2017-2018 Graduate Calendar

The information published in this Graduate Calendar outlines the rules, regulations, curricula, programs and fees for the 2017-2018 academic years, including the Summer Semester 2017, Fall Semester 2017 and the Winter Semester 2018.

For your convenience the Graduate Calendar is available in PDF format.

If you wish to link to the Graduate Calendar please refer to the Linking Guidelines.

The University is a full member of:

• The Association of Universities and Colleges of Canada

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Revision Information:

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<tr>
<th>Date</th>
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<tr>
<td>May 5, 2017</td>
<td>Initial Publication</td>
</tr>
<tr>
<td>June 19, 2017</td>
<td>Revision 1</td>
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Disclaimer
The Office of Graduate Studies has attempted to ensure the accuracy of this on-line Graduate Calendar. However, the publication of information in this document does not bind the university to the provision of courses, programs, schedules of studies, fees, or facilities as listed herein.

Limitations
The University of Guelph reserves the right to change without notice any information contained in this calendar, including any rule or regulation pertaining to the standards for admission to, the requirements for the continuation of study in, and the requirements for the granting of degrees or diplomas in any or all of its programs.

The university will not be liable for any interruption in, or cancellation of, any academic activities as set forth in this calendar and related information where such interruption is caused by fire, strike, lock-out, inability to procure materials or trades, restrictive laws or governmental regulations, actions taken by the faculty, staff or students of the university or by others, civil unrest or disobedience, Public Health Emergencies, or any other cause of any kind beyond the reasonable control of the university.

The University of Guelph reaffirms section 1 of the Ontario Human Rights Code, 1981, which prohibits discrimination on the grounds of race, ancestry, place of origin, colour, ethnic origin, citizenship, creed, sex, sexual orientation, handicap, age, marital status or family status.

The university encourages applications from women, aboriginal peoples, visible minorities, persons with disabilities, and members of other under-represented groups.
Introduction

Collection, Use and Disclosure of Personal Information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) [http://www.e-laws.gov.on.ca/DBLaws/Statutes/English/90f31_e.htm]. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes. Certain personal information is disclosed to external agencies, including the Ontario Universities Application Centre, the Ministry of Training, Colleges and Universities, and Statistics Canada, for statistical and planning purposes, and is disclosed to other individuals or organizations in accordance with the Office of Registrarial Services Departmental Policy on the Release of Student Information. For details on the use and disclosure of this information call the Office of Registrarial Services at the University at (519) 824-4120 or see [https://www.uoguelph.ca/registrar/](https://www.uoguelph.ca/registrar/)

Statistics Canada - Notification of Disclosure

For further information, please see Statistics Canada's web site at [http://www.statcan.gc.ca](http://www.statcan.gc.ca) and Section XIV Statistics Canada.

Address for University Communication

Depending on the nature and timing of the communication, the University may use one of these addresses to communicate with students. Students are, therefore, responsible for checking all of the following on a regular basis:

Email Address

The University issued email address is considered an official means of communication with the student and will be used for correspondence from the University. Students are responsible for monitoring their University-issued email account regularly.

Home Address

Students are responsible for maintaining a current mailing address with the University. Address changes can be made, in writing, through the Office of Graduate Studies.

Name Changes

The University of Guelph is committed to the integrity of its student records, therefore, each student is required to provide either on application for admission or on personal data forms required for registration, his/her complete, legal name. Any requests to change a name, by means of alteration, deletion, substitution or addition, must be accompanied by appropriate supporting documentation.

Student Confidentiality and Release of Student Information Policy Excerpt

The University undertakes to protect the privacy of each student and the confidentiality of his or her record. To this end the University shall refuse to disclose personal information to any person other than the individual to whom the information relates where disclosure would constitute an unjustified invasion of the personal privacy of that person or of any other individual. All members of the University community must respect the confidential nature of the student information which they acquire in the course of their work.

Complete policy at [http://www.uoguelph.ca/policies](http://www.uoguelph.ca/policies).
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Animal Biosciences

In addition to a core group of faculty members the Department of Animal Biosciences works closely with professionals from the Ontario Ministry of Agriculture and Food (OMAF), Agriculture and Agri-Food Canada (AAFC), and other affiliated organizations. The graduate program encompasses MSc by course-work, MSc by thesis, and PhD options in four main fields:

- Animal Breeding and Genetics (quantitative or molecular)
- Animal Nutrition (monogastric or ruminant)
- Animal Physiology (environmental and reproductive)
- Animal Behaviour and Welfare

Administrative Staff

Chair
James Squires (223 ANNU, Ext. 53928)
jsquires@uoguelph.ca

Graduate Program Coordinator
Georgia Mason (138 ANNU, Ext. 56804)
agsc@uoguelph.ca

Graduate Program Assistant
Wendy McGrattan (144 ANNU, Ext. 56215)
wmcgratt@uoguelph.ca

Graduate Faculty

*Please see the Department's webpage at www.aps.uoguelph.ca for an updated listing of faculty.

Christine Baes
BSc Guelph, MSc Hohenheim, PhD Christina-Albrechts - Assistant Professor

Gregory Bedecarrats
Licence de Biochimie, MSc, Dipl. Rennes (France), PhD McGill - Associate Professor

Dominique P. Bureau
BSc (Agr), MSc Laval, PhD Guelph - Professor

Angela Canovas
BSc Lledia, MSc Valencia, PhD Lledia - Assistant Professor

John P. Cant
BSc (Agr) Nova Scotia, MS, PhD California - Professor

Abigail Carpenter
BS Michigan, MS Minnesota, PhD Kansas State - Assistant Professor

Trevor Devries
BSc, PhD British Columbia - Associate Professor

Ming Z. Fan
BS Xinjiang, MS Harbin, PhD Alberta - Professor

James France
BSc Cardiff, MSc, PhD, DSc Hull (United Kingdom), CMath, CSci, FIMA - Professor and Senior Canada Research Chair

Alexandra Harlander
DVM, DVSc Vienna, Ph.D. Germany - Assistant Professor

Niel A. Karrow
BSc Guelph, MSc, PhD Waterloo - Associate Professor

Elijah Kiarie
BSc, MSc Nairobi, PhD Manitoba - Assistant Professor

Julang Li
MSc Changchun Veterinary College (China), PhD Ottawa - Professor

Ira B. Mandell
BS, MS Ohio State, PhD Saskatchewan - Associate Professor

Georgia Mason
BA, PhD Cambridge - Professor

Katriona Merkies
BSc, PhD Guelph - Associate Professor

Richard D. Moccia
BSc, MSc Guelph - Professor

Vern R. Osborne
BSc, MSc, PhD Guelph - Associate Professor

Wendy Pearson
BSc, MSc, PhD Guelph - Assistant Professor

Eduardo Ribeiro
DVM Santa Catarina State, MSc, PhD Florida - Assistant Professor

J. Andrew B. Robinson
BSc (Agr), MSc Guelph, PhD Cornell - Associate Professor

Flavio S. Schenkel
BBA, BSc, and MSc Brazil, PhD Guelph - Professor

Anna Kate Shoveller
BSc Guelph, PhD Alberta - Assistant Professor

E. James Squires
BSc, MSc, PhD Memorial - Professor and Interim Chair

Tina M. Widowski
BS, MS, PhD Illinois - Professor

Katie Wood
BSc, MSc, PhD Guelph - Assistant Professor

MSc Program

The MSc program involves advanced courses and the completion of a research project. These are means of developing the skills and intellectual curiosity that may further qualify the student for a leadership role within animal organizations and industries or serve as a prerequisite for doctoral studies. The MSc degree may be completed via two routes: by thesis or by coursework and major paper. The MSc by coursework and major paper is offered in four areas of specialization: 1) animal breeding and genetics, 2) animal nutrition, 3) animal behaviour and welfare and 4) animal physiology.

Admission Requirements

An honours baccalaureate, with a minimum average grade of ‘B’ during the last 2 years of full-time equivalent study. For Canadian degrees, we interpret this as the last 20 semester courses, however we do not split a semester and we will not consider any fewer than 16 courses.

Degree Requirements

Students enrol in one of two study options: 1) thesis, or 2) course work and major research paper.

Thesis

Candidates for the thesis-based MSc degree must successfully complete a prescribed series of courses, conduct a research project, prepare a thesis based on their results and defend this in a final examination. The number of course credits required in this option will be decided by the student's advisory committee in consultation with the student, and may exceed the minimum 1.5 credits required by the Faculty of Graduate Studies. Generally, 4 or 5 courses (1.5-2.0 credits) will be taken, including the mandatory Seminar course, ANSC*6600 and ANSC*6610 (0.25 credits each).

Course Work and Major Research Paper (MRP)

Candidates for the MSc degree by course work and major paper option must complete a minimum of 4.0 credits (9 courses). Of these courses, one will be the departmental Seminar course, ANSC*6600 (0.25 credit), and another will be Major Paper in Animal and Poultry Science, ANSC*6900 (1.0 credit). The major paper will be a detailed, critical review of an area of study related to the specialization chosen by the student and should include analyses and interpretations of relevant data. The content of the major paper will be presented to the department in the Seminar course.

At the beginning of the program, the student and student's advisory committee will design the coursework program according to the program guidelines and the aspirations and background of the student. Students will normally choose a minimum of 4 courses in the area of specialization, and a minimum of two courses outside the area of specialization. These latter courses can be offered by departments other than Animal Biosciences.

A maximum of one approved senior-level undergraduate course can be included in the list of prescribed courses. Recommended graduate courses in the three areas of specialization are as follows:

- Animal Breeding and Genetics
  - ANSC*6900 [1.00] Major Paper in Animal and Poultry Science
  - ANSC*6210 [0.50] Principles of Selection in Animal Breeding
  - ANSC*6370 [0.50] Quantitative Genetics and Animal Models
  - ANSC*6390 [0.50] QTL and Markers
  - ANSC*6450 [0.50] Topics in Animal Biotechnology

- Animal Nutrition and Metabolism
  - ANSC*6900 [1.00] Major Paper in Animal and Poultry Science
  - ANSC*6610 [0.50] Topics in Comparative Animal Nutrition
  - ANSC*6620 [0.50] Poultry and Swine Nutrition
  - ANSC*6630 [0.50] Modelling Metabolic Processes
  - ANSC*6530 [0.50] Techniques in Animal Nutrition Research
  - ANSC*6450 [0.50] Topics in Animal Biotechnology
  - ANSC*6460 [0.50] Lactation Biology
  - ANSC*6470 [0.50] Advanced Animal Nutrition and Metabolism I
  - ANSC*6480 [0.50] Advanced Animal Nutrition and Metabolism II

- Animal Behaviour and Welfare
  - ANSC*6900 [1.00] Major Paper in Animal and Poultry Science
  - ANSC*6440 [0.50] Advanced Critical Analysis in Applied Ethology
  - ANSC*6700 [0.50] Animals in Society: Historical and Global Perspectives on Animal Welfare
  - ANSC*6710 [0.50] Assessing Animal Welfare in Practice
  - ANSC*6720 [0.50] Scientific Assessment of Affective States in Animals
  - ANSC*6730 [0.50] Applied Environmental Physiology and Animal Housing
  - ANSC*6740 [0.50] Special Topics in Applied Animal Welfare Science
  - UNIV*6030 [0.50] Seminars and Analysis in Animal Behaviour and Welfare

UNIV 39
Animal Breeding and Genetics

**ANSC*6210 Principles of Selection in Animal Breeding W [0.50]**
Definition of selection goals, prediction of genetic progress and breeding values, and the comparison of selection programs.
*Department(s):* Department of Animal Biosciences

**ANSC*6240 Topics in Animal Genetics and Genomics F [0.50]**
Current literature and classical papers pertaining to quantitative genetics, animal breeding and animal genomics are reviewed in detail through presentation, discussion and critical analysis.
*Department(s):* Department of Animal Biosciences

**ANSC*6370 Quantitative Genetics and Animal Models F [0.50]**
The course covers quantitative genetics theory associated with animal models; linear models applied to genetic evaluation of animals; estimation of genetic parameters for animal models; and computing algorithms for large datasets.
*Department(s):* Department of Animal Biosciences

**ANSC*6390 QTL and Markers W [0.50]**
Advanced training in QTL mapping and selection assisted by genetic markers.
*Department(s):* Department of Animal Biosciences

**ANSC*6450 Topics in Animal Biotechnology W [0.50]**
The course will explore current methods and recent advances of biotechnology, innovation, and emerging translational products of significance to animal production and human health. Next offering Fall 2017.
*Department(s):* Department of Animal Biosciences

Animal Nutrition

**ANSC*6010 Topics in Comparative Animal Nutrition F [0.50]**
Current topics in the feeding and nutrition of agricultural, companion and captive animal species. Emphasis is placed on the influence of nutrients on metabolic integration at tissue, organ and whole-animal levels. A nutritional case study will be conducted to allow students to solve practical feeding problems by applying basic nutritional principles. The course is offered every other year on even years.
*Department(s):* Department of Animal Sciences

**ANSC*6020 Poultry and Swine Nutrition W [0.50]**
A discussion of current topics in the feeding and nutrition of domestic fowl and swine based on the critical appraisal of selected journal readings.
*Department(s):* Department of Animal Biosciences

**ANSC*6030 Modelling Metabolic Processes F [0.50]**
Building and testing of mathematical models of metabolic processes using continuous simulation software to assist in weekly assignments. Choice of model based on students' research interests (e.g. protein synthesis, nutrient uptake, rumen fermentation). Term project to reproduce model from scientific knowledge.
*Department(s):* Department of Animal Biosciences

**ANSC*6360 Techniques in Animal Nutrition Research W [0.50]**
Theory and/or techniques of methods to evaluate feedstuffs and determine nutrient utilization in poultry, swine and ruminants is covered through lectures, short laboratories and a major project.
*Department(s):* Department of Animal Biosciences

**ANSC*6470 Advanced Animal Nutrition and Metabolism I F [0.50]**
A systematic review of key aspects of energy, protein, amino acid and carbohydrate utilization and metabolism in farm animals.
*Department(s):* Department of Animal Biosciences

**ANSC*6480 Advanced Animal Nutrition and Metabolism II W [0.50]**
A systematic review of key aspects of lipid, vitamin and mineral utilization and metabolism in farm animals.
*Department(s):* Department of Animal Biosciences

Animal Physiology

**ANSC*6400 Mammalian Reproduction W [0.50]**
Discussions and applications of methodology for collection and examination of gametes and embryos and for measurements of hormones in biological fluids.
*Offering(s):* Offered in odd-numbered years.
*Department(s):* Department of Animal Biosciences

**ANSC*6460 Lactation Biology F [0.50]**
An in-depth systems analysis of lactation, comparing the cow, pig, rat, human and seal. Mammary development from conception through to lactogenesis, lactation and involution will be covered. Hypotheses of regulation of the biochemical pathways of milk synthesis will be tested in relation to experimental observations.
*Department(s):* Department of Animal Biosciences

**ANSC*6250 Growth and Metabolism W [0.50]**
Animal growth and metabolism are considered at the cellular level in a manner that extends beyond the basic disciplines of biometrics and biochemistry with attention focused on the main carcass components — muscle, fat and bone.
*Department(s):* Department of Animal Biosciences

Animal Behaviour and Welfare

**ANSC*6440 Advanced Critical Analysis in Applied Ethology F [0.50]**
Students explore the process of scientific inquiry and experimental design within the context of applied ethology research. Discussions include the peer review process, critical analyses and applications of methods for applied animal behaviour research.
*Department(s):* Department of Animal Biosciences

**ANSC*6700 Animals in Society: Historical and Global Perspectives on Animal Welfare F [0.50]**
A seminar course covering society's duties to animals. Students will learn about the major ethical theories that deal with society's duties towards animals, the main scientific approaches to animal welfare, and the relationship of science to ethics. A brief history of human-animal relationships will be covered and cultural differences described. Students will use this to analyze some current issues.
*Department(s):* Department of Animal Biosciences
### IX. Graduate Programs, Animal Biosciences

**ANSC*6710 Assessing Animal Welfare in Practice**

A lecture/seminar course covering the principles of applied animal welfare assessment. Students will learn what influences an animal welfare assessment and will understand the components necessary to create an effective and targeted animal welfare program for industry or regulatory application.

**Offering(s):** Winter offering on-campus, Summer offering Distance Education.

**Prerequisite(s):** ANSC*6700

**Department(s):** Department of Animal Biosciences

**ANSC*6700 Scientific Communication I**

This course is required for successful completion of a MSc degree. Via reading, guest lectures, online modules and in-class discussion, students will learn about the principles of effective communication, and with training and feedback, create a departmental webpage and oral presentation outlining their research plans.

**Prerequisite(s):** ANSC*6600

**Restriction(s):** Restricted to Animal Biosciences PhD students.

**Department(s):** Department of Animal Biosciences

**ANSC*6730 Applied Environmental Physiology and Animal Housing**

A lecture/seminar course covering the principles of applied environmental physiology including temperature regulation, space requirements, animal responses to light and other aspects of the physical environment. Students pursue a topic in depth to develop or update recommended codes of practice and resource-based standards.

**Department(s):** Department of Animal Biosciences

**ANSC*6720 Scientific Assessment of Affective States in Animals**

Graduate students will explore the biology and validity of behavioural and physiological techniques used in animal welfare assessment of such phenomena as: sympathetic activation, HPA functioning, stereotypic behaviour and preference responses. A combination of lecture, instructor-led discussion and student-led discussion will explore these areas of animal welfare assessment.

**Department(s):** Department of Animal Biosciences

**ANSC*6740 Special Topics in Applied Animal Welfare Science**

This course is required for completion of a PhD degree. Via reading, guest lectures, online modules and in-class discussion, students will learn about the principles of effective communication, and with training and feedback, create a departmental webpage and oral presentation outlining their research plans.

**Prerequisite(s):** ANSC*6610

**Restriction(s):** Restricted to Animal Biosciences PhD students.

**Department(s):** Department of Animal Biosciences

**ANSC*6900 Major Paper in Animal and Poultry Science**

A detailed, critical review of an area of study related to the specialization of students in the MSc by course work and major paper option that includes analysis and interpretation of relevant data.

**Department(s):** Department of Animal Biosciences

**UNIV*6030 Seminars and Analysis in Animal Behaviour and Welfare**

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<th>Course Code</th>
<th>Title</th>
<th>Offerings</th>
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<tr>
<td>ANSC*6500 Biometry for Animal Sciences</td>
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<td>ANSC*6600 Special Project</td>
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<td>ANSC*6690 Advanced Dairy Management</td>
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<tr>
<td>ANSC*6600 Scientific Communication I</td>
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<tr>
<td>ANSC*6610 Thesis Proposal and Professional Development I</td>
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For students involved in animal research. The course will provide outlines of appropriate presentation and analysis of experimental data with emphasis on different analytical techniques.

**Department(s):** Department of Animal Biosciences

Supervised program of study in some aspect of animal and poultry science that can involve an experimental project and/or detailed analysis of the literature.

**Department(s):** Department of Animal Biosciences

A comprehensive systems science and integrative capstone course that encompasses the “closing of the loop” education of dairy production systems. Students will be exposed to real-time issues relating to dairy production from, environment, economics, nutrition, housing, health, welfare, society and agrology. This course will allow the student to practice their training from the courses they have been exposed to as undergraduates into many case study evaluations on farms provincially, nationally and internationally.

**Restriction(s):** Instructor consent required.

**Department(s):** Department of Animal Biosciences

This course is required for completion of a thesis-based MSc degree. Via reading, guest lectures, online modules and in-class discussion, students will learn about the principles of effective communication, and with training and feedback create a departmental webpage and oral presentation outlining their research plans.

**Restriction(s):** Restricted to Animal Biosciences students.

**Department(s):** Department of Animal Biosciences

This course is required for successful completion of an MSc thesis degree. With guidance and instruction, students complete a research proposal, or a literature review for their thesis. Students will also spend 8 hours on professional (e.g. via mygradskills.ca, MITAC Step workshops).

**Restriction(s):** Restricted to Animal Biosciences students.

**Department(s):** Department of Animal Biosciences