BS in Food Science and Nutrition

Degree Program Description

From creating low-fat ice cream flavors that don't taste low-fat, to developing packaging that protects food from E. coli and other pathogens, food scientists work to ensure the foods that fill your shopping cart are safe, nutritious and delicious. Food Science and Nutrition uses the latest in food manufacturing to turn agricultural commodities into products that consumers want to buy. A degree in food science and nutrition provides the skills needed to succeed in a variety of food science careers. The degree can be individualized by choosing between two degree tracks: Food Science and Food Business. Some careers include Food technologist, product developers and quality assurance supervisors. Food technologists are employed by some of the world's largest and most respected private industry companies, including Del Monte Foods, General Mills, H.J. Heinz and Kellogg. They apply the principles of many scientific disciplines, such as biology, chemistry, engineering, physics, molecular biology, nutrition and microbiology to the challenges of food production. Product developers find employment with many of the same companies as food technologists. Their job, however, focuses more on other aspects of food manufacturing such as consumer acceptability, economics, production feasibility and marketing. Developers also explore new ways to enhance nutritional value and health benefits. Quality assurance supervisors work in private industry but also are employed by government agencies such as the U.S. Department of Agriculture and the Food and Drug Administration. They are responsible for reviewing safety and manufacturing protocol to ensure that the food you eat is safe and of the highest quality. The Food Science track is highly science-based and can be adapted for students seeking to enter a professional degree program such as Medicine, Veterinary, Dental or similar program as well as a step towards an M.S. or Ph.D. in Food Science or a related field.

Major Program Requirements

Students earning a Bachelor of Science in Food Science and Nutrition are required to complete all University general education (http://catalog.missouri.edu/academicdegreerequirements/generaleducationrequirements/), University graduation (http://catalog.missouri.edu/academicdegreerequirements/universityrequirements/), and degree requirements, including foundational courses, which may fulfill some University general education requirements.

If you are planning to transfer courses (including AP credit) and would like to information on how they apply to a degree program(s), you can email CAFNRadvising@missouri.edu for general recommendations.

Foundational Courses		
MATH 1100	College Algebra	3
CHEM 1400 & CHEM 1401	College Chemistry I and College Chemistry I Laboratory	4
BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
ABM 1041	Applied Microeconomics	3
or ECONOM 1014	Principles of Microeconomics	
AGSC_COM 2220	Verbal Communication in Agriculture, Food and Natural Resources	3
or AGSC_COM 2220H	Verbal Communication in Agriculture, Food and Natural Resources - Honors	
or COMMUN 1200	Public Speaking	
ABM 3241W	Ethical Issues in Agriculture - Writing Intensive	3
or PHIL 2400	Ethics and the Professions	
or PHIL 2420	Ethical Issues in Business	
or PHIL 2440	Medical Ethics	
or PHIL 2600	Rational Decisions	
or PHIL 2900	Environmental Ethics	
ABM or Business course at the 2000-level or higher (choose course from list below)		3
ABM 2070W	Environmental Economics and Policy - Writing Intensive	3
ABM 3223	Relationship Selling: Creating Value for Customers	3
ABM 3256	Agribusiness and Biotechnology Law	3
ACCTCY 2010	Introduction to Accounting	3
ECONOM 3224	Introduction to International Economics	3
ECONOM 3251	Managerial Economics	3
FINPLN 2183	Personal and Family Finance	3
MRKTNG 3000	Principles of Marketing	3
MRKTNG 4220	Consumer Behavior	3
Core Degree Requirements		
F_S 1030	Food Science and Nutrition	3
F_S 2172	Elements of Food Microbiology	3
F_S 2199	Seminar in Professional Development	1
F_S 4199	Food Industry Senior Seminar	1
F_S 4310	Food Chemistry and Analysis	4
F_S 4370	Food Microbiology	3
F_S 4980	Food Quality Assurance	3
AG_S_TCH 1040	Physical Principles for Agricultural Applications	3
or PHYSCS 1210	College Physics I	
CHEM 1410 & CHEM 1411	College Chemistry II and College Chemistry II Laboratory	4
CHEM 2030	Survey of Organic Chemistry	3
CHEM 2130	Organic Laboratory I	2
BIOCHM 3630	General Biochemistry	3
MATH 1400	Calculus for Social and Life Sciences I	3-5
or MATH 1500	Analytic Geometry and Calculus I	
ABM 2123	Quantitative Applications in Agricultural and Natural Resource Sciences	3
or ABM 2225	Statistical Analysis	
or STAT 1200	Introductory Statistical Reasoning	
EXPERIENTIAL LEARNING		
AFNR 2191	International Agriculture, Food and Natural Resources - Humanities	3
or AFNR 2190	International Agriculture, Food and Natural Resources	
or F_S 4941	Internship in Food Science	
CAPSTONE		
F_S 4970W	Food Product Development - Writing Intensive	3

Food Science Track

(Note: Tracks are not listed on transcripts or diplomas.)

Food Science Track Core Courses (30 credits required)		
NEP 2340	Human Nutrition I	3
F_S 4330	Principles of Food Processing	3
or F_S 4160	Food Process Engineering	
F_S 4311	Investigation of Food Properties	3
F_S 4315W	Food Chemistry and Analysis Laboratory - Writing Intensive	3
F_S 4375	Food Microbiology Laboratory	2
F_S 4380	Sensory Analysis of Food and Beverages	3
Commodity Block		
Choose two selections from the Commodity Block		12
Professional Electives		
Choose courses from the Professional Electives		3

Food Business Track

(Note: Tracks are not listed on transcripts or diplomas.)

Food Business Track Core Courses (30 credits required)		
Business Courses		
ABM 1042	Applied Macroeconomics	3
or ECONOM 1015	Principles of Macroeconomics	
ACCTCY 2036	Accounting I	3
ACCTCY 2037	Accounting II	3
ABM 3224	New Products Marketing	3
ABM 3260	General Farm Management	3
ABM 3256	Agribusiness and Biotechnology Law	3
FINANC 2000	Survey of Business Finance	3
Ag Business Elective (choose one)		**3**
ABM 3183	The Economics of the Food, Fiber and Fuel Supply Chain	3
ABM 3223	Relationship Selling: Creating Value for Customers	3
ABM 3230	Agricultural and Rural Economic Policy	3
ABM 3150	International Agribusiness	3
ABM 3271	International Agricultural Development	3
ABM 3272	International Food Trade and Policy	3
ABM 3286	Economics of Managerial Decision Making	3
ABM 3294	Agricultural Marketing and Procurement	3
Commodity Course		
Choose one of the following		3
F_S 4331	Technology of Dairy Products and Ingredients	3
F_S 4344	Processing Muscle Foods	3
F_S 4345	Principles of Viticulture and Winemaking	3
Professional Electives		
Choose courses from the list of Professional Electives		6

Commodity Blocks

Select two pairs of courses to fulfill science track requirements.

F_S 3214 & F_S 4344	Principles of Meat Science and Processing Muscle Foods	6
F_S 3231 & F_S 4331	Principles of Dairy Foods Science and Technology of Dairy Products and Ingredients	6
F_S 2195 & F_S 4345	Grapes and Wines of the World and Principles of Viticulture and Winemaking	6

Professional Electives

Select courses from this list to fulfill specific track requirements.

F_S 1020	World Food and You	3
F_S 2131	Dairy Products Evaluation	2
F_S 3210	Kitchen Chemistry	3
F_S 3385	Problems in Food Science	1-3
F_S 4301	Topics in Food Science	1-3
F_S 4354	Physiology and Biochemistry of Muscle as Food	3
F_S 4385	Problems in Food Science	1-3
F_S 4390	Optimization and Management of Food and Agricultural Systems	3

Electives

Electives to fulfill 120 credits with the following as suggested courses:

PSYCH 1000	General Psychology	3
SOCIOL 1000	Introduction to Sociology	3
GEOG 1600	Climate Change: Science and Public Policy	3

Accelerated BS to MS in Food and Hospitality Systems

The accelerated BS to MS in Food and Hospitality Systems allows students to complete a bachelors and masters degree within five years. Students will need to select the Food Science and Nutrition track in the MS in Food and Hospitality Systems. Eligible students will need to complete at least 90 credit hours, (including all general education and academic course requirements), with a cumulative GPA of 3.2 or higher (3.5 or higher in FSN-required courses). Each student will be accepted by at least one graduate faculty advisor who will advise and mentor the student from when they are a Provisional Graduate Student (year 1) until completion of the MS program. Once students complete 120 credit hours, they will be conferred the BS degree.

Students accepted to the program may enroll in 12-15 credit hours of graduate level courses, (7000 or 8000 level), during their Provisional Graduate year that will count towards both their BS and MS degrees as shared credits. 18 credit hours of graduate credit will be completed during their Graduate Student year (year2) for a total of 30-33 graduate credit hours. At least 15 credit hours must be at the 8000 level or higher.

Total credits required for graduation must be at least 138 total credit hours.

- Total undergraduate credits: 120
- Total dual credits: 12-15
- Total graduate credits: 30

First Year (as Provisional Graduate Student)		**12-15**
7000 level courses [1]		12-15
Second Year (as Graduate Student)		**15-18**
STAT 7070	Statistical Methods for Research	3

F_S 8402	Research Methods in Food Science	2
F_S 8087	Seminar in Food Science	1
F_S 8090	Research in Food Science	6
or AG_S_TCH 8090	Thesis Research in Agricultural Systems Technology	
8000 level courses [1]		6

[1] According to course options of each track.

Requirements for Thesis/Non-Thesis

Students may choose the thesis or non-thesis option. Students must take at least 6 credit hours of research credit (F_S 8090 or AG_S_TCH 8090) for either option.

Thesis Option: Students conduct independent research on a topic approved by the students advisor and graduate committee. Students present and defend their theses, and complete a manuscript on their research that is suitable for publication at the end of their program.

Non-Thesis Option: Students conduct independent research on a topic approved by the students advisor and graduate committee. Students present their research and write a technical report on their research at the end of their program.

Semester Plan

Below is a sample plan of study for the Food Science Track, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year					
Fall	**CR**	**Spring**	**CR**		
F_S 1030	3	ENGLSH 1000	3		
MATH 1100	3	CHEM 1400 & CHEM 1401	4		
MO STATE LAW	3	BIO_SC 1500	5		
AGSC_COM 2220 or COMMUN 1200	3	F_S 2199	1		
	12		**13**		
Second Year					
Fall	**CR**	**Spring**	**CR**		
CHEM 1410 & CHEM 1411	4	F_S 2172	3		
MATH 1400 or 1500	3	AG_S_TCH 1040	3		
ABM 1041	3	ABM 2225 or STAT 1200	3		
PHIL/ABM Ethics Course	3	Food Science Commodity Course	3		
Humanities Elective	3	General Elective Writing Intensive	3		
	16		**15**		
Third Year					
Fall	**CR**	**Spring**	**CR**	**Summer**	**CR**
CHEM 2030	3	BIOCHM 3630	3	F_S 4941 or AFNR 2191	1-6
CHEM 2130	2	NEP 2340	3		
F_S 4330	3	Food Science Commodity Course	3		
Food Science Commodity Course	3	Food Science Professional Elective	3		
ABM 2000+ Social/ Behavior Course	3	General Elective	3		
	14		**15**		**1-6**
Fourth Year					
Fall	**CR**	**Spring**	**CR**		
F_S 4310	4	F_S 4199	1		
F_S 4370	3	F_S 4311	3		
F_S 4375	2	F_S 4315W	3		
F_S 4970W	3	F_S 4380	3		
Food Science Commodity Course	3	F_S 4980	3		
		General Elective	3		
	15		**16**		

Total Credits: 117-122