

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.

The Department of Food Science also offers a course-based MSc and Graduate Diploma in Food Safety and Quality Assurance (<https://calendar.uoguelph.ca/graduate-calendar/graduate-programs/food-safety-quality-assurance/#text>), as well as a Master of Dairy Technology Management (<https://calendar.uoguelph.ca/graduate-calendar/graduate-programs/dairy-technology-management/#text>) in collaboration with the Department of Food, Resource and Agricultural Economics (FARE).

Administrative Staff

Chair

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Graduate Faculty

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

Sampathkumar Balamurugan

M.Sc. Tamil Nadu, M.Sc., PhD Saskatchewan - Research Scientist,
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Associated Graduate Faculty

Shai Barbut

B.Sc. Hebrew (Jerusalem), MS, PhD UW Madison - Professor Emeritus

Shu Chen

B.Sc. Jiangnan, M.Sc., PhD Toronto - Senior Research Manager,
Laboratory Services Division, University of Guelph
Associated Graduate Faculty

Maria Corradini

B.Tech. Argentina, M.Sc., PhD Massachusetts-Amherst - Associate
Professor
Graduate Faculty

Wuwei Steve Cui

B.Sc. Peking, M.Sc. Jiangnan, PhD Manitoba - Senior Research Scientist,
Agriculture and Agri-Food Canada
Associated Graduate Faculty

Lisa Duizer

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

H. Douglas Goff

B.Sc. Guelph, MS, PhD Cornell - Professor Emeritus, Food Science,
University of Guelph
Associated Graduate Faculty

Lawrence Goodridge

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

Iris Joye

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

Biniam Kebede

B.Sc. M.Sc. PhD KU Leuven - Assistant Professor
Graduate Faculty

Chrystal Landgraaf

B.Sc., PhD Manitoba - Biologist, National Microbiology Laboratory, Public
Health Agency of Canada
Associated Graduate Faculty

Gisele LaPointe

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Alejandro G. Marangoni

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Alice Marciniak

B.Sc., M.Sc. Lille (France), PhD Laval - Assistant Professor
Graduate Faculty

Massimo F. Marcone

B.Sc., PhD Guelph - Professor Emeritus
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B.Sc., M.Sc. Shinshu, PhD Tokyo - Professor Emeritus
Associated Graduate Faculty

Michael Rogers

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

Paul Spagnuolo

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

Keith Warriner

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

MSc Program

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. Each applicant must obtain the support of a faculty member willing to serve as their advisor *before* applying to the program. Students may be admitted into the Fall, Winter or Summer semesters.

Program Requirements

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. 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.

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 second semester of the program. The program is completed by the successful defense of the thesis.

PhD Program

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.

Each applicant must obtain the support of a faculty member willing to serve as their advisor *before* applying to the program. 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 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. 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.

The major emphasis in the PhD program is research and the preparation of an acceptable thesis. Each student is required to take a compulsory seminar course FOOD*6300 which provides training in technical communications. 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 a written research proposal; and
2. oral examination that evaluates the student's ability to communicate effectively the scientific principles, the proposed 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 (<https://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

FOOD*6020 Dairy Technology Management Project Summer Only [0.50]

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

FOOD*6190 Advances in Food Science Unspecified [0.50]

Topics of current research interest and importance are examined. A project supervised by a faculty member is undertaken, the topic of which is chosen after considering the interests of the student.

Department(s): Department of Food Science

Location(s): Guelph

FOOD*6300 Food Science Communication Unspecified [0.50]

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

FOOD*6710 Advances in Food Chemistry Fall Only [0.50]

This course is jointly taught by faculty who specialize in various areas of food chemistry. Each instructor provides lectures on their respective areas of expertise. Throughout the course, students complete independent reviews of a chosen area of food chemistry, deliver presentations, engage in discussions and solve case studies.

Department(s): Department of Food Science

Location(s): Guelph

FOOD*6720 Advances in Food Microbiology Winter Only [0.50]

This course is jointly taught by faculty who specialize in the area of food microbiology. Each instructor provides lectures on their respective areas of expertise. Throughout the course, students will complete independent reviews of a chosen area of food microbiology, deliver presentations, engage in discussions and solve case studies.

Department(s): Department of Food Science

Location(s): Guelph

FOOD*6730 Advances in Food Physics Fall Only [0.50]

This course is jointly taught by faculty who specialize in the area of food physics. Each instructor provides lectures on their respective areas of expertise. Throughout the course, students will complete independent reviews of a chosen area of food physics, deliver presentations, engage in discussions and solve case studies.

Department(s): Department of Food Science

Location(s): Guelph

FOOD*6740 Advances in Food Processing Unspecified [0.50]

This course is jointly taught by faculty who specialize in the area of food processing. Each instructor provides lectures on their respective areas of expertise. Throughout the course, students will complete independent reviews of a chosen area of food processing, deliver presentations, engage in discussions and solve case studies.

Department(s): Department of Food Science

Location(s): Guelph

FOOD*6750 Special Topics in Food for Health Unspecified [0.25]

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

FOOD*6760 Special Topics in Food Quality Unspecified [0.25]

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

FOOD*6770 PhD Research Writing in Food Science Fall and Winter [0.50]

PhD Research Writing in Food Science provides experiential training in forms of communication that are likely to be required in professional or academic careers, helps PhD students position their research in the broader context of Food Science and Technology, and helps prepare students for the qualifying examination.

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

Department(s): Department of Food Science

Location(s): Guelph

Other Graduate Courses

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