for the production of food ingredients, fermented foods, and beverages. FST students need to take BB 350 and MB students need to take BB 450 for their respective majors. **CROSSLISTED** as MB 479/MB 579.

Equivalent to: MB 579

Recommended: (BI 212 or BI 212H) and CH 331 and CH 332 and (BB 350 or BB 450) and MB 302

FST 599. SPECIAL STUDIES. (0-16 Credits)

This course is repeatable for 16 credits.

FST 601. RESEARCH. (1-16 Credits)

This course is repeatable for 16 credits.

FST 603. THESIS. (1-16 Credits)

This course is repeatable for 999 credits.

FST 605. READING AND CONFERENCE. (1-16 Credits)

This course is repeatable for 16 credits.

FST 607. SEMINAR. (1 Credit)

This course is repeatable for 4 credits.

FST 620. ADVANCED TOPICS IN SENSORY SCIENCE. (2 Credits)

Current and/or advanced subjects in human sensory science. Includes 1) topics in human flavor perception that covers human psychophysics, neuroscience, and related fields, and 2) sensory evaluation techniques and data handling methods that are advanced in nature. Different points of view regarding above topics will be discussed.

Prerequisites: FST 520 with C or better

This course is repeatable for 4 credits.

FST 628. FLAVOR CHEMISTRY. (3 Credits)

The definition of flavor, analytical methods in flavor chemistry, and mechanisms of odor interaction in food system will be discussed. In addition, an integrated approach will be used to study the flavor chemistry of economically-important agricultural products in the Pacific Northwest such as dairy products, fruits, and alcoholic beverages.

Recommended: FST 522 and FST 523

FST 639. FOOD POLYMER SCIENCE. (3 Credits)

Investigates the theoretical principles and structure-function relationships of food macromolecules. The theoretical principles are related, where possible, to observable phenomena during thermal processing and storage of foods.

Recommended: (FST 422 or FST 522) and (FST 425 or FST 525)

FST 641. PROCESSING WHEAT AND OTHER SMALL GRAINS: A MOLECULAR VIEW. (3 Credits)

Provides a fundamental overview of wheat and other cereals from the perspective of the molecular level events that are important in milling, baking, and other processes. Uses cereal processing (focused primarily on bread-making) as the vehicle for placing elements of food chemistry, food polymer science, physical chemistry, and rheology into the cohesive framework of a single food category. Students will experience how the sciences of chemistry, physics, engineering, microbiology, biochemistry, nutrition, etc. amalgamate in the production of the selected cereal products. Lec/lab.

FST 666. ADVANCED TOPICS IN ENOLOGY. (3 Credits)

An in-depth investigation of advanced wine processing techniques and wine research, focusing on their impact on production and wine quality.

Prerequisites: FST 566 with B or better and FST 567 (may be taken concurrently) [B]

Recommended: Viticulture course such as HORT 454 and good understanding of how vineyard practices influence grape quality