FOOD SCIENCE (AGLS)

Food science is a degree program focused on food issues from the time crops leave the field until consumers buy the food products. Food scientists apply basic science (chemistry, biology, physics) to improve processing, preservation, and safety of food and to develop new food products. The food science major is approved by the Institute of Food Technologists.

Student Learning Outcomes

Upon graduation, students should be able to:

- Communicate effectively in their field of study using written, oral, visual and/or electronic forms.
- Demonstrate proficiency in ethical data collection and interpretation, literature review and citation, critical thinking and problem solving.
- Participate effectively in a group or team.
- Integrate creativity, innovation, or entrepreneurship in ways that produce value.
- Describe sociocultural competence relative to diversity, equity and/or inclusion.
- Explain how human activities impact the natural environment and how societies are affected.
- Meet program specific learning outcomes for the Food Science major.

The department also offers a food science minor. ([http://catalog.iastate.edu/collegeofagricultureandlifesciences/foodscienceandhumannutrition/#undergraduateminortext](http://catalog.iastate.edu/collegeofagricultureandlifesciences/foodscienceandhumannutrition/#undergraduateminortext))

Administered by the Department of Food Science and Human Nutrition

Courses listed below are required.

Total Degree Requirement: 120 cr.
Students must fulfill International Perspectives and U.S. Diversity requirements by selecting coursework from approved lists. These courses may also be used to fulfill other area requirements. Only 65 cr. from a two-year institution may apply to the degree which may include up to 16 technical cr.; 9 P-NP cr. of electives; 2.00 minimum GPA.

International Perspectives: 3 cr.
U.S. Diversity: 3 cr.
Communications and Library: 10 cr.

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<tr>
<td>ENGL 150</td>
<td>Critical Thinking and Communication</td>
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<td>ENGL 250</td>
<td>Written, Oral, Visual, and Electronic Composition</td>
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<tr>
<td>LIB 160</td>
<td>Introduction to College Level Research</td>
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<td>SP CM 212</td>
<td>Fundamentals of Public Speaking</td>
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Total Credits 10

Humanities and Social Sciences: 6-12 cr.
Select Humanities course from approved list 3

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<td>ECON 101</td>
<td>Principles of Microeconomics</td>
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<td>If H Sci student, select:</td>
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<tr>
<td>Additional Humanities course</td>
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Ethics: 3 cr.
FS HN 342  World Food Issues: Past and Present 3

Mathematical Sciences: 7-8 cr.
Select 4 credits from:

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<td>MATH 160</td>
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<td>or MATH 165</td>
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Select at least 3 credits from:

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<td>STAT 101</td>
<td>Principles of Statistics</td>
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Total Credits 7-8

Physical Sciences: 17-19 cr.

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<td>&amp; 177L</td>
<td>and Laboratory in General Chemistry I</td>
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<tr>
<td>CHEM 178</td>
<td>General Chemistry II</td>
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<tr>
<td>CHEM 231</td>
<td>Elementary Organic Chemistry</td>
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<tr>
<td>&amp; 231L</td>
<td>and Laboratory in Elementary Organic Chemistry</td>
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</tr>
<tr>
<td>or CHEM 331</td>
<td>Organic Chemistry I</td>
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<tr>
<td>&amp; CHEM 332</td>
<td>and Organic Chemistry II</td>
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<tr>
<td>PHYS 115</td>
<td>Physics for the Life Sciences</td>
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<td>&amp; 115L</td>
<td>and Laboratory in Physics for the Life Sciences</td>
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<tr>
<td>or PHYS 131</td>
<td>General Physics I</td>
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<td>&amp; 131L</td>
<td>and General Physics I Laboratory</td>
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Total Credits 17-19

Biological Sciences: 10-11 cr.

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<td>BBMB 301</td>
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<tr>
<td>or BBMB 303</td>
<td>General Biochemistry</td>
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<tr>
<td>or BBMB 316</td>
<td>Principles of Biochemistry</td>
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<td>BIOL 212</td>
<td>Principles of Biology II</td>
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<td>BIOL 212L</td>
<td>Principles of Biology Laboratory II</td>
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<td>MICRO 201</td>
<td>Introduction to Microbiology</td>
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<tr>
<td>or MICRO 302</td>
<td>Biology of Microorganisms</td>
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<td>MICRO 201L</td>
<td>Introductory Microbiology Laboratory</td>
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<td>or MICRO 302L</td>
<td>Microbiology Laboratory</td>
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Total Credits 10-11
### Food Science and Human Nutrition: 49 cr.

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<td>Food and the Consumer</td>
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<td>FS HN 110</td>
<td>Professional and Educational Preparation</td>
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<tr>
<td>FS HN 167</td>
<td>Introductory Human Nutrition and Health</td>
<td>3</td>
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<td>FS HN 203</td>
<td>Contemporary Issues in Food Science and Human Nutrition</td>
<td>1</td>
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<tr>
<td>FS HN 207</td>
<td>Processing of Foods: Basic Principles and Applications</td>
<td>3</td>
</tr>
<tr>
<td>FS HN 305</td>
<td>Food Quality Management and Control</td>
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<tr>
<td>FS HN 311</td>
<td>Food Chemistry</td>
<td>3</td>
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<tr>
<td>FS HN 311L</td>
<td>Food Chemistry Laboratory</td>
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<tr>
<td>FS HN 314</td>
<td>Professional Development for Culinary Food Science and Food Science Majors</td>
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<tr>
<td>FS HN 315</td>
<td>Professional Skills for Culinary Food Science and Food Science Majors</td>
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</tr>
<tr>
<td>FS HN 351</td>
<td>Introduction to Food Engineering Concepts</td>
<td>3</td>
</tr>
<tr>
<td>FS HN 403</td>
<td>Food Laws and Regulations</td>
<td>2</td>
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<tr>
<td>FS HN 406</td>
<td>Sensory Evaluation of Food</td>
<td>3</td>
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<tr>
<td>FS HN 407</td>
<td>Microbiological Safety of Foods of Animal Origins</td>
<td>3</td>
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<tr>
<td>FS HN 410</td>
<td>Food Analysis</td>
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<td>FS HN 411</td>
<td>Food Ingredient Interactions and Formulations</td>
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<td>FS HN 412</td>
<td>Food Product Development</td>
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<tr>
<td>FS HN 420</td>
<td>Food Microbiology</td>
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<td>FS HN 421</td>
<td>Food Microbiology Laboratory</td>
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<td>FS HN 471</td>
<td>Food Processing</td>
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<td>Food Processing Laboratory</td>
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**Total Credits**: 49

Select 5-6 credits from the following Professional Electives: 5-6

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<td>A B E 325</td>
<td>Biorenewable Systems</td>
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<tr>
<td>ACCT 215</td>
<td>Legal Environment of Business</td>
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<tr>
<td>ACCT 284</td>
<td>Financial Accounting</td>
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<td>ACCT 285</td>
<td>Managerial Accounting</td>
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<tr>
<td>AESHM 474</td>
<td>Entrepreneurship in Human Sciences</td>
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<tr>
<td>AGRON 450</td>
<td>Issues in Sustainable Agriculture</td>
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<tr>
<td>AN S 270</td>
<td>Foods of Animal Origin</td>
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<tr>
<td>AN S 270L</td>
<td>Foods of Animal Origin Laboratory</td>
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<tr>
<td>AN S 360</td>
<td>Fresh Meat Science and Applied Muscle Biology</td>
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<tr>
<td>AN S 460</td>
<td>Science and Technology of Value Added Meat Products</td>
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<tr>
<td>CHEM 211</td>
<td>Quantitative and Environmental Analysis</td>
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<td>CHEM 211L</td>
<td>Quantitative and Environmental Analysis Laboratory</td>
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<tr>
<td>CHEM 316</td>
<td>Instrumental Methods of Chemical Analysis</td>
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<td>Instrumental Analysis Laboratory</td>
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<td>ECON 235</td>
<td>Introduction to Agricultural Markets</td>
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<td>ECON 301</td>
<td>Intermediate Microeconomics</td>
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<tr>
<td>ECON 320</td>
<td>Labor Economics</td>
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<tr>
<td>ECON 335</td>
<td>The Economics of Global Agricultural Food and Bio-energy</td>
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<td>ECON 337</td>
<td>Agricultural Marketing</td>
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<td>ECON 362</td>
<td>Applied Ethics in Agricultural Business</td>
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<td>ECON 460</td>
<td>Agricultural, Food, and Trade Policy</td>
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<td>ENTSP 310</td>
<td>Entrepreneurship and Innovation</td>
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<td>FS HN 241</td>
<td>Introduction to Manufacturing Processes for Plastics</td>
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<td>FS HN 242</td>
<td>The US Food System</td>
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<td>FS HN 264</td>
<td>Fundamentals of Nutritional Biochemistry</td>
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<td>FS HN 265</td>
<td>Nutrition for Active and Healthy Lifestyles</td>
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<tr>
<td>FS HN 276</td>
<td>Understanding Grape and Wine Science</td>
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<td>FS HN 408</td>
<td>Dairy Products Evaluation</td>
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<td>FS HN 435</td>
<td>Analysis of Food Markets</td>
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<td>FS HN 442</td>
<td>Issues in Food and Society</td>
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<td>FS HN 460</td>
<td>Global Nutrition and Health</td>
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<td>FS HN 490B</td>
<td>Independent Study: Food Science</td>
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<td>FS HN 491B</td>
<td>Supervised Work Experience: Food Science</td>
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<td>FS HN 496</td>
<td>Food Science and Human Nutrition Travel Course</td>
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<td>Sensory Evaluation of Wines</td>
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<td>GLOBE 201</td>
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<td>Globalization and Sustainability</td>
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<td>Agricultural, Food and Natural Global Resource Systems</td>
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<td>HORT 221</td>
<td>Principles of Horticulture Science</td>
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<td>HORT 461</td>
<td>Fruit Crop Production and Management</td>
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<td>Vegetable Production and Management</td>
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<td>MGMT 371</td>
<td>Organizational Behavior</td>
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<td>MGMT 414</td>
<td>International Management</td>
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<td>MGMT 472</td>
<td>Diversity, Equity, and Inclusion in Organizations</td>
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<td>MIS 301</td>
<td>Management Information Systems</td>
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<td>MKT 340</td>
<td>Principles of Marketing</td>
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<tr>
<td>MKT 447</td>
<td>Consumer Behavior</td>
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<td>MKT 448</td>
<td>Global Marketing</td>
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**Total Credits**: 5-6
Electives: 2-13 cr. Select from any university coursework to earn at least 120 total credits. Food science internship experience is strongly recommended during the summers, and students can earn elective credits for the internship experience by enrolling in FS HN 491B.

Go to FS HN courses. (http://catalog.iastate.edu/azcourses/fs_hn/)

Food Science, B.S.

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<td>FS HN 167</td>
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<td>CHEM 178</td>
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<td>CHEM 177</td>
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<td>BIOL 212</td>
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<td>CHEM 177L</td>
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<td>ENGL 150</td>
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<td>LIB 160</td>
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<td>STAT 101 or 104</td>
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FS HN 407 | 3 | U.S. Diversity (if not already taken) or elective |

Elective* | 2 | Humanities/social science (H Sci) or elective (AgLS) |

* Choose elective courses to total equal to or greater than 120 credits.

Note: This sequence is only an example. The number of credits taken each semester should be based on the individual student’s situation. Factors that may affect credit hours per semester include student ability, employment, health, activities, and grade point considerations.

More information on the Food Science, Food Safety, and Food and Society minors can be found here: http://catalog.iastate.edu/collegeofagricultureandlifesciences/foodscienceandhumannutrition/#undergraduateminortext (http://catalog.iastate.edu/collegeofagricultureandlifesciences/foodscienceandhumannutrition/#undergraduateminortext).

The Department of Food Science and Human Nutrition offers a Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in Food Science and Technology. More information can be found here: https://www.grad-college.iastate.edu/academics/programs/apresults.php?id=50.