

FOOD SCIENCE, B.SC.

Overview/Entrance Requirements

The B.Sc. Food Science provides the academic foundation of knowledge and skills for the wide range of opportunities in food science and technology. The degree program is structured in course offerings and content to enhance the competence of graduating students by providing greater emphasis in communications, critical thinking, computer literacy and statistics which are basic requirements of a modern professional environment. The B.Sc. Food Science (Science Option) program is accredited by the Institute of Food Technologists (IFT). (<https://www.ift.org/>)

The B.Sc. Food Science degree program offers two options: a Science Option and a Business Option. Students will select one of the two options of study. Both options require students to complete the Food Science Degree Core courses.

Degree Requirements

Course	Title	Hours
B.Sc. Food Science Degree Core		
ABIZ 1000	Introduction to Agribusiness Management	3
AGRI 1600	Introduction to Agrifood Systems	3
AGRI 2030	Technical Communications	3
AGRI 2400	Experimental Methods in Agricultural and Food Sciences ¹	3
BIOL 1020	Biology 1: Principles and Themes	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics	3
CHEM 1130	Introduction to Organic Chemistry ²	3
or CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties	
CHEM/MBIO 2730	Elements of Biochemistry 1 ³	3
CHEM 2740	Introduction to the Biochemistry Laboratory ³	3
ECON 1010	Introduction to Microeconomic Principles	3
FOOD 2500	Food Chemistry	3
FOOD 3010	Food Process 1	3
FOOD 4100	Current Issues in Food and Human Nutrition	3
FOOD 4150	Food Microbiology 1	3
FOOD 4160	Food Analysis 1	3
FOOD 4200	Quality Control in Foods	3
FOOD 4510	Food Product Development	3
HNSC 1200	Food: Facts and Fallacies	3
HNSC 1210	Nutrition for Health and Changing Lifestyles	3
MATH 1210	Techniques of Classical and Linear Algebra ⁴	3
or MATH 1300	Vector Geometry and Linear Algebra	
One of the following: ⁵		3
MATH 1500	Introduction to Calculus	
MATH 1510	Applied Calculus 1	
MATH 1524	Mathematics for Management and Social Sciences	

Free Electives

24 credit hours⁶ 24

Options

One of the following options: 30

Business Option Core

Science Option Core

Total Hours 120

- STAT 2000 (Basic Statistical Analysis 2) can be substituted for AGRI 2400 (Experimental Methods in Agricultural and Food Sciences).
- Students can hold CHEM 2100 (Organic Chemistry 1: Foundations of Organic Chemistry) in place of CHEM 1130 (Introduction to Organic Chemistry).
- Under required courses, students can use either CHEM 2700/MBIO 2700 (Biochemistry 1: Biomolecules and an Introduction to Metabolic Energy) in place of CHEM 2730/MBIO 2730 (Elements of Biochemistry 1) and may use CHEM 2720 (Principles and Practices of the Modern Biochemistry Laboratory) in place of CHEM 2740 (Introduction to the Biochemistry Laboratory).
- Students are recommended to take one of MATH 1210 or MATH 1300 however may also substitute MATH 1220 to meet the requirement.
- Students are recommended to take one of MATH 1500 or MATH 1510 or MATH 1524 however may also substitute MATH 1230 to meet the requirement. Students may use the former MATH 1520 to meet the MATH course requirement.
- Students can apply for the Cooperative Education Program. Two work terms are required to graduate with Co-op designation. Co-op courses (3 credit hours each) are used towards free electives.

Program Progression

Suggested Food Science (Science Option) Program Progression

Course	Title	Hours
Year 1		
AGRI 1600	Introduction to Agrifood Systems	3
BIOL 1020	Biology 1: Principles and Themes	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties	3
or CHEM 1130	or Introduction to Organic Chemistry	
ECON 1010	Introduction to Microeconomic Principles	3
HNSC 1200	Food: Facts and Fallacies	3
HNSC 1210	Nutrition for Health and Changing Lifestyles	3
MATH 1210	Techniques of Classical and Linear Algebra	3
or MATH 1300	or Vector Geometry and Linear Algebra	
One of the following:		3
MATH 1500	Introduction to Calculus	
MATH 1510	Applied Calculus 1	

MATH 1520		Hours	30
Year 2			
ABIZ 1000	Introduction to Agribusiness Management	3	
AGRI 2030	Technical Communications	3	
AGRI 2400	Experimental Methods in Agricultural and Food Sciences	3	
CHEM 1110 or CHEM 1130	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties or Introduction to Organic Chemistry	3	
CHEM/MBIO 2730	Elements of Biochemistry 1	3	
CHEM 2740	Introduction to the Biochemistry Laboratory	3	
FOOD 2500	Food Chemistry	3	
MBIO 1010	Microbiology I	3	
Free Electives/Co-op		6	
		Hours	30
Year 3			
BIOE 3530	Engineering Fundamentals	3	
FOOD 3010	Food Process 1	3	
FOOD 3210	Food Engineering Fundamentals	3	
FOOD 4150	Food Microbiology 1	3	
FOOD 4160	Food Analysis 1	3	
FOOD 4250	Food Analysis 2	3	
MKT 2210	Fundamentals of Marketing	3	
Restricted Electives		6	
Free Electives/Co-op		3	
		Hours	30
Year 4			
FOOD 4010	Food Process 2	3	
FOOD 4100	Current Issues in Food and Human Nutrition	3	
FOOD 4200	Quality Control in Foods	3	
FOOD 4510	Food Product Development	3	
Restricted Elective		3	
Free Electives/Co-op		15	
		Hours	30
Total Hours			120

While both CHEM 1110 and CHEM 1130 are required for the Food Science-Science Option program, normally only one is taken at a time.

Suggested Food Science (Business Option) Program Progression

Course	Title	Hours
Year 1		
AGRI 1600	Introduction to Agrifood Systems	3
BIOL 1020	Biology 1: Principles and Themes	3
BIOL 1030	Biology 2: Biological Diversity, Function and Interactions	3
CHEM 1100	Introductory Chemistry 1: Atomic and Molecular Structure and Energetics	3

CHEM 1110 or CHEM 1130	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties or Introduction to Organic Chemistry	3
ECON 1010	Introduction to Microeconomic Principles	3
ECON 1020	Introduction to Macroeconomic Principles	3
HNSC 1200	Food: Facts and Fallacies	3
MATH 1210 or MATH 1300	Techniques of Classical and Linear Algebra or Vector Geometry and Linear Algebra	3
One of the following:		3
MATH 1500	Introduction to Calculus	
MATH 1510	Applied Calculus 1	
MATH 1520		
		Hours
		30
Year 2		
ABIZ 1000	Introduction to Agribusiness Management	3
ACC 1100	Introductory Financial Accounting	3
AGRI 2030	Technical Communications	3
AGRI 2400	Experimental Methods in Agricultural and Food Sciences	3
CHEM/MBIO 2730	Elements of Biochemistry 1	3
CHEM 2740	Introduction to the Biochemistry Laboratory	3
FOOD 2500	Food Chemistry	3
HNSC 1210	Nutrition for Health and Changing Lifestyles	3
HRIR 2440	Human Resource Management	3
Free Electives/Co-op		3
		Hours
		30
Year 3		
ABIZ 2510	Introduction to Agricultural and Food Marketing	3
ECON 2010	Microeconomic Theory 1	3
ECON 2020	Macroeconomic Theory 1	3
FOOD 3010	Food Process 1	3
FOOD 4150	Food Microbiology 1	3
FOOD 4160	Food Analysis 1	3
FOOD 4500	Food Safety and Regulations	3
MKT 2210	Fundamentals of Marketing	3
Free Elective/Co-op		6
		Hours
		30
Year 4		
ABIZ 3510	Economics of Food Policy	3
FOOD 4100	Current Issues in Food and Human Nutrition	3
FOOD 4200	Quality Control in Foods	3
FOOD 4510	Food Product Development	3
Restricted Elective		3
Free Electives/Co-op		15
		Hours
		30
Total Hours		120

Concentrations

Science Option

The principal areas covered are food processing, chemistry, analysis and safety.

In addition to the courses required for the Food Science Degree Core the following courses are prescribed for the program leading to a B.Sc. in Food Science – Science Option.

Course	Title	Hours
Science Option Core		
BIOE 3530	Engineering Fundamentals	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties ¹	3
or CHEM 1130	Introduction to Organic Chemistry	
FOOD 3210	Food Engineering Fundamentals	3
FOOD 4010	Food Process 2	3
FOOD 4250	Food Analysis 2	3
MBIO 1010	Microbiology I ²	3
MKT 2210	Fundamentals of Marketing	3
Restricted Electives		
Group 1 - Food Safety:		
One of the following:		
FOOD 1000	Food Safety Today and Tomorrow	
FOOD 4310	Introduction to HACCP	
FOOD 4500	Food Safety and Regulations	
Group 2 - General:		
Two of the following:		
FOOD 3160	Frozen Dairy Products	
FOOD 3170	Cheese and Fermented Milk Products	
FOOD 3220	Grains for Food and Beverage	
FOOD 3500	Processing of Animal Food Products	
FOOD 4230	Food Research	
FOOD 4260	Water Management in Food Processing	
FOOD 4540	Functional Foods and Nutraceuticals	
HNSC 4270	Sensory Evaluation of Food	
Total Hours		30

¹ Both CHEM 1110 and CHEM 1130 are required for the Food Science – Science Option program. One of these courses will be credited as part of the Degree Core.

² Students who already have credit for MBIO 1220 before entering the program can use it towards MBIO 1010.

Business Option

The Business option provides students specialization in the areas of economics, finance, marketing and management.

In addition to the courses required for the Food Science Degree Core the following courses are prescribed for the program leading to a B.Sc. in Food Science – Business Option.

Course	Title	Hours
Business Option Core		
ABIZ 3510	Economics of Food Policy	3

ACC 1100	Introductory Financial Accounting	3
ECON 1020	Introduction to Macroeconomic Principles	3
ECON 2010	Microeconomic Theory 1	3
ECON 2020	Macroeconomic Theory 1	3
FOOD 4500	Food Safety and Regulations	3
HRIR 2440	Human Resource Management	3
or ABIZ 2620	Agricultural Human Resource Management	

Restricted Electives

Group 1 - Marketing:		
ABIZ 2510	Introduction to Agricultural and Food Marketing	3
MKT 2210	Fundamentals of Marketing	3
Group 2 - General:		
One of the following:		
FOOD 1000	Food Safety Today and Tomorrow	
FOOD 3160	Frozen Dairy Products	
FOOD 3170	Cheese and Fermented Milk Products	
FOOD 3220	Grains for Food and Beverage	
FOOD 3500	Processing of Animal Food Products	
FOOD 4250	Food Analysis 2	
FOOD 4260	Water Management in Food Processing	
FOOD 4310	Introduction to HACCP	
FOOD 4540	Functional Foods and Nutraceuticals	

Total Hours **30**

Cooperative Education Program

Co-operative Education is a process that alternates periods of academic study with periods of paid work experience relating to the co-op student's area of study. Through the Co-operative Education Program, full-time, paid work terms provide the students with practical experience and provide guidance for further career specialization or further academic study.

Students secure full-time, paid co-op work placements with a faculty-approved employer(s) that are each a minimum of 420 hours, to be completed within 4 months. The faculty supports students on both a group and individual basis to determine their learning goals for the work placement. Students are expected to attend an orientation session as well as participate in a series of self-evaluations under the guidance of a sessional instructor. Prior to starting each work term, students will register in AGRI 2002 (first placement), AGRI 3002 (2nd placement), and AGRI 4002 (3rd placement) within the term that their co-op placement will take place and pay the fees. Students must submit a reflective written report at the end of the work term and are evaluated for both overall participation and the report on a Pass/Fail basis.

Degree Program

Admission: Students who have been admitted to an undergraduate program within the faculty are eligible to apply to the Co-operative Education Program. Students are advised that satisfying the entrance requirements does not guarantee a place in the Co-operative Education Program. Full admission into the Program is dependent upon a student's ability to secure a work term placement. Normally, the first work term would take place at the end of the second academic year allowing students to pursue professional development activities in year one. However, with approval of the Faculty and employer, the first work term could commence after the first year of a four-year or second-degree

program. Students admitted into the Program must maintain good academic standing (minimum DGPA of 2.0).

Employment Term Requirements: The Co-operative Education Program requires the student to secure two full-time, paid co-op work terms (minimum of 420 hours each) with a faculty approved employer(s). A third work term is optional. Prior to starting the work term, students are required to register in the appropriate Agricultural and Food Sciences Co-operative Education Work Term Course within the set deadlines and pay the fee. Successful completion of a work term includes participating in a mid-work term interview with the Co-op Coordinator and completion of a written work term report at the end of each work term. Students who receive a passing grade on the work term reports for all required work terms graduate with the Co-operative Education designation acknowledged on their parchment.

During a work term, a co-op student may take a maximum of one additional course worth up to six credit hours for a total of nine (9) credit hours. Co-op credit hours earned can be used towards free elective requirements in any degree program.

Diploma Program

Admission: To be considered for admission in the Cooperative Education Program, a first year diploma student must have a minimum Degree GPA of 2.0, and have completed at least 24 credit hours of studies by the end of the academic year of application.

Students are advised that satisfying the entrance requirements does not guarantee a place in the Cooperative Education Program. Full admission into the program is dependent upon the student receiving a job placement through the Cooperative Education Office.

Employment Term Requirements: The student will receive three credits for completing the Cooperative Education Program. Students are required to register in the employment term course and pay the fee prior to starting the employment term.