

# BS in FOOD SCIENCE (284320) MAP Sheet

## Department of Nutrition, Dietetics, and Food Science

For students entering the degree program during the 2016–2017 curricular year.

Food science is the multidisciplinary study of food, utilizing biology, chemistry, nutrition, engineering, and other sciences.



UNIVERSITY CORE AND GRADUATION REQUIREMENTS				PROGRAM REQUIREMENTS (66-68 total hours)			
UNIVERSITY CORE REQUIREMENTS				Consult with a faculty advisor prior to finalizing your curriculum plan.			
<u>Requirements</u>	<u>#Classes</u>	<u>Hours</u>	<u>Classes</u>	<b>Complete the following core requirements:</b>		NDFS 399R Academic Internship	9.0V
<b>Religion Cornerstones</b>				Chem 105* General College Chemistry	4.0	(1 hour minimum required)	
Teachings & Doctrine, Book of Mormon	1	2.0	Rel A 275	MMBio 221* General Microbiology	3.0	Org B 320 Organizational Effectiveness	3.0
Jesus Christ & the Everlasting Gospel	1	2.0	Rel A 250	MMBio 222 General Microbiology Lab	1.0	Complete one course from the following guest lecture series:	
Foundations of the Restoration	1	2.0	Rel C 225	NDFS 100 Essentials of Human Nutrition	3.0	Bus M 371R Entrepreneurship Lecture Series	1.0
The Eternal Family	1	2.0	Rel C 200	NDFS 191 Careers in Food Science	1.0	Bus M 380 Executive Lectures	1.0
<b>The Individual and Society</b>				NDFS 250 Essentials of Food Science	3.0	Bus M 382 Financial Services Lecture Series	1.0
Citizenship				NDFS 251 Essentials of Food Sci Lab	1.0	Complete one of the following major electives:	
American Heritage	1–2	3–6.0	from approved list	NDFS 350 Food Analysis	4.0	Bus M 372 Basic Entrepreneurship Skills	3.0
Global & Cultural Awareness	1	3.0	from approved list	NDFS 355 Food Process Engineering	4.0	NDFS 200 Nutrient Metabolism	3.0
<b>Skills</b>				NDFS 361 Food Microbiology	3.0	NDFS 450 Food Chemistry	3.0
Effective Communication				NDFS 362 Food Commodity Processing	3.0	NDFS 465 Food Product Development	3.0
First-Year Writing	1	3.0	from approved list	NDFS 462 Food Regs & Quality Assurance	3.0	During the junior year or upon declaring food science as a major, students are strongly encouraged to select one of the following options to enhance career preparation (Food Industry Management track MUST take one credit of NDFS 399R to graduate):	
Adv Written & Oral Communication	1	3.0	Engl 316 recommended	Phscs 105* General Physics 1	3.0	A. Choose a research topic and faculty mentor. Working in a research laboratory for 10–20 hours per week over the course of eight months, the student has daily contact with graduate students, technicians, and fellow undergraduate colleagues and frequent interactions with a faculty mentor. Student research often leads to participation in a publication and/or a presentation at a professional meeting. NDFS 494R credit is available.	
Quantitative Reasoning	0–1	0–3.0	Stat 121	Stat 121* Principles of Statistics	3.0	B. Produce a senior thesis in collaboration with a faculty mentor, derived primarily from library study that extensively explores the relevant questions. The thesis is written in the format of a scientific review paper. NDFS 494R credit is available.	
Languages of Learning (Math or Language)	1	4.0	Math 112* or 119*	<b>Complete one of the following tracks:</b>		C. Work in an approved, faculty-supervised summer internship with a food company (generally the internship does not include study abroad). NDFS 399R credit is available.	
<b>Arts, Letters, and Sciences</b>				<b>a. Food Science Technical Track:</b>		<b>(continued on back of this page)</b>	
Civilization 1 and 2	2	6.0	Tech 201, 202 recommended	Complete the following:			
Arts	1	3.0	from approved list	Chem 106 General College Chemistry	3.0		
Letters	1	3.0	from approved list	Chem 107 General College Chemistry Lab	1.0		
Scientific Principles & Reasoning				Chem 351 Organic Chemistry 1	3.0		
Biological Science	1	3.0	MMBio 221*	Chem 352 Organic Chemistry 2	3.0		
Physical Science	2	7.0	Chem 105*, Phscs 105*	Chem 353 Organic Chemistry Lab	2.0V		
Social Science	1	3.0	Econ 110 recommended	(1 hour required)			
<b>Core Enrichment: Electives</b>				Chem 481 Biochemistry	3.0		
Religion Electives	3–4	6.0	from approved list	NDFS 450 Food Chemistry	3.0		
Open Electives	Variable	Variable	personal choice	NDFS 464 Food Sensory Evaluation	2.0		
				NDFS 465 Food Product Development	3.0		
				Phscs 106 General Physics 2	3.0		
<b>GRADUATION REQUIREMENTS:</b>				Complete one course from the following:			
Minimum residence hours required		30.0		Math 112* Calculus 1	4.0		
Minimum hours needed to graduate		120.0		Math 119* Introduction to Calculus	4.0		
				<b>b. Food Industry Management Track</b>			
				Complete the following:			
				Acc 200 Principles of Accounting	3.0		
				Bus M 488 Agribusiness Management 1	3.0		
				Bus M 489 Agribusiness Management 2	3.0		
				Chem 285 Intro Bio-organic Chemistry	4.0		
				Econ 110* Econ Principles & Problems	3.0		
				Fin 201 Principles of Finance	3.0		
				<b>(continued in next column)</b>			

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### Recommended Courses:

Consult with a faculty advisor before selecting:

#### Food Science Technical Track:

Chem	223	Quantitative & Qualitative Analysis	4.0
Econ	110	Econ Principles and Problems	3.0
Engl	316	Technical Communication	3.0
IAS	220	Intro to Development Studies	3.0
Mfg	355	Plastics Materials and Processing	3.0
NDFS	200	Nutrient Metabolism	3.0
Phscs	107	General Physics Lab 1	1.0
Phscs	108	General Physics Lab 2	1.0
PWS	100	Plants in the Environment	3.0
StDev	150	Public Speaking	3.0
StDev	317R	Career Strategies	2.0
Tech	201	Hist of Creativity in the Arts, Sci, And Technology 1	3.0
Tech	202	Hist of Creativity in the Arts, Sci, and Technology 2	3.0

#### Food Industry Management Track:

Engl	316	Technical Communication	3.0
<b>or</b>			
M Com	320	Communication in Organizational Settings	3.0
IAS	220	Intro to Development Studies	3.0
Math	119	Introduction to Calculus	4.0
Mfg	479	Innovation & Entrepreneurship	3.0
NDFS	200	Nutrient Metabolism	3.0
NDFS	450	Food Chemistry	3.0
NDFS	464	Food Sensory Evaluation	1.0
Phscs	106	General Physics 2	3.0
PWS	100	Plants in the Environment	3.0
StDev	150	Public Speaking	3.0
StDev	317R	Career Strategies	2.0V
Tech	201	Hist of Creativity in the Arts, Sci, And Technology 1	3.0
Tech	202	Hist of Creativity in the Arts, Sci, and Technology 2	3.0

### Suggested Sequence of Courses:

#### Food Science Technical Track

#### FRESHMAN YEAR

##### 1st Semester

Chem	105 (FWSpSu)	4.0
First-Year Writing or A Htg	100	3.0
Math	112 or 119	4.0
NDFS	191 (FW)	1.0
Religion	Cornerstone course	2.0
General	elective	2.0
<b>Total Hours</b>		<b>16.0</b>

#### 2nd Semester

First-Year Writing or A Htg	100	3.0
Chem	106, 107 (FWSpSu)	4.0
NDFS	100 (FWSu)	3.0
Phscs	105 (FWSp)	3.0
Religion	Cornerstone course	2.0
<b>Total Hours</b>		<b>15.0</b>

#### SOPHOMORE YEAR

##### 3rd Semester

Chem	351 (FWSp)	3.0
NDFS	250 (FWSp)	3.0
NDFS	251 (FWSp)	1.0
Phscs	106 (FWSu)	3.0
Religion	Cornerstone course	2.0
General	Elective	2.0
<b>Total Hours</b>		<b>14.0</b>

##### 4th Semester

Chem	352 (FWSpSu)	3.0
Chem	353 (FWSpSu)	1.0
MMBio	221 (FWSpSu) (Biological Science)	3.0
MMBio	222 (FWSpSu)	1.0
Religion	Cornerstone course	2.0
Stat	121 (Languages of Learning)	3.0
General	Elective	2.0
<b>Total Hours</b>		<b>15.0</b>

#### JUNIOR YEAR

##### 5th Semester

Arts or Letters	elective	3.0
Engl	316 (FWSpSu) (Adv. Writing)	3.0
NDFS	361 (F)	3.0
NDFS	362 (F)	3.0
Religion	elective (FWSpSu)	2.0
General	elective	1.0
<b>Total Hours</b>		<b>15.0</b>

##### 6th Semester

NDFS	350 (W)	4.0
NDFS	355 (W)	4.0
Stat	121	3.0
Religion	elective	2.0
General	elective	1.0
<b>Total Hours</b>		<b>14.0</b>

#### SENIOR YEAR

##### 7th Semester

Chem	481 (FWSpSu)	3.0
NDFS	450 (F)	3.0
NDFS	462 (F)	3.0
Civilization	1 elective	3.0
Arts or Letters	elective	3.0
<b>Total Hours</b>		<b>15.0</b>

##### 8th Semester

NDFS	464 (W)	2.0
NDFS	465 (W)	3.0
Social Science	elective	3.0
Religion	elective (FWSpSu)	2.0
Civilization	2 elective	3.0
Global & Cultural Awareness	elective	3.0
<b>Total Hours</b>		<b>16.0</b>

#### Food Industry Management Track

#### FRESHMAN YEAR

##### 1st Semester

Chem	105 (FWSpSu)	4.0
First-Year Writing or A Htg	100	3.0
Econ	110 (FWSpSu) (Social Science)	3.0
Quantitative Reasoning	(If needed)	0–3.0
NDFS	191 (FW)	1.0
Religion	Cornerstone course	2.0
<b>Total Hours</b>		<b>13–16.0</b>

##### 2nd Semester

First-Year Writing or A Htg	100	3.0
Chem	285 (FWSpSu)	4.0
NDFS	100 (FWSu)	3.0
Religion	Cornerstone course	2.0
General	elective	3.0
<b>Total Hours</b>		<b>15.0</b>

#### SOPHOMORE YEAR

##### 3rd Semester

Acc	200 (FWSpSu)	3.0
General or Major	elective	6.0
NDFS	250 (FWSp)	3.0
NDFS	251 (FWSp)	1.0
Religion	Cornerstone course	2.0
<b>Total Hours</b>		<b>15.0</b>

#### 4th Semester

MMBio	221 (FWSpSu) (Biological Science)	3.0
MMBio	222 (FWSpSu)	1.0
Phscs	105 (FWSp) (Physical Science)	3.0
Stat	121 (FWSpSu) (Languages of Learning)	3.0
Arts or Letters	elective	3.0
Religion	Cornerstone course	2.0
<b>Total Hours</b>		<b>15.0</b>

#### JUNIOR YEAR

##### 5th Semester

Fin	201 (FWSp)	3.0
Guest lecture series	elective	1.0
Adv. Written & Oral Communication	(Engl 316 recommended)	3.0
NDFS	361 (F)	3.0
NDFS	362 (F)	3.0
Religion	elective	2.0
<b>Total Hours</b>		<b>15.0</b>

##### 6th Semester

NDFS	350 (W)	4.0
NDFS	355 (W)	4.0
NDFS	399R (FWSpSu)	1.0
Org	B 320	3.0
Religion	elective	2.0
<b>Total Hours</b>		<b>14.0</b>

#### SENIOR YEAR

##### 7th Semester

Bus	M 488 (F)	3.0
NDFS	462 (F)	3.0
Arts or Letters	elective	3.0
Civilization	1 elective	3.0
Major	elective	3.0
<b>Total Hours</b>		<b>15.0</b>

##### 8th Semester

Bus	M 489 (W)	3.0
Civilization	2 elective	3.0
Global & Cultural Awareness	elective	3.0
Religion	elective	2.0
General or major	electives	3.0
<b>Total Hours</b>		<b>14.0</b>

**Note:** Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.

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## BS in FOOD SCIENCE (284320) 2016–2017

### THE DISCIPLINE:

Food Science is the multidisciplinary study of food and the application of knowledge thus gained to developing food products and processes, preserving and storing food, and assuring food safety and quality. Food science addresses the conversion of raw agricultural products into a nutritious, convenient, and economical food supply. Most of the food products available in grocery stores were developed, produced and tested by food scientists. Students graduating in Food Science are well prepared for immediate employment in the food industry. The technical track curriculum also provides excellent preparation as a premedical, pre dental or other preprofessional major. With one additional credit hour, students graduating in the technical track are able to obtain a minor in chemistry. Students pursuing the management track are eligible to apply for a business minor and are well prepared for graduate studies in a Master of Business Administration (MBA) program.

### PRACTICAL EXPERIENCE AND INTERNSHIPS:

Students can get hands-on experience working several semesters with faculty on research projects. Summer work opportunities are available with many food companies in numerous cities. The department has developed ongoing summer internships with several food companies.

### PROFESSIONAL ASSOCIATION:

BYU's food science technical track curriculum has been reviewed and approved by the Institute of Food Technologists (IFT), the professional society of food scientists.

### HONORARY SOCIETIES AND CLUBS:

Students and faculty interact in the various social, service and career-related activities of the Food Science Club. The Food Science Club is a student chapter of IFT and participates in the statewide IFT Bonneville Section, which helps students develop a network of professional contacts. Students may also participate in Food Science College Bowl and other student competitions sponsored by IFT.

### CAREERS:

Food Science provides excellent career prospects in the worldwide, multibillion dollar food industry. The food industry is consistently looking for graduates to fill all of the unique and challenging opportunities available. Potential careers include:

*Food research and development scientist*-Develops new food products according to market demand. Improves and modifies existing foods to meet current consumer wants. Participates in manufacturing scale-up and commercialization of lab prototypes.

*Food plant production manager*-Manages and supervises food processing plant. Uses technical and business skills to ensure economical production. Manages personnel and solves food production problems.

*Quality assurance director*-Generates specifications and supervises analyses of raw materials and ingredients. Monitors food processing and assures final product quality. Assures proper sanitation.

*Food Ingredient technical salesperson*-Contacts industrial customers or potential users of food ingredients. Provides technical insight and assistance. Extends the company's products among consuming companies.

*Basic research scientist*-Conducts basic and applied food research. Works in industry, academia, or government.

(See faculty advisor for additional career choices.)

### FINANCING:

Scholarships are available from the department, the college, and IFT. University and federal sources of scholarships and financing are also available. Many students work part time to help with finances. Research opportunities and summer work are available for most students. Work in the department as research or teaching assistants is available for some qualified students.