

# Cereal & Food Sciences (CFS)

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**CFS 194. Individual Study. 1-3 Credits.**

**CFS 196. Field Experience. 1-15 Credits.**

**CFS 199. Special Topics. 1-5 Credits.**

**CFS 200. Introduction to Food Systems. 3 Credits.**

The fundamentals of food science and food safety will be introduced with emphasis on how food components and processing affect quality and safety of foods.

**CFS 210. Introduction to Food Science and Technology. 2 Credits.**

Overview of food components, food quality, nutrition, processing, packaging, safety, sanitation laws, sensory evaluation, distribution, and utilization.

**CFS 291. Seminar. 1-3 Credits.**

**CFS 292. Study Abroad. 1-15 Credits.**

**CFS 294. Individual Study. 1-5 Credits.**

**CFS 299. Special Topics. 1-5 Credits.**

**CFS 370. Food Processing I. 3 Credits.**

This course is designed to provide students with an introduction to food processing methods. The course will provide hands-on experience with a focus on basic food processing methods. Recommended Prereq: CFS 210.

**CFS 379. Study Tour Abroad. 1-6 Credits.**

**CFS 391. Seminar. 1-3 Credits.**

**CFS 392. Study Abroad. 1-15 Credits.**

**CFS 394. Individual Study. 1-5 Credits.**

**CFS 397. Fe/Coop Ed/Internship. 1-4 Credits.**

**CFS 399. Special Topics. 1-5 Credits.**

**CFS 430. Food Unit Operations. 2 Credits.**

Thermodynamics, materials and energy balance, fluid flow, heat transfer, heat exchange, all related to food processing. Prereq: MATH 147, PHYS 211, PHYS 211L. {Also offered for graduate credit - see CFS 630.}

**CFS 450. Cereal Technology. 3 Credits.**

Discussion of cereal grains, their properties, evaluation, and utilization. {Also offered for graduate credit - see CFS 650.}

**CFS 452. Food Laws and Regulations. 3 Credits.**

Regulations, laws, and dynamics governing development of food policy. Prereq: SAFE 470. Cross-listed with SAFE 452 and AGE 452. {Also offered for graduate credit - see CFS 652.}

**CFS 460. Food Chemistry. 3 Credits.**

Study of food components including water, carbohydrates, lipids, proteins, vitamins, minerals, and enzymes. Recommended Prereq: CFS 210, CHEM 341, CHEM 341L. {Also offered for undergraduate credit - see CFS 660.}

**CFS 461. Food Chemistry Laboratory. 1 Credit.**

Laboratory isolation, observation of characteristics, and quantitation of food components. Recommended Coreq: CFS 460. {Also offered for graduate credit - see CFS 661.}

**CFS 464. Food Analysis. 3 Credits.**

Principles, applications, and practice of methods for quantitative determination of food components. 2 lectures, 1 three-hour laboratory. Recommended Prereq: BIOC 460, CFS 460. {Also offered for graduate credit - see CFS 664.}

**CFS 470. Food Processing II. 3 Credits.**

This course is designed to provide students with an in-depth academic and practical exposure to food processing methods and the food industry. Concepts in quality control systems and sanitation will be discussed. Recommended Prereq: CFS 370. {Also offered for graduate credit - see CFS 670.}

**CFS 471. Food Processing Laboratory. 1 Credit.**

Field trips, experiments on freezing, freeze-drying, spray drying, canning, beverage production, water activity measurements, shelf life, and quality control. Recommended Coreq: CFS 470. {Also offered for graduate credit - see CFS 671.}

**CFS 474. Sensory Science of Foods. 2 Credits.**

The science used in the evaluation of flavor, color, and texture of foods. Experiential approaches will be used to evaluate sensory characteristics of foods. Recommended Prereq: CFS 460 and STAT 330. {Also offered for graduate credit - see CFS 674.}

**CFS 480. Food Product Development. 3 Credits.**

This course is designed to provide students the opportunity to incorporate the basic principles of food science in the theoretical development of food products. (Food Science Capstone) Prereq: CFS 453, CFS 460, CFS 464, CFS 470. {Also offered for graduate credit - see CFS 680.}.

**CFS 491. Seminar. 1-5 Credits.**

**CFS 492. Study Abroad. 1-15 Credits.**

**CFS 494. Individual Study. 1-5 Credits.**

**CFS 496. Field Experience. 1-15 Credits.**

**CFS 499. Special Topics. 1-5 Credits.**

**CFS 630. Food Unit Operations. 2 Credits.**

Thermodynamics, materials and energy balance, fluid flow, heat transfer, heat exchange, all related to food processing. {Also offered for undergraduate credit - see CFS 430.}.

**CFS 650. Cereal Technology. 3 Credits.**

Discussion of cereal grains, their properties, evaluation, and utilization. {Also offered for undergraduate credit - see CFS 450.}.

**CFS 652. Food Laws and Regulations. 3 Credits.**

Regulations, laws, and dynamics governing development of food policy. Cross-listed with SAFE 652 and AGECE 652. {Also offered for undergraduate credit - see CFS 452.}.

**CFS 660. Food Chemistry. 3 Credits.**

Study of food components including water, carbohydrates, lipids, proteins, vitamins, minerals, and enzymes. {Also offered for undergraduate credit - see CFS 440.}.

**CFS 661. Food Chemistry Laboratory. 1 Credit.**

Laboratory isolation, observation of characteristics, and quantitation of food components. Coreq: CFS 660. {Also offered for undergraduate credit - see CFS 461.}.

**CFS 664. Food Analysis. 3 Credits.**

Principles, applications, and practice of methods for quantitative determination of food components. 2 lectures, 1 three-hour laboratory. Prereq: CFS 660. {Also offered for undergraduate credit - see CFS 464.}.

**CFS 670. Food Processing II. 3 Credits.**

This course is designed to provide students with an in-depth academic and practical exposure to food processing methods and the food industry. Concepts in quality control systems and sanitation will be discussed. {Also offered for undergraduate credit - see CFS 470.}.

**CFS 671. Food Processing Laboratory. 1 Credit.**

Field trips, experiments on freezing, freeze-drying, spray drying, canning, beverage production, water activity measurements, shelf life, and quality control. Coreq: CFS 670. {Also offered for undergraduate credit - see CFS 471.}.

**CFS 674. Sensory Science of Foods. 2 Credits.**

The science used in the evaluation of flavor, color, and texture of foods. Experiential approaches will be used to evaluate sensory characteristics of foods. Prereq: CFS 660. {Also offered for undergraduate credit - see CFS 474.}.

**CFS 680. Food Product Development. 3 Credits.**

This course is designed to provide students the opportunity to incorporate the basic principles of food science in the theoretical development of food products. {Also offered for undergraduate credit - see CFS 480.}.

**CFS 690. Graduate Seminar. 1-3 Credits.**

**CFS 692. Study Abroad. 1-15 Credits.**

Pre-arranged study at accredited foreign institutions or in approved study abroad programs.

**CFS 695. Field Experience. 1-15 Credits.**

**CFS 696. Special Topics. 1-5 Credits.**

**CFS 725. Food Policy. 3 Credits.**

Provides quantitative tools and models used to analyze general food safety policies. Three lectures. Prereq: SAFE 670. Cross-listed with AGECE 725 and SAFE 725.

**CFS 758. Fundamentals of Flour Testing and Baking. 3 Credits.**

Flour testing, industrial, and experimental bread baking. Production methods, ingredients, and baking reactions. Lectures and laboratories. Prereq: CFS 650.

**CFS 759. Milling. 3 Credits.**

Experimental and industrial feed and flour milling. Production, equipment, and factors involved in the milling process. Lectures and laboratories. Prereq: CFS 650.

**CFS 760. Pasta Processing. 3 Credits.**

Durum wheat quality, pasta production, and pasta quality evaluation. Lectures and laboratories. Prereq: CFS 650.

**CFS 761. Malting and Brewing. 3 Credits.**

Barley and malt quality; malting and brewing. Lectures and laboratories. Prereq: CFS 650.

**CFS 764. Carbohydrate Chemistry. 2 Credits.**

This course focuses on developing i) knowledge on structural features of carbohydrates and ii) skills for structural characterization of carbohydrates in plants and microorganisms using analytical methods. Recommended prereq: Introductory Chemistry/Biochemistry class.

**CFS 765. Advanced Cereal and Food Chemistry I. 4 Credits.**

Physiochemical, structural, functional, and analysis of cereal and food carbohydrates and enzymes. Biochemical aspects of these components will also be presented.

**CFS 766. Advanced Cereal and Food Chemistry II. 4 Credits.**

Physiochemical, structural, and functional properties of cereal and food proteins and lipids in food systems.

**CFS 790. Graduate Seminar. 1-3 Credits.****CFS 791. Temporary/Trial Topics. 1-5 Credits.****CFS 793. Individual Study. 1-5 Credits.****CFS 794. Practicum/Internship. 1-8 Credits.****CFS 795. Field Experience. 1-15 Credits.****CFS 796. Special Topics. 1-5 Credits.****CFS 797. Master's Paper. 1-3 Credits.****CFS 798. Master's Thesis. 1-10 Credits.****CFS 892. Graduate Teaching Experience. 1-6 Credits.****CFS 899. Doctoral Dissertation. 1-15 Credits.**