BS in FOOD SCIENCE (284320) MAP Sheet
Department of Nutrition, Dietetics, and Food Science
For students entering the degree program during the 2015–2016 curricular year.
Food science is the multidisciplinary study of food, utilizing biology, chemistry, nutrition, engineering, and other sciences.

<table>
<thead>
<tr>
<th>UNIVERSITY CORE AND GRADUATION REQUIREMENTS</th>
<th>PROGRAM REQUIREMENTS (65-68 total hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNIVERSITY CORE REQUIREMENTS</strong></td>
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<tr>
<td>Requirements</td>
<td>Classes</td>
</tr>
<tr>
<td>Religion Cornerstones</td>
<td></td>
</tr>
<tr>
<td>Teachings &amp; Doctrine, Book of Mormon</td>
<td>1</td>
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<tr>
<td>Jesus Christ &amp; the Everlasting Gospel</td>
<td>1</td>
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<tr>
<td>Foundations of the Restoration</td>
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<tr>
<td>The Eternal Family</td>
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<td><strong>The Individual and Society</strong></td>
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<tr>
<td>Citizenship</td>
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<tr>
<td>American Heritage</td>
<td>1–2</td>
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<tr>
<td>Global &amp; Cultural Awareness</td>
<td>1</td>
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<tr>
<td><strong>Skills</strong></td>
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<tr>
<td>Effective Communication</td>
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<tr>
<td>First-Year Writing</td>
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<tr>
<td>Adv Written &amp; Oral Communication</td>
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<tr>
<td>Quantitative Reasoning</td>
<td>0–1</td>
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<tr>
<td>Languages of Learning (Math or Language)</td>
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<tr>
<td><strong>Arts, Letters, and Sciences</strong></td>
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<tr>
<td>Civilization 1 and 2</td>
<td>2</td>
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<tr>
<td>Arts</td>
<td>1</td>
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<tr>
<td>Letters</td>
<td>1</td>
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<tr>
<td><strong>Scientific Principles &amp; Reasoning</strong></td>
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<tr>
<td>Biological Science</td>
<td>1</td>
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<tr>
<td>Physical Science</td>
<td>2</td>
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<tr>
<td>Social Science</td>
<td>1</td>
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<tr>
<td><strong>Core Enrichment: Electives</strong></td>
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<tr>
<td>Religion Electives</td>
<td>3–4</td>
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<tr>
<td>Open Electives</td>
<td>Variable</td>
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<td><strong>GRADUATION REQUIREMENTS:</strong></td>
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<td>Minimum residence hours required</td>
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<td>Minimum hours needed to graduate</td>
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Consult with a faculty advisor prior to finalizing your curriculum plan.

**Complete the following core requirements:**

- Chem 105* General College Chemistry 4.0
- MMBio 221* General Microbiology 3.0
- Chem 222 General Microbiology Lab 1.0
- NDFS 100 Essentials of Human Nutrition 3.0
- NDFS 250 Essentials of Food Science 3.0
- NDFS 251 Essentials of Food Sci Lab 1.0
- NDFS 350 Food Analysis 4.0
- NDFS 355 Food Process Engineering 4.0
- NDFS 361 Food Microbiology 3.0
- NDFS 362 Food Commodity Processing 3.0
- NDFS 462 Food Regulations & Quality Assurance 2.0
- Phscs 105* General Physics 1 3.0
- Stat 121* Principles of Statistics 3.0

**Complete one of the following tracks:**

**a. Food Science Technical Track:**

- Chem 106 General College Chemistry 3.0
- Chem 107 General College Chemistry Lab 1.0
- Chem 351 Organic Chemistry 3.0
- Chem 352 Organic Chemistry 3.0
- Chem 353 Organic Chemistry Lab 2.0V (1 hour required)
- Chem 481 Biochemistry 3.0
- NDFS 450 Food Chemistry 3.0
- NDFS 464 Food Sensory Evaluation 1.0
- NDFS 465 Food Product Development 3.0
- Phscs 106 General Physics 2 3.0
- SDev 150 Public Speaking 3.0

**Complete one course from the following:**

- Math 112* Calculus 1 4.0
- Math 119* Introduction to Calculus 4.0

**b. Food Industry Management Track**

- 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

(continued in next column)

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):

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.

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.

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.

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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 100** Nutrient Metabolism 3.0
- **NDFS 191** Careers in Food Science 1.0
- **Phsce 100** General Physics Lab 1 1.0
- **Phsce 101** General Physics Lab 2 1.0
- **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

**Total Hours**: 15.0

#### SOPHOMORE YEAR
- **Chem 351** (FWSp) 3.0
- **NDFS 200** (FWSp) 3.0
- **NDFS 250** (FWSp) 3.0
- **NDFS 251** (FWSp) 1.0
- **Religion Cornerstone course** 2.0

**Total Hours**: 15.0

#### JUNIOR YEAR
- **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

**Total Hours**: 15.0

#### SENIOR YEAR
- **MMBio 221** (FWSpSu) (Biological Science) 3.0
- **NDFS 464** (W) 1.0
- **NDFS 465** (W) 3.0
- **Religion elective (FWSpSu)** 2.0
- **Civilization 1 elective** 3.0
- **Arts or Letters elective** 3.0
- **Religion Cornerstone course** 2.0

**Total Hours**: 15.0

### Food Industry Management Track:

#### FRESHMAN YEAR
- **Chem 105** (FWSpSu) 4.0
- **First-Year Writing or A Htg 100** 3.0
- **NDFS 100** (FWSpSu) 3.0
- **Phsce 105** (FWSp) 3.0
- **Religion Cornerstone course** 2.0

**Total Hours**: 14.0

#### 2nd Semester
- **Chem 106, 107** (FWSpSu) 4.0
- **Quantitative Reasoning (if needed)** 3.0
- **NDFS 191** (FW) 1.0
- **Religion Cornerstone course** 2.0

**Total Hours**: 15.0

#### 3rd Semester
- **Chem 351** (FWSp) 3.0
- **Engl 316** Technical Communication 3.0
- **M Com 320** Communication in Organizational Settings 3.0
- **NDFS 250** (FWSp) 3.0
- **NDFS 251** (FWSp) 1.0

**Total Hours**: 15.0

#### 4th Semester
- **Chem 352** (FWSpSu) 3.0
- **M MBio 221** (FWSpSu) (Biological Science) 3.0
- **MMBio 222** (FWSpSu) 1.0
- **Religion Cornerstone course** 2.0
- **General elective** 3.0

**Total Hours**: 15.0

#### 5th Semester
- **MMBio 221** (FWSpSu) (Biological Science) 3.0
- **NDFS 464** (W) 1.0
- **NDFS 465** (W) 3.0
- **Religion elective** 2.0
- **Global & Cultural Awareness elective** 3.0

**Total Hours**: 15.0

#### 6th Semester
- **Bus M 201** (FWSp) 3.0
- **Guest lecture series elective** 1.0
- **Adv. Written & Oral Communication** 3.0

**Total Hours**: 15.0

### Suggested Sequence of Courses:

#### Food Science Technical Track

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
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<tbody>
<tr>
<td>1st Year</td>
<td>First-Year Writing or A Htg 100 3.0</td>
</tr>
<tr>
<td>2nd Year</td>
<td>Chem 106, 107 (FWSpSu) 4.0</td>
</tr>
<tr>
<td>3rd Year</td>
<td>NDFS 100 (FWSpSu) 3.0</td>
</tr>
<tr>
<td>4th Year</td>
<td>Phsce 105 (FWSp) 3.0</td>
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<tr>
<td>5th Year</td>
<td>Religion Cornerstone course 2.0</td>
</tr>
<tr>
<td>6th Year</td>
<td>Total Hours 15.0</td>
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#### Freshman Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
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</thead>
<tbody>
<tr>
<td>1st Year</td>
<td>Chem 105 (FWSpSu) 4.0</td>
</tr>
<tr>
<td>2nd Year</td>
<td>First-Year Writing or A Htg 100 3.0</td>
</tr>
<tr>
<td>3rd Year</td>
<td>Quantitative Reasoning (if needed) 3.0</td>
</tr>
<tr>
<td>4th Year</td>
<td>NDFS 191 (FW) (recommended) 1.0</td>
</tr>
<tr>
<td>5th Year</td>
<td>Religion Cornerstone course 2.0</td>
</tr>
<tr>
<td>6th Year</td>
<td>General elective 2.0</td>
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<tr>
<td>7th Year</td>
<td>Total Hours 15.0</td>
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</tbody>
</table>

### 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.
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, predental 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.

CARERS:
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.


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.