### Food Science (BS): Science Concentration

The Bachelor of Science degree in Food Science is offered through two curricula emphasizing science or technology. The science curriculum is designed for students desiring a more analytically intense program leading to technical careers in the food industry or graduate school. Students with an interest in business opportunities will find the technology program permits greater flexibility to pursue coursework in business, agricultural economics, or related fields.

#### Plan Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
<th>Counts towards</th>
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<tr>
<td><strong>Orientation</strong></td>
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<tr>
<td>ALS 103</td>
<td>Freshman Transitions and Diversity in Agriculture &amp; Life Sciences</td>
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<tr>
<td>or ALS 303</td>
<td>Transfer Transitions and Diversity in Agriculture &amp; Life Sciences</td>
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<tr>
<td><strong>Communication</strong></td>
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<tr>
<td>COM 110</td>
<td>Public Speaking</td>
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<td>or COM 112</td>
<td>Interpersonal Communication</td>
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<tr>
<td><strong>Mathematical Sciences</strong></td>
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<tr>
<td>MA 107</td>
<td>Precalculus I</td>
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<tr>
<td>MA 131 &amp; MA 132</td>
<td>Calculus for Life and Management Sciences A and Computational Mathematics for Life and Management Sciences</td>
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<td>MA 231</td>
<td>Calculus for Life and Management Sciences B</td>
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<td>ST 311</td>
<td>Introduction to Statistics</td>
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<td><strong>Sciences</strong></td>
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<tr>
<td>BIO 181</td>
<td>Introductory Biology: Ecology, Evolution, and Biodiversity</td>
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<td>or BIO 183</td>
<td>Introductory Biology: Cellular and Molecular Biology</td>
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<tr>
<td>CH 101 &amp; CH 102</td>
<td>Chemistry - A Molecular Science and General Chemistry Laboratory</td>
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<td>CH 201 &amp; CH 202</td>
<td>Chemistry - A Quantitative Science and Quantitative Chemistry Laboratory</td>
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<td>CH 221 &amp; CH 222</td>
<td>Organic Chemistry I and Organic Chemistry I Lab</td>
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<td>CH 223 &amp; CH 224</td>
<td>Organic Chemistry II and Organic Chemistry II Lab</td>
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<td>BCH 351</td>
<td>General Biochemistry</td>
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<td>MB 351 &amp; MB 352</td>
<td>General Microbiology and General Microbiology Laboratory</td>
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<td>PY 211</td>
<td>College Physics I</td>
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<tr>
<td>PY 212</td>
<td>College Physics II</td>
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<td><strong>Major Requirements</strong></td>
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<td>FS 201</td>
<td>Introduction to Food Science</td>
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<td>FS 231</td>
<td>Principles of Food and Bioprocess Engineering</td>
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<td>FS 290</td>
<td>Careers in Food and Bioprocessing Sciences</td>
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<td>FS 402</td>
<td>Chemistry of Food and Bioprocessed Materials</td>
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<td>FS 403</td>
<td>Analytical Techniques in Food &amp; Bioprocessing Science</td>
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<tr>
<td>FS 405</td>
<td>Food Microbiology</td>
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<td>FS 406</td>
<td>Food Microbiology Lab</td>
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<td>FS 421</td>
<td>Food Preservation</td>
<td>3</td>
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<td>FS 475</td>
<td>Problems and Design in Food and Bioprocessing Science</td>
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<td>NTR 301</td>
<td>Introduction to Human Nutrition</td>
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Food Science Electives (p. 2) 6

**GEP Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>ENG 101</td>
<td>Academic Writing and Research ¹</td>
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<td>GEP Humanities (<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/</a>)</td>
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<td>GEP Social Sciences (<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/</a>)</td>
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<td>GEP Health and Exercise Studies (<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/</a>)</td>
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<td>GEP US Diversity, Equity, and Inclusion (<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-usdei/</a>)</td>
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<td>GEP Interdisciplinary Perspectives (<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/</a>)</td>
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<td>GEP Global Knowledge (<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/</a>) (verify requirement)</td>
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<td>Foreign Language Proficiency (<a href="http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/">http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/</a>) (verify requirement)</td>
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</table>

**Free Electives**

Free Electives (12 Hr S/U Lmt) ² 7

**Total Hours** 120

¹ A grade of C- or higher is required.
² Students should consult their academic advisors to determine which courses fill this requirement.

### Food Science Electives

**Code** | **Title** | **Hours** | **Counts towards**
---|---|---|---
FS 250 | Basics of Food Safety & Quality | 3 | |
FS 322 | Muscle Foods and Eggs | 3 | |
FS 324 | Milk and Dairy Products | 3 | |
FS 325 | Introduction to Brewing Science and Technology | 3 | |
FS 330 | Science of Food Preparation | 3 | |
FS 352 | Introduction to Microbiological Food Safety Hazards | 3 | |
FS 354 | Food Sanitation | 3 | |
FS 401 | Advanced Nutrition and Metabolism | 3 | |
FS 416 | Quality Control in Food and Bioprocessing | 3 | |
FS 435 | Food Safety Management Systems | 3 | |
FS 453 | Food Laws and Regulations | 3 | |
FS 462 | Postharvest Physiology | 3 | |
FS 471 | Professionalism & Project Preparation in Food & Bioprocessing Science | 1 | |
FS 481 | Research Experience in Food and Bioprocessing Sciences | 3 | |
FS 501 | Advanced Nutrition and Metabolism | 3 | |
FS 516 | Quality Control in Food and Bioprocessing | 3 | |
FS 520 | Pre-Harvest Food Safety | 3 | |
FS 522 | Food Packaging | 3 | |
FS 530 | Post-Harvest Food Safety | 3 | |
FS 535 | Food Safety Management Systems | 3 | |
FS 540 | Food Safety and Public Health | 3 | |
FS 550 | Food Industry Study Tour | 2 | |
FS 553 | Food Laws and Regulations | 3 | |
FS 554 | Lactation, Milk, and Nutrition | 3 | |
FS 555 | Exercise Nutrition | 3 | |
FS 557  Nutraceuticals and Functional Foods  3
FS 562  Postharvest Physiology  3
FS 567  Sensory Analysis of Foods  3
FS 560  Professional Development and Ethics in Food Safety  1
FSA 520  Pre-Harvest Food Safety  3
FSA 530  Post-Harvest Food Safety  3
FSA 540  Food Safety and Public Health  3
FSA 580  Professional Development and Ethics in Food Safety  1

Semester Sequence
This is a sample.

First Year
Fall Semester
ALS 103  Freshman Transitions and Diversity in Agriculture & Life Sciences  1
BIO 183  Introductory Biology: Cellular and Molecular Biology  4
ENG 101  Academic Writing and Research  4
MA 107  Precalculus I  3
GEP Social Sciences (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-social-sciences/)  3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)  1

Hours  16

Spring Semester
CH 101  Chemistry - A Molecular Science  3
CH 102  General Chemistry Laboratory  1
FS 201  Introduction to Food Science  3
MA 131  Calculus for Life and Management Sciences A  3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)  3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)  1

Hours  16

Second Year
Fall Semester
CH 221  Organic Chemistry I  3
CH 222  Organic Chemistry I Lab  1

Hours  14

Fourth Year
Fall Semester
FS 421  Food Preservation  3
NTR 301  Introduction to Human Nutrition  3
Food Science Electives (p. 2)  3
GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)  3
ST 311  Introduction to Statistics  3

Hours  15

Spring Semester
FS 475  Problems and Design in Food and Bioprocessing Science  3
Food Science Electives (p. 2)  3
Career Opportunities

Consumer demand for safe, high quality, nutritious foods and biopharmaceutical products, as well as for educational programs designed to promote healthy eating, creates a variety of career opportunities in the food, pharmaceutical and the allied health industries. Industrial opportunities include management, research and development, process supervision, quality control and assurance, procurement, distribution, and sales. Public health opportunities include educational program development, delivery, and assessment. In addition, graduates hold positions with government agencies and many with advanced degrees have teaching and/or research positions in colleges and universities.

Food Science

Many career opportunities exist in the food and beverage industry, the world’s largest manufacturing sector, for graduates with a Food Science degree. Food science professionals are involved in the discovery of new food sources, new methods of food preservation, advances in food chemistry and sensory science and even product development. Positions are found worldwide, providing technical support to the food, beverage, and pharmaceutical industries and also government agencies. Food scientists work to ensure the safety and quality of foods through the application of basic scientific principles. The demand for food scientists continues to increase as the food industry expands.

The undergraduate Food Science major has two emphasis tracks. One is Science and the other is Technology. The B.S. in Food Science with a Science emphasis is designed for students who want more rigorous science courses to prepare them for graduate school or careers in the food, pharmaceutical, and or bioprocessing industries. The B.S. in Food Science with a Technology emphasis is designed for students more interested in business opportunities for technically trained individuals. It offers greater flexibility in complementing Food Science coursework with business, agricultural commodity, and computer science courses.

Scholarships

The department provides both merit and financial need scholarships to encourage and assist students preparing for careers in Food, Bioprocessing, or Nutrition Science.

Career Titles

- Agricultural Engineer
- Agricultural Inspector
- Chemical Technicians
- Dairy Technologist
- Food & Drug Inspector
- Food Science Technicians
- Food Technologist
- Laboratory Tester
- Sales Representative (Agricultural Products)

Learn More About Careers

NCcareers.org (https://nccareers.org/)
Explore North Carolina’s central online resource for students, parents, educators, job seekers and career counselors looking for high quality job and career information.

Occupational Outlook Handbook (https://www.bls.gov/ooh/)
Browse the Occupational Outlook Handbook published by the Bureau of Labor Statistics to view state and area employment and wage statistics. You can also identify and compare similar occupations based on your interests.

Career One Stop Videos (https://www.careeronestop.org/)
View videos that provide career details and information on wages, employment trends, skills needed, and more for any occupation. Sponsored by the U.S. Department of Labor.

Focus 2 Career Assessment (https://careers.dasa.ncsu.edu/explore-careers/career-assessments/) (NC State student email address required)
This career, major and education planning system is available to current NC State students to learn about how your values, interests, competencies, and personality fit into the NC State majors and your future career. An NC State email address is required to create an account. Make an appointment with your career counselor (https://careers.dasa.ncsu.edu/about/hours-appointments/) to discuss the results.

Institute of Food Technologists (https://www.ift.org/about-ift/)