

MAJOR IN FERMENTATION AND FOOD SCIENCE, FERMENTATION SCIENCE AND TECHNOLOGY CONCENTRATION

The Fermentation Science and Technology concentration blends a strong science base with courses in organic chemistry, microbiology, physics, biochemistry, food chemistry, and food safety with applied courses in brewing science. The curriculum prepares students for employment in the fermented food and beverage industry. The concentration provides a strong background for pursuing a graduate program.

Learn more about the Fermentation Science and Technology concentration on the Department of Food Science and Human Nutrition website (<https://www.chhs.colostate.edu/fshn/programs-and-degrees/b-s-in-fermentation-science-and-technology/>).

Learning Objectives

Upon successful completion, students will be able to:

1. Integrate and apply information from basic nutrition, food sciences, and biological and chemical concepts/processes to understand the production and quality of foods; and comprehend approaches used to analyze the relationships among production of foods, nutrition, and food safety.
2. Demonstrate discipline-specific knowledge of the skills and competencies needed in food science and fermentation science and technology, including food microbiology, sensory evaluation, food chemistry, quality assessment, food production management, and the role of food in the promotion of health.
3. Analyze the production, service, and consumption of foods and beverages, including financial aspects, functional skills, and efficient management of resources with emphasis on safe service training and management.
4. Assess and apply the science, history, culture, safety, health, and nutrition dimensions of foods and beverages to the food industry.

Requirements

Effective Fall 2026

Freshman

		AUCC	Credits	
CO 150	College Composition (GT-CO2)	1A	3	
FTEC 115	Cultural Aspects of Fermented Foods	1C	3	
FTEC 155	Introduction to Food Science	3A	3	
MATH 117	College Algebra in Context I (GT-MA1)	1B	1	
MATH 118	College Algebra in Context II (GT-MA1)	1B	1	
MATH 124	Logarithmic and Exponential Functions (GT-MA1)	1B	1	
SOC 100	Introduction to Sociology (GT-SS3)	3C	3	
Select one group from the following:			4	
Group A:				
BZ 110	Principles of Animal Biology (GT-SC2)	3A	5-8	
BZ 111	Animal Biology Laboratory (GT-SC1)	3A		
Group B:				
LIFE 102	Attributes of Living Systems (GT-SC1)	3A		
Select one group from the following:			5-8	
Group A:				
CHEM 107	Fundamentals of Chemistry (GT-SC2)	3A	3	
CHEM 108	Fundamentals of Chemistry Laboratory (GT-SC1)	3A		
Group B:				
CHEM 111	General Chemistry I (GT-SC2)	3A	3	
CHEM 112	General Chemistry Lab I (GT-SC1)	3A		
CHEM 113	General Chemistry II			
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			3	

Total Credits

27-30

Sophomore

CHEM 245	Fundamentals of Organic Chemistry	4
CHEM 246	Fundamentals of Organic Chemistry Laboratory	1

FTEC 210	Science of Food Fermentation		3
FTEC 292	Careers in Fermentation and Food Science		1
SPCM 200	Public Speaking		3
Select one group from the following:			5
Group A:			
LIFE 205	Microbial Biology		
LIFE 206	Microbial Biology Laboratory		
Group B:			
MIP 300	General Microbiology		
MIP 302	General Microbiology Laboratory		
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			3B
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			3D
Electives (see list below) ¹			6
Total Credits			29

Junior

BC 351	Principles of Biochemistry		4
FTEC 350	Fermentation Microbiology	4B	3
FTEC 360	Brewing Processes	4A	4
FTEC 447	Food Chemistry		3
HEM 330	Alcohol Beverage Control and Management		2
MIP 334	Food Microbiology		3
Select one course from the following:			3
CO 300	Writing Arguments (GT-CO3)	2	
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)	2	
CO 301C	Writing in the Disciplines: Social Sciences (GT-CO3)	2	
JTC 300	Strategic Writing and Communication (GT-CO3)	2	
Select one course from the following:			3
STAT 201	General Statistics (GT-MA1)	1B	
STAT 204	Statistics With Business Applications (GT-MA1)	1B	
Elective (See list below) ¹			3
Total Credits			28

Senior

FTEC 400	Food Safety		3
FTEC 422	Brewing Science I		5
FTEC 430	Sensory Evaluation of Food Products		2
FTEC 460	Brewing Science II		5
FTEC 465	Food Production Operations		3
FTEC 492 ²	Senior Seminar Fermentation and Food Science	4C	4
Electives (See list below) ¹			11-14
Total Credits			33-36
Program Total Credits:			120

Department Electives

Code	Title	AUCC	Credits
ANEQ 360	Principles of Meat Science		3
CBE 205/BIOM 205	Biological and Cellular Engineering		3
FTEC 110	Food-From Farm to Table		3

FTEC 205	Beer Styles and Tasting		2
FTEC 351	Fermentation Microbiology Laboratory		2
FTEC 375	Introduction to Fermentation Unit Operations		4
FTEC 487	Internship		3
FTEC 495	Independent Study		1-6
FTEC 570	Food Product Development		2
FTEC 572	Food Biotechnology		2
FTEC 574	Current Issues in Food Safety		2
HEM 335/FSHN 335	Food, Society and Social Media		3
MATH 126	Analytic Trigonometry (GT-MA1)	1B	1
MATH 141	Calculus in Management Sciences (GT-MA1)	1B	3-4
or MATH 155	Calculus for Biological Scientists I (GT-MA1)		
MGT 305	Fundamentals of Management		3
MGT 430	Leadership and Social Responsibility		3
MIP 335	Food Microbiology Laboratory		2
PH 121	General Physics I (GT-SC1)	3A	5
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	5

¹ Students may select from the Department Electives course list, or they may select any course as a free elective. Select enough elective credits to bring the program total to 120 credits, of which at least 42 must be upper-division (300- to 400-level).

² FTEC 492 should be taken in both semesters of Senior year.

Major Completion Map

Freshman

Semester 1		Critical	Recommended	AUCC	Credits
FTEC 155	Introduction to Food Science	X		3A	3
MATH 117	College Algebra in Context I (GT-MA1)	X		1B	1
MATH 118	College Algebra in Context II (GT-MA1)	X		1B	1
MATH 124	Logarithmic and Exponential Functions (GT-MA1)	X		1B	1
Select one group from the following:		X			4
Group A:					
BZ 110	Principles of Animal Biology (GT-SC2)	X		3A	
BZ 111	Animal Biology Laboratory (GT-SC1)	X		3A	
Group B:					
LIFE 102	Attributes of Living Systems (GT-SC1)	X		3A	
Select one group from the following:		X			5
Group A:					
CHEM 107	Fundamentals of Chemistry (GT-SC2)	X		3A	
CHEM 108	Fundamentals of Chemistry Laboratory (GT-SC1)	X		3A	
Group B:					
CHEM 111	General Chemistry I (GT-SC2)	X		3A	
CHEM 112	General Chemistry Lab I (GT-SC1)	X		3A	

Total Credits					15
Semester 2		Critical	Recommended	AUCC	Credits
CO 150	College Composition (GT-CO2)	X		1A	3
FTEC 115	Cultural Aspects of Fermented Foods	X		1C	3
SOC 100	Introduction to Sociology (GT-SS3)	X		3C	3
Select Group B if Group B was selected in the first semester.		X			0-3

Group B:						
CHEM 113	General Chemistry II	X				
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B		3
Total Credits						12-15
Sophomore						
Semester 3		Critical	Recommended	AUCC		Credits
CHEM 245	Fundamentals of Organic Chemistry	X				4
CHEM 246	Fundamentals of Organic Chemistry Laboratory	X				1
FTEC 210	Science of Food Fermentation	X				3
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B		3
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			X	3D		3
Total Credits						14
Semester 4		Critical	Recommended	AUCC		Credits
FTEC 292	Careers in Fermentation and Food Science	X				1
SPCM 200	Public Speaking	X				3
Select one group from the following:		X				5
Group A:						
LIFE 205	Microbial Biology					
LIFE 206	Microbial Biology Laboratory					
Group B:						
MIP 300	General Microbiology					
MIP 302	General Microbiology Laboratory					
Electives (see list on Program Requirements tab)			X			6
Total Credits						15
Junior						
Semester 5		Critical	Recommended	AUCC		Credits
BC 351	Principles of Biochemistry	X				4
FTEC 350	Fermentation Microbiology	X		4B		3
FTEC 447	Food Chemistry	X				3
HEM 330	Alcohol Beverage Control and Management	X				2
Select one course from the following:		X				3
CO 300	Writing Arguments (GT-CO3)			2		
CO 301B	Writing in the Disciplines: Sciences (GT-CO3)			2		
CO 301C	Writing in the Disciplines: Social Sciences (GT-CO3)			2		
JTC 300	Strategic Writing and Communication (GT-CO3)			2		
Total Credits						15
Semester 6		Critical	Recommended	AUCC		Credits
FTEC 360	Brewing Processes	X		4A		4
MIP 334	Food Microbiology	X				3
Select one course from the following:		X				3
STAT 201	General Statistics (GT-MA1)			1B		
STAT 204	Statistics With Business Applications (GT-MA1)			1B		
Elective (See list on Program Requirements tab)			X			3
Total Credits						13
Senior						
Semester 7		Critical	Recommended	AUCC		Credits
FTEC 422	Brewing Science I	X				5
FTEC 465	Food Production Operations	X				3
FTEC 492	Senior Seminar Fermentation and Food Science	X		4C		2

Elective (See list on Program Requirements tab)			X		6
Total Credits					16
Semester 8		Critical	Recommended	AUCC	Credits
FTEC 400	Food Safety	X			3
FTEC 430	Sensory Evaluation of Food Products	X			2
FTEC 460	Brewing Science II	X			5
FTEC 492	Senior Seminar Fermentation and Food Science	X		4C	2
Electives (See list on Program Requirements tab)			X		5-8
The benchmark courses for the 8th semester are the remaining courses in the entire program of study		X			
Total Credits					17-20
Program Total Credits:					120