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Master of Professional Studies (Agriculture), MPS

The Master of Professional Studies (MPS) program in Food Science and Technology is designed for individuals who want to prepare for career opportunities in food science, but are not currently interested in research focused graduate degrees. The MPS program emphasizes breadth of training via course work rather than research experience. This master’s program may be completed in as little as two semesters and does not require thesis research. (See MPS degree requirements below.)

Areas of Specialization in Food Science & Technology

Food Science (General)
Advanced studies in food science (general) provide a broader, more varied education than is possible in the other specializations. Students who select this concentration should have some previous experience in food science and technology.

Students in food science (general) are expected to take courses in food chemistry, food engineering and processing, food microbiology, nutrition, and food marketing as well as in the supporting disciplines and commodity areas in their special interests.

Food Science & Technology MPS Project Examples

- Preventative and ameliorative effects of green tea components against the various pathologies and symptoms of Alzheimer’s disease
- Effects of the extraction conditions on the yield and gel strength of the gelatin form the skins of smoked salmon (Salmo salar)

Food Science & Technology MPS Alumni Outlook

Graduates from the Food Science & Technology MPS specialization have pursued the following:

- Further graduate education (MS, PhD programs), at institutions such as:
  - Binghamton University
  - University of Arkansas
  - Michigan State University
  - University of Illinois

- Industry. Examples of titles include:
  - Associate Product Developer
  - Food Scientist
  - Food and Flavor Technologist
  - Associate Food Technologist
  - Quality Assurance Practitioner
  - R&D Specialist

- Companies that have employed these graduates include:
  - The Dannon Company
  - Damodar Foods
  - Treatt USA
  - Joule Foods Pvt Ltd
  - Wonton Food Inc
  - Camerican International Inc
Suggested Food Science Courses

Fall Classes

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Total Credit Hours 13-15

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Total Credit Hours 12-14

* Courses are required for all Food Science Graduates

Additional Suggested Coursework

- FDSC 4100 Sensory Evaluation of Food
- FDSC 4400 Wine and Grape Flavor Chemistry
- AEM 4450 Towards a Sustainable Global Food System: Food Policy for Developing Countries
- AEM 4460 Food Marketing Colloquium
- FDSC 5940 Applied and Food Microbiology
- BTRY 6010 Statistical Methods I

Food Chemistry/Product Development

Food chemistry is concerned with analytical, biochemical, chemical, physical, nutritional, and toxicological aspects of foods and food ingredients. The long-term goals of research in food chemistry are to understand relationships between the structure and functional properties of food molecules and to improve the nutritional, safety and organoleptic aspects of food.

Students of food chemistry and product development must have a strong background in the basic sciences and should specialize in one or more of the following minor areas: organic chemistry, biochemistry, nutritional biochemistry, physical chemistry, toxicology, analytical chemistry, and chemical engineering.

Food Chemistry/Product Development MPS Project

Opportunities for projects in food chemistry include structure/function relationships in food molecules (rheology, emulsions, foams, gels); computer modeling of food molecules; effects of processing, fortification, and packaging on nutritional quality of foods; food toxicology; and flavor chemistry of fruits and vegetables.

Examples of past Food Chemistry/Product Development MPS projects:
- Effect of various processing methods on phenolic phytochemicals and their bioactivities
- Development of premium dried apple wedges
- Iron fortification of soy sauce with NaFeEDTA in Chia: chemistry, technology, efficacy, and safety

Food Chemistry MPS Alumni Outlook

Graduates from the MPS program specializing in Food Chemistry have obtained positions, such as:

- Further graduate education (MS, PhD programs), at institutions such as:
  - University of California-Berkley
  - Kansas State University

- Industry. Examples of titles include:
  - Food Safety & Quality Assurance Associate
  - R&D Technologist
  - Product Development Scientist
  - Production Supervisor
  - Sales & Product Manager
  - Supply Quality Technologist

- Companies that have employed these graduates include:
  - Gorton’s
  - Kerry Ingredients
  - Acme Smoke Fish Corp
  - Hilmar Cheese
  - Empresas Carozzi
  - TseTech
  - Pepperidge Farms
  - Indian Institute of Packaging
  - Mars
  - Aileen Cake and Cookies
Suggested Food Chemistry/Product Development Courses

Fall Courses

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**Total Credit Hours 16-18**

Spring Courses

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**Total Credit Hours 10-12**

* Courses are required for all Food Science Graduates

**Additional Suggested Coursework**

- FDSC 2000 Physiochemical and Biological Aspects of Foods
- FDSC 4020 Agriculture in Developing Nations I
- AEM 4020 Food and Brand Lab Workshop I
- AEM 4021 Food and Brand Lab Workshop II
- AEM 4080 Innovations and New Product Management
- FDSC 4250 Unit Operations and Dairy Foods Processing
- FDSC 5960 Food Safety Assurance
- HADM 4325 Product Development in Food and Beverage Industry
- AEM 4460 Food Marketing Colloquium
- BTRY 6010 Statistical Methods
- AEM 6440 Consumer Behavior

**Faculty in this concentration area include:** A. Abbaspourrad, T. Acree, D. Barbano, J. Brady, T. Brenna, R. Glahn, C. Lee, R.H. Liu, D. Miller, M. Mukai, O. Padilla-Zakour, R. Parker, J. Regenstein, G. Sacks, K. Siebert, and E. Tako.
Food Microbiology & Food Safety

Food Microbiology and Food Safety students can gain food safety and quality assurance experience in our food processing and development laboratory and state-of-the-art dairy processing plant. Opportunities also exist to participate in a student product development team and help to develop a HACCP plan for the new food products.

Students who specialize in food microbiology and food safety are expected to have sound undergraduate training in microbiology, physics, chemistry, organic chemistry, and biochemistry.

Food Microbiology & Food Safety MPS Project

Examples of past Food Microbiology and Food Safety MPS Projects include:
- The safety of U.S. food imports: current issues and challenges
- Heterologous expression of Thurincin H and its application in the food industry
- Effect of ultraviolet light on fresh fruit and produce surface decontamination
- Consumption of milk, risks of milk borne pathogens and control strategies a comparative study of the U.S. and India

Food Microbiology & Food Safety MPS Alumni Outlook

Graduates from the MPS program specializing in Food Microbiology and Food Safety obtained positions, such as:

- Industry. Examples of titles include:
  - Quality and Food Safety Manager
  - Regional Food Safety Auditor
  - Quality Assurance Technician
  - Food Safety Manager

- Companies that have employed these graduates include:
  - NSF International
  - KLN Family Brands
  - Perfection Foods Company
  - Amazon
Suggested Food Microbiology & Food Safety Courses

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* Courses are required for all Food Science Graduates

Additional Suggested Coursework

AEM 2480    Food and Consumer Packaged Goods Industry Dynamics
AEM 3430    Supply Chain Management Principles
BIOMS 4040  Pathogenic Bacteriology
BIOMS 4090  Principles of Virology
FDSC 4180   Food Chemistry II
FDSC 4210   Food Engineering Principles
AEM 4310    Agricultural and Food Policy
AEM 4450    Towards a Sustainable Global Food System: Food Policy for Developing Countries
AEM 4460    Food Marketing Colloquium
VTPMD 4640  Introduction to Epidemiology
MAE 5930    Systems Engineering and Six Sigma for the Design and Operation of Reliable Systems
BTRY 6010   Statistical Methods I
VTMED 6431  Microbial Safety of Animal-based Foods

Food Engineering
Food engineering plays a crucial role in the development of food products, processes and equipment. Because engineering is a quantitative discipline, the food engineer’s fundamental tool is mathematics and physics. Chemistry and microbiology are also important disciplines because processes of concern to food engineers may involve chemical reactions, microbial interactions, or both.

Food engineering students gain a thorough understanding of thermodynamics, reaction kinetics, and transport phenomena applied to food processes. Knowledge of computer programming, microprocessor applications, statistics, and engineering economics is encouraged. Courses are available in thermal processing and other unit operations, physical and engineering properties of foods, rheology, and food packaging.

Food Engineering MPS Project

Examples of Past MPS Projects:
- Multi-stage supercritical extraction of oil from potato chips
- Rheological properties of food materials
- Bio-separation and concentration processes using membranes
- Extrusion processing with supercritical-CO2
- Shelf-life extension and control of water activity
- Non-thermal processes and simulation studies for food safety
- Study of textural qualities of whole red meat and potential applications to food engineering

Food Engineering MPS Alumni Outlook

Graduates from the MPS program specializing in Food Engineering obtained positions, such as:

- Further graduate education (MS, PhD programs), at institutions such as:
  o Imperial College London
  o The Pennsylvania State University

- Industry. Examples of titles include:
  o Management Trainee
  o Food Technologist
  o Assistant Director
  o Research and Development Engineer

- Companies that have employed these graduates include:
  o Vitasoy International Holdings Ltd
  o Pepperidge Farm
  o David Michael Flavor Company
  o Indian Institute of Packaging
  o Empresas Carozzi
Suggested Food Engineering Courses

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* Courses are required for all Food Science Graduates

Additional Suggested Courses

- CEE 3230 Engineering Economics and Management
- MAE 3780 Mechatronics
- FDSC 4000 Current Topics in Food Science and Technology
- AEM 4080 Innovations and New Product Management
- FDSC 4170 Food Chemistry I
- FDSC 4180 Food Chemistry II
- CHEME 5430 Bioprocess Engineering
- MAE 5930 Systems Engineering and Six Sigma for the Design and Operation of Reliable Systems
- BTRY 6010 Statistical Methods I
- FDSC 4020/ International Agriculture in Developing Nations
- FDSC 6220 Functional Foods and Dietary Supplements for Health

*Faculty in this concentration area include:* A. Datta, J. Hunter, J. March, C. Moraru, O. Padilla-Zakour, S. Rizvi, and M. Shuler.
Dairy Processing
Dairy science involves the chemistry, microbiology, and engineering properties of dairy foods. Long-term goals of the dairy science program at Cornell are to improve the quality and safety of milk and processed dairy products and to develop improved methods for the manufacture of cheese and other dairy products. Cornell University is home to a number of programs and facilities committed to dairy research, including our state-of-the-art dairy processing plant, the Milk Quality Improvement Program, and the Northeast Dairy Foods Research Center. These resources are available to MPS students working on a project in Dairy Processing.

Prior training in dairy or food science and technology is desirable but not essential. Students of dairy science may choose courses in food science, animal science, dairy chemistry, microbiology, chemistry, and biochemistry.

Dairy Processing MPS Project

Examples of Past MPS Projects:
- Development of Greek style yogurt using milk fortified with micellar casein concentrate
- Developing an economic feasibility model for artisan cheese startups: case studies for Happy Cheese Maker & The Big Red Cheddar Cheese Project

Dairy Processing MPS Alumni Outlook

Graduates from the MPS program specializing in Dairy Processing obtained positions, such as:

- Industry. Examples of titles include:
  o Product Development and Marketing Manager
  o Quality and Food Science Technologist

- Companies that have employed these graduates include:
  o Grupo Industrial Cuadritos Biotek
  o Byrne Dairy
  o Hilmar Foods
  o Dannone
  o Tillamuk
Suggested Dairy Processing Courses

Fall Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDSC 4180</td>
<td>Food Chemistry II (includes dairy chemistry section)</td>
<td>3</td>
</tr>
<tr>
<td>FDSC 4210</td>
<td>Food Engineering Principles</td>
<td>3</td>
</tr>
<tr>
<td>FDSC 5000</td>
<td>MPS Project</td>
<td>1-3</td>
</tr>
<tr>
<td>*FDSC 6000</td>
<td>Seminar in Food Science</td>
<td>1</td>
</tr>
<tr>
<td>*FDSC 6010</td>
<td>Principles and Applications of Food Science and Technology</td>
<td>2</td>
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Spring Courses

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<th>Course</th>
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<tbody>
<tr>
<td>ANSC 4010</td>
<td>Dairy Industry Seminar</td>
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<tr>
<td>FDSC 4010</td>
<td>Concepts of Product Development</td>
<td>2</td>
</tr>
<tr>
<td>FDSC 4170</td>
<td>Food Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>FDSC 4250</td>
<td>Unit Operations and Dairy Foods Processing (lecture only)</td>
<td>2</td>
</tr>
<tr>
<td>FDSC 6650</td>
<td>Food and Bioprocessing Systems</td>
<td>2</td>
</tr>
<tr>
<td>FDSC 5000</td>
<td>MPS Project</td>
<td>1-3</td>
</tr>
<tr>
<td>*FDSC 6000</td>
<td>Seminar in Food Science</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>14-16</strong></td>
</tr>
</tbody>
</table>

* Courses are required for all Food Science Graduates

Additional Suggested Courses

FDSC 2000   Intro to Physiochemical and Biological Aspects of Food
ANSC 4000   Feeding the World: The Biological and Quantitative Analyses of Livestock and Crop Systems
FDSC 4100   Sensory Evaluation of Food
FDSC 4230   Physical Principles of Food Preservation and Manufacturing
BTRY 6010   Statistical Methods
AEM 6440    Consumer Behavior
VTPMD 7081  Cornell Dairy Center of Excellence Seminar Series

**Faculty in this concentration area include:** S. Alcaine, D. Barbano, K. Boor, C. Moraru, Y.H. Schukken, and M. Wiedmann.
Sensory Evaluation
Sensory evaluation uses test methods that provide information on how products are perceived through the senses. The importance of sensory perception to food quality is widely appreciated in the food industry, providing a demand for such specialists.

Like other quantitative disciplines, sensory evaluation attempts to provide precise and accurate measurements. Yet, because the data are collected from human beings, who are notoriously variable, sensory evaluation studies pose a special challenge, and statistical techniques are necessary. Basic principles of human judgment and perception are also important, and students are encouraged to take courses in the behavioral sciences. Cornell offers a unique range of courses in sensory evaluation.

Sensory Evaluation MPS Project
Research projects are conducted in three main areas. Methods research is aimed at providing improvements in the reliability and validity of sensory tests. Product-focused research uses sensory analysis to measure the success of variations in product processing or ingredients. Basic research on perception and human judgment advances our understanding of sensory function.

Examples of Past MPS Projects:
- Sensory evaluation in a classroom setting
- Analysis of processing variables on powdered milk
- The influence of sound on taste perception
- The effect of sugar and fat replacement on consumer response to ice cream
- Comparison of discrimination test methods: triangle test, same-different sureness test, and extended duo-trio test
- Investigation of relationships among chemesthetic sensations

Sensory Evaluation MPS Alumni Outlook
Graduates from the MPS program specializing in Sensory Evaluation obtained positions, such as:

- Industry. Examples of titles include:
  - Scientist
  - Flavor Technologist
  - Sensory Quality Control

- Companies that have employed these graduates include:
  - Association Biotech Led Enterprises
  - Firmenich
  - International Flavors and Fragrances
  - Kraft Foods
### Suggested Sensory Evaluation Courses

#### Fall Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
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<tr>
<td>FDSC 4100</td>
<td>Sensory Evaluation of Food</td>
<td>3</td>
</tr>
<tr>
<td>FDSC 4180</td>
<td>Food Chemistry II</td>
<td>3</td>
</tr>
<tr>
<td>FDSC 5000</td>
<td>MPS Project</td>
<td>1-3</td>
</tr>
<tr>
<td>*FDSC 6000</td>
<td>Seminar in Food Science</td>
<td>1</td>
</tr>
<tr>
<td>*FDSC 6010</td>
<td>Principles and Applications of Food Science and Technology</td>
<td>2</td>
</tr>
<tr>
<td>BTRY 6010</td>
<td>Statistical Methods I</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>14-16</strong></td>
</tr>
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#### Spring Courses

<table>
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<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>FDSC 4010</td>
<td>Concepts of Product Development</td>
<td>2</td>
</tr>
<tr>
<td>FDSC 4170</td>
<td>Food Chemistry I</td>
<td>3</td>
</tr>
<tr>
<td>FDSC 4400</td>
<td>Wine and Grape Flavor Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>BIONB 4910</td>
<td>Principles of Neurophysiology</td>
<td>4</td>
</tr>
<tr>
<td>FDSC 5000</td>
<td>MPS Project</td>
<td>1-3</td>
</tr>
<tr>
<td>*FDSC 6000</td>
<td>Seminar in Food Science</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>14-16</strong></td>
</tr>
</tbody>
</table>

* Courses are required for all Food Science Graduates

### Additional Suggested Courses

- BIONB 4300  Experimental Molecular Neurophysiology
- FDSC 4180  Food Chemistry II
- FDSC 4190  Food Chemistry Lab
- FDSC 4210  Food Engineering Principles
- FDSC 4230  Physical Principles of Food Preservation and Manufacturing
- FDSC 4400  Wine and Grape Flavor Chemistry
- PSYCH 6050  Perception
- PYSC 6120  Laboratory in Cognition and Perception
- FDSC 6220  Functional Foods and Dietary Supplements for Health
- FDSC 6940  Biology of the Chemical Senses

*Faculty in this concentration area include:* T. Acree, R. Dando, A.K. Mansfield, and K. Siebert.
Enology

Designed for students who want to enter the wine industry or allied fields, the Enology specialization emphasizes the scientific theory and practical knowledge necessary for understanding both day-to-day aspects of wine production and the greater global wine industry. Classes and labs address traditional and modern approaches to grape growing, winemaking and wine analysis.

Faculty in this concentration have expertise in analytical chemistry, sensory analysis, biology of yeast and bacteria, health effects, product development and sanitation. Because of the multidisciplinary nature of Enology, this concentration is suitable for students interested in careers in academia, industry and government in areas related to Enology as well as in any areas related to food and industrial fermentations.

Enology students should have a background in microbiology, organic chemistry or biochemistry, sensory science or engineering. Prior exposure to winemaking is highly desirable but not required.

Enology MPS Project

In addition to targeted class work, students are required to design and complete a project to enhance their expertise in areas specific to their career goals. Working with enology and viticulture faculty, MPS student pursue an individual project in wine chemistry, production methods, sensory evaluation, wine marketing or other related topics.

Examples of Past MPS Projects:
  - Developing new techniques for measuring sulfur dioxide in wine
  - Evaluating approaches for deacidifying high acid wines
  - The New York State Winery planning publication

Enology MPS Alumni Outlook

Graduates from the MPS program specializing in Enology obtained positions, such as:

- Further graduate education (MS, PhD programs), at institutions such as:
  - Ohio State University

- Industry. Examples of titles include:
  - Enologist
  - Sr. Research Fellow
  - Assistant Winemaker

- Companies that have employed these graduates include:
  - E. & J. Gallo Winery
  - Wine Research Institute
  - Damiani Wine Cellars
### Suggested Enology Courses

#### Fall Courses

<table>
<thead>
<tr>
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<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIEN 5204</td>
<td>Grapes to Wines Lecture</td>
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<tr>
<td>VIEN 2205</td>
<td>Grapes to Wines Lab</td>
<td>2</td>
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<tr>
<td>VIEN 5400</td>
<td>Wine and Grapes: Composition and Analysis</td>
<td>2</td>
</tr>
<tr>
<td>FDSC 4100</td>
<td>Sensory Evaluation of Food</td>
<td>3</td>
</tr>
<tr>
<td>FDSC 5000</td>
<td>MPS Project</td>
<td>1-3</td>
</tr>
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<td>*FDSC 6000</td>
<td>Seminar in Food Science</td>
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<tr>
<td>*FDSC 6010</td>
<td>Principles and Applications of Food Science &amp; Tech.</td>
<td>2</td>
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<td><strong>14-16</strong></td>
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#### Spring Courses

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>VIEN 3440</td>
<td>Viticulture and Vineyard Management</td>
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<tr>
<td>VIEN 4600</td>
<td>Wine and Food Fermentations</td>
<td>3</td>
</tr>
<tr>
<td>VIEN 4700</td>
<td>Winemaking Theory and Practice II</td>
<td>2</td>
</tr>
<tr>
<td>VIEN 4710</td>
<td>Winemaking Theory and Practice Laboratory II</td>
<td>1</td>
</tr>
<tr>
<td>FDSC 5000</td>
<td>MPS Project</td>
<td>1-3</td>
</tr>
<tr>
<td>*FDSC 6000</td>
<td>Seminar in Food Science</td>
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<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>10-12</strong></td>
</tr>
</tbody>
</table>

* Courses are required for all Food Science Graduates

### Additional Suggested Courses

- VIEN/ENTOM/PLPA 3200: Grape Pest Management
- VIEN/FDSD 4400: Wine and Grape Flavor Chemistry
- FDSC 4300: The Science and Technology of Beer Lab
- FDSC 4310: Science and Technology of Beer Lab
- FDSC 4370: Distillation Principles and Practices Lab
- VIEN/FDSC 4500: Winemaking Theory and Practice I
- VIEN/FDSC 4510: Winemaking Theory and Practice I Lab
- FDSC 4010: Concepts of Product Development
- FDSC 4170: Food Chemistry I
- FDSC 4180: Food Chemistry II
- FDSC 4190: Food Chemistry Lab
- FDSC 4230: Physical Principles of Food Preservation
- FDSC 6220: Functional Foods and Dietary Supplements for Health
- CSS 3150: Weed Biology and Management
- CSS 3210: Soil Management for Sustainability
- CSS 4130: Physiology and Ecology of Yield
- CSS 4200: Geographic Information Systems
- HORT 4250: Postharvest Biology of Agr. Crops
- CSS/ENTOM 4440: Integrated Pest Management
- HORT 4450: Ecological Orchard Management
- CSS/HORT 4660: Soil Ecology
- CSS 4720: Nutrient Management in Agro-Ecosystems

**Faculty in this concentration area include:** A.K. Mansfield and G. Sacks.
Requirements for the MPS Degree

Student Expectations

- Selection of major advisor. Must be finalized no later than three weeks after first registration.
- OPTIONAL - Selection of minor advisor. Students choosing to select a minor advisor should notify the Graduate Field Office of the name of the minor advisor. Minor advisors are not able to be added via Student Center.
- Understanding of MPS degree requirements (see next page).
- Regularly scheduled meetings. Meet with your advisor at least one week prior to the beginning of classes to discuss course selection and credit requirements. In addition, advisor and student must meet, in person, at least four times per semester (or once a month) to discuss academic progress.
- Development of an academic plan (see template on next page). The agreed upon academic plan should be signed by both the student and advisor and be submitted to the Graduate Field office for inclusion in the student’s file by September 15 for fall matriculates and February 15 for spring matriculates:
  - Number of semesters the student plans to be enrolled (2 to 4)
  - Courses to be taken each semester enrolled
  - Time line for completion of degree requirements
- Outline of MPS project paper. The student and advisor should work together to develop an outline of the MPS project paper to be submitted to the Graduate Field office for inclusion in the student’s file by the beginning of the first day of classes of the second semester of the student’s degree program. The outline should be 2-3 pages long, include an abstract as well as headers and sub-headers.
- Enrollment in at least 12 credits per semester, not including audited classes.
- NOTE: There is not a teaching or seminar requirement for MPS students. However, MPS students are encouraged to and can earn course credit as a teaching assistant.

Academic Requirements

- Satisfactory completion of a minimum of 30 credit hours related to the candidate's professional interest, as agreed upon with the advisor.
  - Twenty credit hours must be taken within the College of Agriculture and Life Sciences, and at least 24 credits must be in courses numbered 4000 or higher, except with the approval of the college MPS Committee. A petition for exceptions may be submitted by an individual student or by the Director of Graduate Studies for the field before enrolling in the course.
    - When planning your courses, if you realize you will not meet some of the specific credit requirements, you should fill out a petition (same link as above) and submit it to me with your academic plan.
    - Please note, the CALS Registrar are less lenient in allowing courses under the 4000 level count towards the MPS degree. It might be that students who petition this requirement will need to complete 34 academic credits, because they need extra undergraduate courses that don't count.
  - A maximum of 6 of the required 30 credit hours may be earned through the student's problem-solving project (FDSC 5000).
A maximum of 6 credit hours earned outside the program, at Cornell University or elsewhere, may be counted toward these requirements at the discretion of the student's advisor. These credits must be appropriate to the subject of study and completed not more than five years before admission. To transfer credits:

- Receive work with your academic advisor to determine if the courses work you are hoping to transfer does indeed make sense to count towards your MPS degree requirements.
- If your advisor approves the credits you would like to transfer, you will complete a general petition.
- Return the form to the Graduate Field Office.
- If the courses are approved towards the graduate degree, we would make an unofficial note on the student’s record. These transferred credits will NOT show on your official Cornell transcript.
- This should be done at the beginning of your MPS program (i.e. do not wait until the semester you plan to graduate before petitioning to transfer credits).

Enrollment in FDSC 6000, Seminar, each semester.
Enrollment in FDSC 6010, Principles and Applications of Food Science and Technology, during the first fall semester.
Enrollment in FDSC 6060, Graduate Student Research Hour, spring semester.
Enrollment in FDSC 6950, Current Readings in Food Science, once during academic program.

Fall and spring semesters are the only “true” semesters at Cornell. Tuition is charged based on the courses you take during these two semesters. If you want to stay during summer (May to August), you have two options:

- You may register in the Graduate School’s zero credit summer “research” class (this information will be sent out to you next April in the Grad School announcement). This means you will be in a registered student status during summer but since it is not an actual class (i.e. you will not receive course credit for summer registration) so there is no tuition charge. Many MPS students stay at Cornell during summer to finish their project papers.
- If there are courses you wish to take during summer, there is a separate enrollment/registration process and tuition charge (about $1,300 per credit hour). There are a limited number of summer courses are offered through the Cornell University School of Continuing Education and Summer Sessions. You will find information on their web site at: https://www.sce.cornell.edu/ss/. As far as I know, Food Science MPS students have not taken any summer courses, they complete their credits during fall and spring.

- Satisfactory completion of a problem-solving project under the supervision of the advisor. This project may be an action program, the development of a plan of attack for a pertinent problem, the development of materials or methodology suited to the student's situation, or the development and execution of research appropriate to the profession. A formal project report must be submitted to and approved by the student’s advisor.
- A minimum grade point average of 2.5 (minimum of 18 credit hours with letter grades at Cornell).
- Completion of the degree within four years of admission.
### Academic Plan for the MPS Program

**Student Name:**

**Advisor Name:**

**Semesters to complete MPS (highlight one):** 2 3 4

#### Course/Credit Requirement Worksheet for MPS Program

<table>
<thead>
<tr>
<th>Semester</th>
<th>Class</th>
<th>Credits</th>
<th>Grading (S/U or letter)</th>
<th>CALS Course (at least 20 credits)</th>
<th>4000 Level or Higher (at least 24 credits)</th>
<th>Letter Grade (at least 18 credits)</th>
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<tr>
<td>Fall 2015</td>
<td>FDSC 6000</td>
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<td>S/U</td>
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<td>S/U</td>
<td>1</td>
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</table>

**Total Credits:** 4 4 4 0

**Reminder of MPS Credit Requirements:**

- A total of 30 credits needed to complete MPS program
- At least 20 credits must be taken within the College of Agriculture and Life Sciences
- At least 24 credits must be in classes numbered 4000 or higher
- A max of 6 of the required 30 credit hours may be earned through the student’s problem-solving project (FD SC 5000)
- A minimum of 18 credit hours with letter grades
Degree Completion Steps

• Completion of an Application to Graduate. To be filled-out prior to the degree conferral date. Deadlines and Application to Graduate link available on line at http://cals.cornell.edu/mps/completing-mps-project/.

• MPS Project Submission Process
  o Student must obtain final approval of their Problem-Solving Project for content from their faculty advisor.
  o The Problem-Solving Project must be sent as a word document for formatting approval to the CALS MPS Office (calsprofprograms@cornell.edu) to verify that minimum formatting requirements are met. Response time is 2-4 days. Students working on a group Problem-Solving Project should copy the entire group when emailing the project for formatting approval.
  o When the student has advisor and formatting approval, the student will send a pdf of the project paper, along with their student ID number, cc’ Erin Atkins and CALS MPS office, to libcopycenter@cornell.edu (CU Olin Library Copy Center, B41 Olin) to be professionally printed and bound. Additional bound copies of the project paper may be required by the research advisor. Students should inquire with their advisor for specific requirements. Students requesting a copy for themselves need to include a mailing address in your email. Fees will be charged to your bursar account after submission. If you do not pay owed fees, a hold will be placed on your bursar account, and neither your transcript nor diploma will be released until all fees are paid. Bound copies will be delivered to Erin Atkins. She will obtain the signature of the advisor in the upper right hand corner of the Abstract page. The bound project will then be submitted to Mann Library by the College.
  o All students, must have their research advisors sign the Attestation Form and forward it to CALS MPS office (calsprofprograms@cornell.edu or send it to CALS Student Services, 140 Roberts Hall).

• Project presentation. Prior to the conferral of their degree, students will be expected to give a 10-15 minute presentation of their MPS project. MPS presentation days will be organized by the Field Office and will take place prior to each degree conferral deadline (May, August, and January).

• Attestation form. Once the project paper has been approved by the major advisor, the student should print the attestation form and obtain his/her major advisor signature. The attestation form is available on line at http://cals.cornell.edu/mps/completing-mps-project/. 


Coursework

All graduate students are required to enroll in at least 12 credits each semester. Course enrollment is the act of signing up for specific courses offered by Cornell’s colleges and schools. It is distinct from registration with the University. Students must enroll in courses within three weeks of registration. Students not enrolling in specific courses must enroll for thesis or dissertation research using either Graduate School or, if available, departmental course numbers assigned for that purpose.

Students may enroll in courses either for credit or audit. Auditing (which appears as “V” on unofficial transcripts) means that the student pledges regular class attendance but not necessarily participation in all aspects of the course. Audited courses do not count toward the 12 credit requirement each semester.

Through the seventh week of the semester, courses may be dropped, credit hours may be changed, and grading options may be changed, without penalty. After the seventh week, courses may be added and changes to credit hours and grading options may be made only in exceptional circumstances. A petition signed by the instructor and the student’s special committee chair is required.

A course dropped after the seventh week appears on transcripts with a “W,” signifying Withdrawn. Exceptions may be approved when a student submits a petition approved by both the instructor and the special committee chair. After the last day of classes for the semester, no course may be dropped and no changes may be made to credit hours and grading options.

There are only two course requirements for FST graduate students (FDSC 6000 and 6010). Beyond that, each student works with his/her special committee to choose courses that best fit the student’s degree program. However, to constitute a minimum exposure requirement in food science, it is recommended that students take at least one course in food science other than FDSC 6000 and 6010.

All graduate students are required to register for:

- FDSC 6000, Seminar (every semester)
- FDSC 6010, Principles and Applications of Food Science and Technology (first fall semester)

Food Science 6000 Seminar

All graduate students must enroll in this course each semester, unless you are granted an exemption (see next page for details). Students missing more than two seminars without a written excuse will be given an unsatisfactory (U) grade. Each semester volunteers are needed to assist with seminar, students may be appointed to this position.

- Ithaca Seminar – Tuesdays from 4:00 to 5:00 in room 146 Stocking Hall
- Geneva Seminar – Tuesdays from 4:00 to 5:00 (room 150 Geneva Food Science Building)

Exemptions:

Students, who have a class conflict with the seminar schedule during a given semester, may request a waiver of the seminar requirement for that semester. Waiver requests should be sent to the Graduate
Field Coordinator with a copy to your advisor/committee chair. The waiver request must provide the class information (i.e. number, title, description) and must be a course that is required for your degree.

Make-up Seminars:
If a student misses more than two seminars, which results in not meeting the attendance requirement, the student may request that a substitute seminar be used as credit towards the missed Food Science seminar. Missed seminars may be made-up ONLY if (1) your advisor/committee chair agrees you can make up the seminar, (2) the Graduate Field Coordinator has been notified of the third seminar absence via e-mail with a copy to the advisor/committee chair beforehand, (3) the student is granted permission to make-up the missed seminar by attending a seminar in a department other than food science, and (4) a report and evidence of the attendance from the make-up seminar is submitted to the Graduate Field Coordinator no later than two weeks after the missed seminar.

**Food Science 6010, Principles and Applications of Food Science and Technology**
This is a 2 credit course, team-taught by faculty members, that is required of all graduate students with majors and minors in Food Science and Technology. The course is taught during the fall semester only. Students matriculating in the spring should sign up for the class during the fall. The course objectives are:

- To provide Food Science and Technology graduate students with a common experience
- To introduce new graduate students to the graduate faculty in food science
- To expose students to the many research opportunities food science offers
- To help students learn to critically evaluate research papers in food science
- To present and discuss concepts and principles that are fundamental to the discipline of food science
- To discuss current issues and controversies related to food and nutrition
- To raise and discuss ethical issues related to scientific conduct, publishing, and citing the work of others in written and oral presentations

**FDSC 6060, Food Science Graduate Student Research Hour**
This course is required of all graduate students in the Field of Food Science and Technology. The course is designed to foster connections between our graduate student population in the Field of Food Science. The class meets once per week, where students will present for either 15 or 30 minutes on their own research. Each presentation will be followed by questions from the class. The course will also provide an introduction to the following topics: research integrity, publication process, statistics in publishing, opportunities for graduate student funding, and grant writing.

**FDSC 6940 Special Topics in Food Science**
The department teaches “trial” courses and workshops under this number. Offerings vary by semester and are advertised by the department before the semester starts. You **MUST** apply and be accepted into this course before registering or including it in your academic plan.

**FDSC 6950, Current Readings in Food Science**
This course is designed to give members of the food science and broader scientific community an opportunity to stay up-to-date on the most current discoveries and methods used in food science. The course is designed to foster meaningful discussions about (1) recent publications in respected journals of basic research and (2) how these discoveries can be applied to research within the field of food science.
Format consists of weekly discussion groups with each participant presenting at least one oral report based on independent reading. Multiple sections focusing on different topics may be taught in any given semester. Topics include food microbiology and food safety, food chemistry, sensory evaluation, and food engineering and materials science. Interested students should contact the designated instructor(s) for each semester. Learning objectives include developing a habitual engagement with current literature, improving skills related to the critical evaluation of methods and conclusions, and fostering graduate student-lead communication.

- At least two section topics will be offered every semester. Students select one of the two section topics to participate in when they enroll. MPS/MS students are required to participate in one section during their program. PhD students are required to participate in two sections during their program.

**FDSC 6960 Graduate Internship in Food Science**
On-the-job learning experience under the supervision of professionals in a cooperating organization. Current internship opportunities can be accessed by contacting the Graduate Field Coordinator or students have the option of locating their own internship. A learning contract is written between the faculty supervisor and student, stating the conditions of the work assignment, supervision and reporting. All 6960 internship courses must adhere to the CALS guidelines at [www.cals.cornell.edu/cals/current/student-research/internship/index.cfm](http://www.cals.cornell.edu/cals/current/student-research/internship/index.cfm)

**FDSC 6970 Graduate Individual Study in Food Science**
Due the flexible nature of our MPS program, students are able to seek out additional learning opportunities through individual study. Students should be able to identify early in their first semester, with advisor approval, if they will meet their course requirements through an independent study.
Special Project and Research

MPS students do not submit a thesis, but are required to complete a special project. Students should enroll in research credits if spending time in the lab working on their MPS project. The number of credits to sign up for is determined by the advisor/committee chair.

- FDSC 5000 – MPS special project credits (1-6 credits per semester)

Minimum Grade Standards

Students are expected to strive for excellence in all aspects of their graduate programs; performance in courses is one indicator of academic progress. The field adopted the following standards for evaluating performance in courses based on a normal semester course load (generally a minimum of 10-12 credits):

- **MPS candidates** – a student should obtain at least a 2.5 average each semester to remain within the College of Agriculture and Life Sciences standards.

The following statement of the Graduate School is in keeping with the above:

"Grades of C+ through D-, while passing, do not normally constitute satisfactory progress for a student enrolled in the Graduate School. The same holds for Incompletes."
Teaching

MPS students are not required to serve as a TA; however, may do so to earn course credit. Students can receive between 1-3 credits in Food Science 6980 for this experience as follows:

- 1 to 2 credits are earned depending on the type of course and responsibilities. The instructor of the course that the student is assigned to determines the credits earned.
- 1 additional credit can be earned for attending a graduate teaching development workshop. For workshop information visit http://www.cte.cornell.edu/programs-services/grads-future-educators-tas/get-set-workshops.html

International Teaching Assistants Program (ITAP)

Students who come from non-English speaking countries must participate in an ITAP Language Assessment prior to the first day of classes.

- Interview Scheduling: Erin Atkins will be in contact in early August (for fall incoming students) or early December (for spring incoming students) to schedule a language assessment.
- Interview Structure: The 30-minute language proficiency assessment includes an oral interview and teaching presentation. During the oral interview, the interview committee asks a variety of questions seeking a broad speech sample on which to determine their assessment. Questions are asked that require the student to speak using a variety of time frames. For the second part, ITAs are asked to prepare a five-to-seven minute explanation of a field specific term, principle or concept at a level appropriate for their future students. Faculty representatives might be able to suggest one that is most relevant to the teaching assignment.
- Interview Result: The three possible outcomes of the assessment are as follows:
  - ALS 5780 is required before beginning a teaching assignment.
  - ALS 5780 can be taken concurrently with the teaching assignment.
  - ALS 5780 is optional for the ITA.
  - Additionally, there may be other course requirements depending on the outcome of the course 5780.

The B.L. Herrington Graduate Student Teaching Award

Friends and former students of Professor Emeritus B.L. Herrington have established a fund to reward outstanding graduate teaching associates (one first place and two honorable mentions). The awards will be presented at the end of each spring semester and the first place winner will be recognized at the College level with a luncheon for the winners from all the College of Agriculture and Life Sciences. Eligibility Requirements: Open to all students who serve as a TA for at least one semester.
Institute of Food Technologists Core Competencies in Food Science
Students enrolled in the Field of Food Science & Technology are expected to hold a certain level of competency in food science. The list below outlines the general areas of food science and the information students conferring a degree from the program need to know.

Food chemistry and analysis
• Structure and properties of food components, including water, carbohydrates, protein, lipids, other nutrients and food additives: Understand the chemistry underlying the properties and reactions of various food components. Chemistry of changes occurring during processing, storage and utilization: Have sufficient knowledge of food chemistry to control reactions in foods.
• Understand the major chemical reactions that limit shelf life of foods
• Be able to use the laboratory techniques common to basic and applied food chemistry
• Principles, methods, and techniques of qualitative and quantitative physical, chemical, and biological analyses of food and food ingredients: Understand the principles behind analytical techniques associated with food.
• Be able to select the appropriate analytical technique when presented with a practical problem
Demonstrate practical proficiency in a food analysis laboratory

Food safety and microbiology
• Pathogenic and spoilage microorganisms in foods: Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow.
• Identify the conditions under which the important pathogens are commonly inactivated, killed or made harmless in foods
• Utilize laboratory techniques to identify microorganisms in foods
• Beneficial microorganisms in food systems: Understand the principles involving food preservation via fermentation processes.
• Influence of the food: Understand the role and significance of system on the growth and survival of microorganisms microbial inactivation, adaptation and environmental factors (i.e., aW, pH, temperature) on growth and response of microorganisms in various environments.
• Control of microorganisms: Be able to identify the conditions, including sanitation practices, under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods.

Food processing and engineering
• Characteristics of raw food material: Understand the source and variability of raw food material and their impact on food processing operations. Principles of food preservation including low and high temperatures, water activity, etc. Know the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage. Understand the principles that make a food product safe for consumption
• Engineering principles including mass and energy balances, thermodynamics, fluid flow, and heat and mass transfer: Understand the transport processes and unit operations in food processing as demonstrated both conceptually and in practical laboratory settings.
• Be able to use the mass and energy balances for a given food process
• Understand the unit operations required to produce a given food product
• Principles of food processing techniques, such as freeze drying, high pressure, aseptic processing, extrusion, etc.: Understand the principles and current practices of processing techniques and the effects of processing parameters on product quality.
• Packaging materials and methods: Understand the properties and uses of various packaging materials.
• Cleaning and sanitation: Understand the basic principles and practices of cleaning and sanitation in food processing operations.
• Water and waste management: Understand the requirements for water utilization and waste management in food and food processing.

Applied food science
• Integration and application of food science principles (food chemistry, microbiology, engineering/processing, etc.): Be able to apply and incorporate the principles of food science in practical, real world situations and problems. Computer skills: Know how to use computers to solve food science problems. Statistical skills: Be able to apply statistical principles to food science applications. Quality assurance: Be able to apply the principles of food science to control and assure the quality of food products.
• Analytical and affective methods of assessing sensory properties of food utilizing statistical methods: Understand the basic principles of sensory analysis.

Current issues in food science: Be aware of current topics of importance to the food industry. Food laws and regulations: Understand government regulations required for the manufacture and sale of food products.

Success skills
• Communication skills (i.e., oral and written communication, listening, interviewing, etc.): Demonstrate the use of oral and written communication skills. This includes such skills as writing technical reports, letters and memos; communicating technical information to a non-technical audience; and making formal and informal presentations. Critical thinking/problem solving skills (i.e., creativity, common sense, resourcefulness, scientific reasoning, analytical thinking, etc.): Define a problem, identify potential causes and possible solutions, and make thoughtful recommendations. Apply critical thinking skills to new situations.
• Professionalism skills (i.e., ethics, integrity, respect for diversity): Commit to the highest standards of professional integrity and ethical values. Work and/or interact with individuals from diverse cultures.
• Life-long learning skills: Explain the skills necessary to continually educate oneself.
• Interaction skills (i.e., teamwork, mentoring, leadership, networking, interpersonal skills, etc.): Work effectively with others. Provide leadership in a variety of situations.
• Deal with individual and/or group conflict.
• Information acquisition skills (i.e., written and electronic searches, databases, Internet, etc.): Independently research scientific and nonscientific information.
• Competently use library resources.
• Organizational skills (i.e., time management, project management, etc.): Manage time effectively. Facilitate group projects.
• Handle multiple tasks and pressures.
Maintaining a Student Status

All students are required to be registered during each semester of the degree program until the degree is conferred. Any interruption of continuous registration is considered a withdrawal. It is the student’s responsibility to make sure s/he is registered. International students should contact the International Students and Scholars Office if they have any questions about maintaining a student visa status.

In Absentia Status

A student may petition for in absentia status only for legitimate academic (not personal) reasons, for instance; serving as an intern or performing research elsewhere. Application for in absentia registration is granted only if the student's program can best be fulfilled by work at an institution or location other than Cornell. Registration forms for students who will be registered in absentia (off-campus) should be completed and returned to the Graduate School before the start of the semester.

In absentia status will not normally be granted to students who have spent fewer than two terms of residence at Cornell. A request for in absentia status should be discussed in advance with the Graduate School staff to ensure that the student's proposal meets the criteria for in absentia status.

Students registered in absentia are considered, and must be, full-time students. They may not receive compensation other than fellowships, assistantships, or the equivalent.

- **Note:** International students planning to register in absentia should consult with the International Students and Scholars Office.
- **Residence units:** A PhD candidate may earn not more than two residence units, and a master’s degree candidate not more than one, toward the fulfillment of the minimum residence requirements of that degree for work done in absentia. Professional degree requirements differ and are evaluated differently.
- **Health insurance:** A student registered in absentia may still be enrolled in the student accident and sickness insurance plan. Students should complete the insurance form attached to the in absentia petition.

Leaves of Absence Status

Students may request a leave at any time for personal or medical reasons.

- Leaves are granted for a period of up to 12 months; however they can be extended. Health Leaves of absence are automatically renewed upon request of the student. Personal Leaves are renewed at the discretion of the field.
- The maximum number of years allowed for a leave of absence is four. If the period of the leave has been exceeded, the student may re-apply for admission, but the Field is not required to re-admit. Students returning from approved health leave within the four-year window are guaranteed any financial support remaining from their original offer of admission, although the specific duties associated with that support may be adjusted.
- A student who takes a leave of absence may not receive payment in the form of a fellowship, teaching assistantship or graduate research assistantship and relinquishes access to campus facilities and personnel that normally accompanies student status.
- Time spent on leave of absence does not count toward time-to-degree limits.
Withdrawal
Students may withdraw from their program at any time. Withdrawal is appropriate for students who do not intend to resume studies or to complete an advanced degree at Cornell University. Any interruption of registration is considered a withdrawal unless the student has been granted a leave of absence.

Summer Registration
Graduate students must register with the Graduate School for the summer if they are receiving financial aid during the summer—e.g. fellowships, summer loans, assistantships, travel grants, or tuition awards, if they wish to use campus facilities, or if they are off campus but need to be registered for summer study.

Students who were registered with the Graduate School for one or both semesters of the preceding academic year may register with the Graduate School for the summer without charge, as long as they are not requesting registration units for summer study. To register, students enroll in the Graduate School’s “Thesis/Dissertation Research” summer course via Student Center. When registration units are to be awarded for summer study, tuition must be paid for summer registration.

Pro-rated tuition
Students who have successfully completed two full-time semesters of coursework may be eligible for pro-rated tuition in their FINAL semester only. Status is by application-only to CALS. Contact Erin to obtain the application form.
Program Assessment Plan for the Graduate Field of Food Science and Technology

The Graduate Field of Food Science and Technology at Cornell University has three degree programs (MPS, MS, and PhD) that each has a separate set of goals for student learning and separate set of procedures for gathering information on achievement of these goals. The information gathered through the procedures detailed here will be used to formally evaluate every program every three years in the January meeting of the Field of Food Science and Technology. The schedule for evaluation will include a formal evaluation of the MPS program in January 2013, of the MS program in January 2014, and of the PhD program in January 2015. For each evaluation, the Director of Graduate Studies (DGS) and the Graduate Field Assistant (GFA) will summarize the information gathered and will present it to the Graduate Field. Based on the discussions at the field meeting and following a simple consensus building approach, the DGS will prepare a short written summary (1 page or less) that details actions that will be taken to improve the degree program that was reviewed. If desired by the Graduate Field a committee of three field members will be appointed to further improve and refine the evaluation of a given degree program and to develop approaches to improve a given degree program.
Assessment Plan for the Graduate Field of Food Science and Technology

Goals for Student Learning

When students complete the MPS they should be able to:

1. Demonstrate knowledge of theory and practice across at least two sub-disciplines in the field.
2. Demonstrate in-depth knowledge of at least one area of expertise.
3. Follow ethical guidelines for work in the field.
4. Write and speak effectively to professional and lay audiences about issues in the field.

Collection of Information about MPS Student Achievement of the Goals and Use of the Information

<table>
<thead>
<tr>
<th>Measures</th>
<th>Goals</th>
<th>Use of the Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>The MPS advisor approves an academic plan, which will be submitted to the Graduate Field Office for inclusion in the student’s file by September 15 for fall matriculates and February 15 for spring matriculates. This outline includes (i) Number of semesters the student plans to be enrolled (2 to 4); (ii) Courses to be taken each semester enrolled; and (iii) Time line for completion of degree requirements.</td>
<td>All</td>
<td>The DGS reviews these plans as well as MPS students' performance in call classes (i.e., grades) annually for issues that need to be addressed. Every three years the DGS and the Graduate Field Assistant (GFA) will prepare summaries of the data, which will be presented and discussed at the January field meetings in 2013, 2016, etc.</td>
</tr>
<tr>
<td>At the end of each semester, the MPS advisor completes an evaluation of the MPS student using the rubric for evaluation of MPS Student Progress</td>
<td>All</td>
<td>Reviewed by the DGS and reported to the January field meetings as detailed above.</td>
</tr>
<tr>
<td>The MPS advisor evaluates every thesis for originality, cogency, and clarity of presentation (Use rubric and evaluation form for MPS Project Report)</td>
<td>1, 4</td>
<td>Reviewed by the DGS and reported to the January field meetings as detailed above.</td>
</tr>
<tr>
<td>The field tracks students’ Internships</td>
<td>1,2</td>
<td>Reviewed by the DGS and reported to the January field meetings as detailed above.</td>
</tr>
<tr>
<td>The field tracks graduates’ employment and placement for a period of at least 5 years post-graduation</td>
<td>1,2</td>
<td>Reviewed by the DGS and reported to the January field meetings as detailed above.</td>
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</tbody>
</table>
Rubric for Evaluation of MPS Student Progress

The purpose of this evaluation is 2-fold: 1. To monitor the performance and progress of our students and 2. To develop evidence for assessing the quality of the MPS program overall. Advisors may use grades, conversations with the student, the project outline, the project report, and other observations to make their assessments. This evaluation should be turned in to the Graduate Field Office at the end of each semester for each student. It is up to the advisor whether or not to share the evaluation with the student.

Choose rating (1, 2, 3, 4, or 5) that applies for each outcome category

<table>
<thead>
<tr>
<th>Graduate Education Outcomes -- The student will be able to:</th>
<th>1 (Unacceptable)</th>
<th>2 (Fair)</th>
<th>3 (Good)</th>
<th>4 (Very Good)</th>
<th>5 (Outstanding)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate knowledge of appropriate subdiscipline(s) of food science.</td>
<td>Gaps in basic knowledge. Does not understand basic concepts, processes, or conventions of the discipline.</td>
<td>Displays a basic understanding of the field. Lacks some basic concepts, processes, or conventions of the discipline.</td>
<td>Displays a strong understanding of the field.</td>
<td>Displays a solid understanding of the field. Some exploration of interesting issues and connections beyond the basics.</td>
<td>Demonstrates thorough mastery as well as creativity in drawing on multiple sources. Synthetic and interdisciplinary. Demonstrates a deep understanding of the discipline.</td>
</tr>
<tr>
<td>Show effective oral communication skills.</td>
<td>Argument is weak, inconsistent, contradictory, unconvincing or invalid.</td>
<td>Provides basic results and answers. Clear and coherent.</td>
<td>Provides solid, expected results and answers. Clear and coherent.</td>
<td>Gives a solid argument with novel or fresh insights. Original with clear and coherent details.</td>
<td>Compelling, exciting, and persuasive. Has a point of view and a confident, independent, authoritative voice.</td>
</tr>
<tr>
<td>Respond adequately to questions posed.</td>
<td>Unable to articulate an argument.</td>
<td>Provides a coherent response with some logic gaps or inconsistencies.</td>
<td>Provides a clear response with few or no logic gaps or inconsistencies.</td>
<td>Shows understanding and mastery of subject matter.</td>
<td>Exhibits mature, independent thinking. Demonstrates command and authority over the material.</td>
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<tr>
<td>Display effective written communication skills.</td>
<td>Academic writing lacks structure and organization. Writing has extensive spelling and grammatical errors.</td>
<td>Writing is adequate. Structure and organization are weak but sufficient.</td>
<td>Well written and well organized.</td>
<td>Very well written and organized, with attention to detail.</td>
<td>Concise, elegant, engaging, interesting, sophisticated, and original. Connects components seamlessly.</td>
</tr>
<tr>
<td>Effectively frame or communicate the student's project.</td>
<td>No project. Question or problem is trivial, weak, unoriginal, or previously solved.</td>
<td>Demonstrates competence but is not very original or significant. Displays little creativity, imagination, or insight.</td>
<td>Demonstrates competence. Has some original ideas, insights, and observations.</td>
<td>Has a compelling question or problem. Argument is strong, comprehensive, and coherent. Has original ideas, insights, and observations.</td>
<td>Argument is focused, logical, rigorous, and sustained. Proposed project is original, ambitious, creative, significant, and thoughtful. Asks new questions or addresses an important question or problem.</td>
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</tbody>
</table>
Rubric for evaluation of MPS Project Report

The purpose of this evaluation is to develop evidence for assessing the quality of the MPS project. This evaluation should be turned in to the Graduate Field Office after completion of the MPS Project Presentation for each student. It is up to the advisor whether or not to share the evaluation with the student.

Choose rating (high pass, pass, low pass, fail, no information) that applies for each outcome category

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<tr>
<th></th>
<th>HP</th>
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<th>LP</th>
<th>F</th>
<th>n/i</th>
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<tbody>
<tr>
<td>The MPS project report is</td>
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<tr>
<td>• Formatted in a manner appropriate to the discipline</td>
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<tr>
<td>• Uses citations correctly and effectively</td>
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<tr>
<td>• Is written in a professional style</td>
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<tr>
<td>Project objective and goals are well-defined and clearly stated.</td>
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<tr>
<td>Literature review is current, comprehensive, and provides the relevant context for project report.</td>
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<tr>
<td>Literature is synthesized and evaluated critically in a manner that demonstrates a comprehensive understanding of the issue and its significance.</td>
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<tr>
<td>Tables and figures are used effectively.</td>
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<tr>
<td>Project report applies a critical perspective to the issue and draws appropriate conclusions stating the strengths, weaknesses, and limitations of the report and the conclusions</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Conduct of project report and use of literature meets ethical standards.</td>
<td></td>
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</tr>
</tbody>
</table>
**Food Science Department Information**

**Ithaca**

**Building Keys:** Building security is a matter of utmost concern to the Department. Key card access to labs or other areas can be obtained by emailing Amber Smith (als486@cornell.edu) with a cc to your advisor or committee chair.

**Mailboxes:** Graduate students are not routinely assigned a mailbox. If you need to receive mail within the department, email Amber Smith (als486@cornell.edu) for a mailbox assignment.

**Geneva**

**Building Keys:** Building security is a matter of utmost concern to the Department. Keys for the front door and individual labs may be obtained in Room 125 Food Research Building from Sarah Lincoln. Lab keys will be issued upon approval of your Committee chairperson. A key deposit of $10.00 is required, and will be refunded when the keys are returned. Please DO NOT loan or give your key to another person.

**Mailboxes:** Graduate student mailboxes are located in Room 148. Be sure mail has your name on it before opening. Check your mailbox frequently, as messages will be distributed by this means.

**Bulletin Board:** A bulletin board specifically for graduate student announcements is located in Room 148. Check it regularly.

**Photocopy Policy:** Obtain a copier code from your faculty advisor.

**SAGES:** The Student Association of the Geneva Experiment Station (SAGES) was founded in 1994 with the purpose of promoting a closer relationship between the faculty and students at the Station. It also acts as a representative of the student body, and organizer of community student activities. More information is available at [http://sagesnysaes.wordpress.com/](http://sagesnysaes.wordpress.com/).
Student Resources & Important Links

Grievance Procedures
The Grievance Procedure for Graduate Students Relating to Graduate Education and Support outlines general provisions and procedural steps for handling most grievances involving graduate students and faculty members, including issues such as academic integrity, remuneration, or joint publication. All conflicts should be dealt with in a patient, sensitive, and dignified manner. Detailed information about the grievance procedure is at http://www.gradschool.cornell.edu/policies-and-forms/grievance-procedures.

The University Ombudsman
Staff in the Ombudsman’s office is available to discuss any grievance that a graduate student may have. A student who feels he or she is being treated unfairly in any way may contact that office at 118 Stimson Hall, ombudsman@cornell.edu, 255-4321. Additional information can be accessed at http://ombudsman.cornell.edu/. The main purpose of the Ombudsman’s office is to seek the just and equitable resolution of conflicts within the University. The office is independent of the University administration and all other groups on campus.

Cornell’s Commitment to Diversity
Ever since Ezra Cornell and A.D. White joined forces to "found a university where any person can find instruction in any study," Cornell has been at the forefront of higher education in embracing students, faculty, and staff of both genders and of all backgrounds and ethnicities. To read more and view important links and other diversity resources, visit http://www.cornell.edu/diversity/.

Graduate School Code of Legislation
http://www.gradschool.cornell.edu/sites/default/files/field_file/Code%20Revisions_Final_May%202014.pdf

International Students and Scholars Office
http://www.isso.cornell.edu/

Complete List of Graduate School Forms
http://www.gradschool.cornell.edu/forms

Big Red Barn Calendar
http://www.gradschool.cornell.edu/life-cornell/big-red-barn

Graduate & Professional Student Organization
http://www.assembly.cornell.edu/index.php?n=GPSA.Home

Graduate Community Initiative
http://assembly.cornell.edu/GraduateCommunityInitiative/Home
MPS Student Quick-Start Guide

Pre-program preparation

- Attend all scheduled orientation sessions
- Review course offerings and begin to **outline an academic plan**
- Identify independent study or internship opportunities (include in academic plan if obtaining course credit)
- Register for Semester 1 courses

BEFORE classes start

- Meet with advisor
  - Submit on-line committee/advisor selection form naming the major advisor
  - Review course selection
  - Determine credit hours for FDSC 5000, MPS Project
  - Review academic plan to ensure it meets all requirements
  - Schedule monthly advisor meetings (if possible to pre-schedule)

Semester 1, Week 2

- Last day to Add/Change Credits
- Finalize Academic Plan
- Meet with advisor to sign academic plan
  - Submit academic plan to Graduate Field Coordinator
  - Begin discussion of MPS project selection

Semester 1, Week 6

- Meet with advisor
  - Discussion of MPS project
  - Discuss dropping courses (if applicable)

Semester 1, Week 7

- Last day to Drop/Change Grading Basis

Semester 1, Week 8

- Course pre-enrollment begins for grad students
MPS Degree Frequently Asked Questions

Q: What if a student does not have at least 24 credits in classes numbered 4000 and above?
A: The student should submit a petition to Erin Atkins (ea56@cornell.edu) at the Graduate Field Office to be filed with CALS Registrar. The petition should include the following information:
1. Number, and title of the course(s) that is under the 4000 level that he/she would like counted towards his/her degree program.
2. A clear explanation of why this course(s) should be counted towards the MPS degree (for example, student does not have a food science background and therefore had to take undergraduate level food sciences courses to gain a general understanding of food science).

Q: How can credits earned outside of the MPS program be counted towards the MPS degree?
A: If the student has taken classes elsewhere but are not credits earned during his/her bachelor degree program, up to six of these credits can be transferred to the students MPS degree program. The student needs to provide Erin Atkins with a transcript giving the number, title and grade earned in the course(s) for transfer consideration, for submission to CALS Registrar.

Q: What if the student falls below the required 2.5 minimum GPA requirement?
A: The student will need to take additional courses to raise the overall GPA to at least a 2.5. If this is not feasible or if the student is not successful in doing so, the student will have to withdraw from the program.

Q: How does a student earn credits in FDSC 5000?
A: The credits earned under FDSC 5000 are for progress of the MPS project report. Students have the option to enroll in up to six credits each semester under FDSC 5000 (only 6 credits of FDSC 5000 may be counted towards the MPS credit requirements, however).

Q: Can an MPS student earn credits for doing research or independent study?
A: An MPS student has the option to earn research and or independent study credits under FDSC 6970, Graduate Individual Study, as long as the worked being done is something other than work being done for the student’s MPS project. For instance, if a student is performing research that will not be used in his/her MPS project, the student can enroll in 1-6 credits of individual study credits. If the work is being done specifically for the MPS project, the student should enroll in FDSC 5000.

Q: Are MPS students required to give a seminar?
A: No, there is no seminar requirement for MPS students.

Q: Are MPS students required to TA at least one semester?
A: No, however, they can TA and earn credits under FDSC 6980, Graduate Teaching Experience.

Q: Are MPS students required to give a final exam?
A: No, there are not required exams for MPS students.

Q: Are MPS students required to attend FDSC 6000, Graduate Seminar, every semester?
A: Yes, all graduate students, including MPS students, are required to attend seminar each semester.