Twin Cities Campus

Food Science B.S.

Food Science & Nutrition

College of Food, Agricultural and Natural Resource Sciences

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2017
- Required credits to graduate with this degree: 120
- Required credits within the major: 76 to 85
- No.
- Degree: Bachelor of Science

Food science applies chemistry, microbiology, and engineering to the science and technology of developing healthy, safe, convenient, and innovative food products with extended shelf life. Chemistry is a major component in food science, because foods and their constituents undergo chemical reactions and interactions during thermal treatment, processing, refrigeration, freezing, storage and in the presence of unique additives or microbes. These chemical reactions and interactions impact flavor, texture, shelf life, and overall consumer acceptability. Microbiology is also key to the food science discipline. Food processing may involve the use of microorganisms as in the production of bread, cheese, yogurt, sauerkraut, and tempeh. On the other hand, control of spoilage and pathogenic microorganisms is important to extend a products shelf life, ensure safety, and prevent food borne outbreaks. Physics, mathematics, and engineering are applied in food science because foods must be prepared on a large scale utilizing various mechanical and automated procedures to ensure safety and product consistency. In the food science major, students also learn about sensory/consumer science, packaging, nutritional labeling, analytical procedures, as well as government regulations. The food science program is offered through the College of Food, Agricultural and Natural Resource Sciences.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

All major requirements must be taken A-F (unless only offered S-N), and students must earn a grade of at least C- or better.

Foundation Courses

Students must take either MATH 1142 or MATH 1271 & MATH 1272, as well as BIOC 3021 or BIOC 4331 & BIOC 4332.
BIOL 1009 - General Biology [BIOL] (4.0 cr)
CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)
CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)
CHEM 1062 - Chemical Principles II [PHYS] (3.0 cr)
CHEM 1066 - Chemical Principles II Laboratory [PHYS] (1.0 cr)
STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
MATH 1142 - Short Calculus [MATH] (4.0 cr)
or MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
or MATH 1271 - Calculus I [MATH] (4.0 cr)
MATH 1272 - Calculus II (4.0 cr)
PHYS 1201W *{Inactive}*[PHYS, WI] (5.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
Students in both tracks must take BIOC 3021 or approved equivalent
BIOC 3021 - Biochemistry (3.0 cr)
or BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)
or BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)

Interdisciplinary Learning

© 2005 by the Regents of the University of Minnesota
The University of Minnesota is an equal opportunity educator and employer.

Core coursework which fulfills the CFANS requirement for an interdisciplinary course.
FSCN 1102 - Food: Safety, Risks, and Technology [CIV] (3.0 cr)

Experiential Learning
Course which fulfills the CFANS requirements for an Experiential Learning course
FSCN 4349 - Food Science Capstone (2.0 cr)

Upper Division Writing Intensive within the Major
Students are required to take one upper division writing intensive course within the major. If that requirement has not been satisfied within the core major requirements, students must choose one course from the following list. Some of these courses may also fulfill other major requirements.
Take 0 - 1 course(s) from the following:
•FSCN 4312W - Food Analysis [WI] (4.0 cr)
•WRIT 3562W - Technical and Professional Writing [WI] (4.0 cr)

Program Sub-plans
Students are required to complete one of the following sub-plans.

Food Science Sub Plan A
Food Science Sub Plan A is an approved program by the Institute of Food Technologists (IFT), the professional organization for Food Science, and thus complies with the core competencies and student learning outcomes of IFT. Sub Plan A is comparable to other Food Science Programs across the nation that have IFT approval. Students graduating with Sub Plan A are in a competitive position to secure food industry jobs. Freshman and transfer students default into the Sub Plan A sub-plan. Students must meet with an adviser in order to declare Sub Plan B.

Additional Foundation Courses - Chemistry
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
CHEM 2311 - Organic Lab (4.0 cr)
Professional Courses
BBE 4744 - Engineering Principles for Biological Scientists (4.0 cr)
FSCN 3102 - Introduction to Food Science (3.0 cr)
FSCN 4121 - Food Microbiology (3.0 cr)
FSCN 4122 - Food Fermentations and Biotechnology (2.0 cr)
FSCN 4123 - Molecular Biology for Applied Scientists (1.0 cr)
FSCN 4131 - Food Quality (3.0 cr)
FSCN 4312W - Food Analysis [WI] (4.0 cr)
FSCN 4332 *{Inactive}*(3.0 cr)
FSCN 4311 - Chemical Reactions in Food Systems (2.0 cr)
FSCN 4112 - Food Chemistry and Functional Foods (3.0 cr)
FSCN 4481 *{Inactive}*(1.0 cr)
FSCN 1112 - Principles of Nutrition [TS] (3.0 cr)
Communication
WRIT 3562W - Technical and Professional Writing [WI] (4.0 cr)
Public Speaking/Professional Communication
COMM 1101 - Introduction to Public Speaking [CIV] (3.0 cr)
or AECM 2421W - Professional and Oral Communication for Agriculture, Food & the Environment [WI] (3.0 cr)
Additional Foundation Courses - Microbiology
FSCN 2021 - Introductory Microbiology (4.0 cr)
or VBS 2032 - General Microbiology With Laboratory (5.0 cr)
or MICB 3301 - Biology of Microorganisms (5.0 cr)

Food Science Sub Plan B
Food Science Sub Plan B is a shorter program than Sub PLan A. Students may use the free credits to minor in a different field, such as Chemistry, Microbiology, Biochemistry, Economics, Business management, or any other field of interest based on future career choices. Food Science Sub Plan B is not approved by IFT.

Additional Foundation Courses - Chemistry
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
Professional Courses
BBE 4744 - Engineering Principles for Biological Scientists (4.0 cr)
FSCN 1112 - Principles of Nutrition [TS] (3.0 cr)
FSCN 3102 - Introduction to Food Science (3.0 cr)

© 2005 by the Regents of the University of Minnesota
The University of Minnesota is an equal opportunity educator and employer.
Information current as of March 29, 2024

FSCN 4121 - Food Microbiology (3.0 cr)
FSCN 4122 - Food Fermentations and Biotechnology (2.0 cr)
FSCN 4123 - Molecular Biology for Applied Scientists (1.0 cr)
FSCN 4131 - Food Quality (3.0 cr)
FSCN 4312W - Food Analysis [WI] (4.0 cr)
FSCN 4332 *{Inactive}*(3.0 cr)
FSCN 4112 - Food Chemistry and Functional Foods (3.0 cr)
FSCN 4481 *{Inactive}*(1.0 cr)

Communication

WRIT 3562W - Technical and Professional Writing [WI] (4.0 cr)

Microbiology

FSCN 2021 - Introductory Microbiology (4.0 cr)
or VBS 2032 - General Microbiology With Laboratory (5.0 cr)

© 2005 by the Regents of the University of Minnesota
The University of Minnesota is an equal opportunity educator and employer.
Information current as of March 29, 2024