Food Science

Food Science is the study of scientific and technological principles applied to the processing, preservation, packaging, distribution, handling, storage and evaluation of food products. It is an applied science, drawing heavily upon the principles of chemistry, engineering and microbiology. Research-based MSc and PhD thesis programs have existed in the Department of Food Science since its creation from the Department of Dairy Science in 1967 and are offered in the fields of:

- Food Chemistry
- Food Processing
- Food Microbiology

The Food Science program at Guelph is the only one of its kind in Ontario and over the years has trained a large percentage of the Food Scientists currently employed in the Ontario food industry. In 1992, a course-based MSc in Food Safety and Quality Assurance was developed by Food Science with several other departments at the University of Guelph. In 2010, a Graduate Diploma in Food Safety and Quality Assurance was introduced. The diploma is available only online. For more details please consult the FSQA program (calendar.uoguelph.ca/graduate-calendar/graduate-programs/food-safety-quality-assurance/).

Administrative Staff

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Graduate Faculty

This list may include Regular Graduate Faculty, Associated Graduate Faculty and/or Graduate Faculty from other universities.

Shai Barbut
B.Sc. Hebrew (Jerusalem), MS, PhD UW Madison - Professor
Graduate Faculty

Ben Bohrer
B.Sc., M.Sc. Ohio, PhD Illinois - Assistant Professor
Associated Graduate Faculty

Maria Corradini
B.Tech. Argentina, M.Sc., PhD MIT - Associate Professor
Graduate Faculty

Lisa Duizer
B.Sc., M.Sc. Guelph, PhD Massey - Associate Professor and Chair
Graduate Faculty

H. Douglas Goff
B.Sc. (Agr) Guelph, MS, PhD Cornell - Professor
Graduate Faculty

Lawrence Goodridge
B.Sc., M.Sc., PhD Guelph - Professor
Graduate Faculty

Arthur R. Hill
B.Sc., M.Sc., PhD Guelph - Professor
Graduate Faculty

Iris Joye
M.Sc. Leuven, PhD Leuven/Ghent (Belgium) - Associate Professor
Graduate Faculty

Gisele LaPointe
B.Sc.,PEI, M.Sc., PhD Quebec - Professor
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Loong-Tak Lim
B.Sc. Acadia, PhD Guelph - Professor
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Graduate Faculty

Paul Spagnuolo
B.Sc., M.Sc. Guelph, PhD Waterloo - Associate Professor
Graduate Faculty

Keith Warriner
B.Sc. Nottingham, PhD Aberystwyth - Professor
Graduate Faculty

MSc Program

The objective of this program is to provide graduates with general scientific knowledge as well as a more in-depth understanding of particular aspects of Food Science. The MSc program is offered in the fields of:

1. food chemistry;
2. food processing; and
3. food microbiology.

This objective is accomplished through course work and departmental research seminars. Extensive laboratory and technical training is obtained by performing experiments under the supervision of a professor and advisory committee. A mandatory communication course also teaches effective oral and written communication. All these training aspects culminate through the writing of the MSc thesis. With this
background, MSc graduates will be qualified to obtain positions with responsibility in government and the research, development and production sectors of the food and beverage industry.

Admission Requirements
To be considered for admission, applicants should hold an honours baccalaureate degree with at least a 'B' average during the last two years of study. Supportive letters of reference are essential and should outline the applicant’s strengths and weaknesses. Students whose first language is not English require a TOEFL score of at least 89 (internet-based) or IELTS score of at least 6.5. To assist in identifying a suitable thesis advisor, applicants should submit a short statement of research interests. Admission into the department is contingent on the student obtaining a scholarship or Graduate Research Assistantship. Students may be admitted into the Fall, Winter or Summer semesters.

Program Requirements
MSc students are required to register in at least three graduate courses, plus seminar (a minimum of 2.0 credits) and prepare an acceptable thesis. A graduate degree program form signed by the student and approved by the student’s advisory committee will be submitted during the first semester for approval of the departmental Graduate Program Committee. The student must maintain a minimum ‘B-‘ average to remain in the program. Each student is required to take a compulsory seminar course which provides training in technical communications. The thesis research is planned by the student in consultation with the advisor and approved by the advisory committee during the first semester of the program. The program is completed by the successful defense of the thesis.

PhD Program
The objective of this program is to develop highly competent scientists who will provide leadership in academic institutions, or as managers in Food Science research and development institutes in industry or government. The PhD program is offered in the fields of:

1. food chemistry;
2. food processing; and
3. food microbiology.

Creativity and the ability to perform independent research is fostered by requiring PhD students to submit a written research proposal and defend it orally. Having obtained research skills during their MSc studies, PhD students are expected to conduct autonomous research. The preparation of a PhD thesis and scientific publications ensures that graduates have attained prowess in research and communication.

Admission Requirements
The usual requirement for admission into the PhD program is a research-based MSc degree with a minimum 'B' average and supportive letters of reference. Students whose first language is not English require a TOEFL score of at least 89 (internet-based) or IELTS score of at least 6.5.

To assist in identifying a suitable thesis advisor, applicants should submit a short statement of research interests. Admission into the department is contingent on the student obtaining a scholarship or GRA. It is also possible for a student to transfer from the MSc program without completing a master's thesis if the student has an excellent academic record and shows a strong aptitude for research which can be expanded to the doctoral level. Students may be admitted into the Fall, Winter or Summer semesters.

Program Requirements
The major emphasis in the PhD program is research and the preparation of an acceptable thesis. There are no specific course requirements except for a course which is designed to ensure that the PhD candidates have adequate background knowledge in Food Science (food chemistry, food microbiology and food processing/engineering), as well as adequate written and oral communication skills. It is usual however for most students, in consultation with their advisory committee, to select prescribed studies and additional courses in preparation for the qualifying examination and thesis research. The qualifying examination is in two parts:

1. submission of research proposal; and
2. oral examination that evaluates the student’s ability to communicate effectively the scientific principles and put the proposed research to submit a written evaluation of the student’s performance to date in research and the student’s potential as a researcher.

The PhD program is completed by the submission and successful defense of an acceptable thesis.

Collaborative Specializations
One Health
The Department of Food Science participates in the collaborative specialization in One Health. Master’s and Doctoral students wishing to undertake thesis research or their major research paper/project with an emphasis on one health are eligible to apply to register concurrently in Food Science and the collaborative specialization. Students should consult the One Health (calendar.uoguelph.ca/graduate-calendar/collaborative-specializations/one-health/) listing for more information.

Courses
Course content for “Special Topics” will vary according to the research interests of the faculty involved in offering the course.

FOOD*6000 Dairy Chemistry and Microbiology Fall Only [0.50]
This course introduces the science behind milk production and composition and covers topics including: the chemistry and physics of milk fats, caseins, whey proteins, lactose, minerals, and minor components; chemical analysis; nutritional and health aspects of dairy products; milk microbiology including endogenous lactic bacteria, spoilage and pathogenic microorganisms; and microbial analysis. Offering(s): Offered through Distance Education format only.
Department(s): Department of Food Science
Location(s): Guelph

FOOD*6010 Dairy Products and Processes Winter Only [0.50]
The course begins with the engineering principles and computations of unit operations involved in dairy processing, and then explores formulation and processing of different dairy products. Video tours, simulations, processing, safety and quality control data and analysis are used to provide practical training.
Prerequisite(s): FOOD*6000
Department(s): Department of Food Science
Location(s): Guelph
This capstone course is intended to give participants the opportunity to apply what they have learned in a realistic industrial scenario. Students prepare a technical report in the form of a case study that identifies and characterizes a food industry problem and describes and assesses ways to solve it. Proposals are based on literature reviews, concepts learned during the program, and discussions with academic and industry advisors.

**Prerequisite(s):** FARE*6120, FARE*6130, FOOD*6000, FOOD*6010, FSQA*6600

**Department(s):** Department of Food Science

**Location(s):** Guelph

This course provides experiential training in forms of communication that are likely to be required in professional or academic careers in food science and technology.

**Restriction(s):** Restricted to Food Science students.

**Department(s):** Department of Food Science

**Location(s):** Guelph

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food chemistry. Students will complete an independent review in the area of food chemistry, participate in discussions, complete case studies, and present talks related to food chemistry.

**Department(s):** Department of Food Science

**Location(s):** Guelph

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food microbiology. Students will complete an independent review in the area of food microbiology, participate in discussions, complete case studies, and present talks related to food microbiology.

**Department(s):** Department of Food Science

**Location(s):** Guelph

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food physics. Students will complete an independent review in the area of food physics, participate in discussions, complete case studies, and present talks related to physics in foods.

**Department(s):** Department of Food Science

**Location(s):** Guelph

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food processing. Students will complete an independent review in the area of food processing, participate in discussions, complete case studies, and present talks related to conventional and emerging methodologies for the processing of foods.

**Department(s):** Department of Food Science

**Location(s):** Guelph

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food for health. Students will complete an independent review in the area of food and health, participate in discussions, complete case studies, and present talks related to the impact of food for health.

**Department(s):** Department of Food Science

**Location(s):** Guelph

This is a modular course in which several faculty members lecture and/or lead discussions in current topics in food quality. Students will complete an independent review in the area of food quality, participate in discussions, complete case studies, and present talks related to quality of foods.

**Department(s):** Department of Food Science

**Location(s):** Guelph

**Code** | **Title** | **Credits**
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HHNS*6410 | Applied Functional Foods and Nutraceuticals | 1.00
PLNT*6110 | Fruit and Vegetable Technology | 0.50
HHNS*6400 | Functional Foods and Nutraceuticals | 0.50