



# **ANSC\*3040 Animal Reproduction**

Winter 2020

Section(s): C01

Department of Animal Biosciences

Credit Weight: 0.50

Version 1.00 - January 02, 2020

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## **1 Course Details**

### **1.1 Calendar Description**

This course takes a multi-species approach to understanding the basic principles of animal reproduction. Both the anatomy and the physiology of reproductive systems are explored in agricultural, companion and wildlife species with an emphasis on animals under human management. In addition, the development and application of assisted reproductive technologies (ART) for animal management are introduced.

**Pre-Requisites:** ANSC\*3080

### **1.2 Course Description**

This course takes a multi-species approach to understanding the basic principles of reproduction in domestic animals. The developmental biology, the anatomy and the physiology of reproductive systems in ruminants, swine, equine, canine, feline, and birds are explored. In addition, the development and application of reproductive technologies for animal management are discussed.

### **1.3 Timetable**

Lectures: Mondays, Wednesdays, Fridays, 1:30 p.m. - 2:20 p.m., MACN 105.

Laboratories: Tuesdays or Thursdays, Room ANNU110 according to the following schedule:

- Section 1: Tuesdays 10:00 a.m. - 11:30 a.m.

- Section 2: Tuesdays 11:30 a.m. - 1:00 p.m.
- Section 3: Tuesdays 1:00 p.m. - 2:30 p.m.
- Section 4: Tuesdays 2:30 p.m. - 4:00 p.m.
- Section 5: Tuesdays 4:00 p.m. - 5:30 p.m.
- Section 6: Thursdays 10:00 a.m. - 11:30a.m.
- Section 7: Thursdays 11:30 a.m. - 1:00 p.m.
- Section 8: Thursdays 1:00 p.m. - 2:30 p.m.
- Section 9: Thursdays 2:30 p.m. - 4:00 p.m.
- Section 10: Thursdays 4:00 p.m. - 5:30 p.m

Timetable is subject to change. Please see WebAdvisor for the latest information.

## 1.4 Final Exam

April 18, 2019, 8:30am-10:30am - Room TBA

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

## 2 Instructional Support

### 2.1 Instructional Support Team

<b>Instructor:</b>	Eduardo Ribeiro
<b>Email:</b>	eribeiro@uoguelph.ca
<b>Telephone:</b>	+1-519-824-4120 x56516
<b>Office:</b>	ANNU 317
<b>Office Hours:</b>	TBA

<b>Lab Co-ordinator:</b>	Robert Jones
<b>Email:</b>	rjones12@uoguelph.ca
<b>Telephone:</b>	+1-519-824-4120 x56891
<b>Office:</b>	ANNU 255
<b>Office Hours:</b>	TBA

## 2.2 Teaching Assistants

<b>Teaching Assistant:</b>	Bruna Mion
<b>Email:</b>	bmion@uoguelph.ca
<b>Office:</b>	ANNU 110
<b>Office Hours:</b>	TBA
<b>Teaching Assistant:</b>	George Hall
<b>Email:</b>	ghall02@uoguelph.ca
<b>Office:</b>	ANNU 110
<b>Office Hours:</b>	TBA
<b>Teaching Assistant:</b>	Nicholas Werry
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<b>Office:</b>	ANNU 110
<b>Office Hours:</b>	TBA
<b>Teaching Assistant:</b>	Reem Sabry
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<b>Teaching Assistant:</b>	Tanka Khanal
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<b>Office:</b>	ANNU 110
<b>Office Hours:</b>	TBA
<b>Teaching Assistant:</b>	Lautaro Rostoll Cangiano
<b>Email:</b>	lrostoll@uoguelph.ca
<b>Office:</b>	ANNU 110
<b>Office Hours:</b>	TBA

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## 3 Learning Resources

### 3.1 Required Resources

#### Required Textbook (Textbook)

Pathways to Pregnancy and Parturition, 3rd Edition, Phillip L. Senger, Current Conceptions, Inc.

Available at University Bookstore; 519-824-4120 Ext. 56692.

## 3.2 Recommended Resources

### Recommended Texts (Textbook)

Additional recommended texts will be posted in the Courselink webpage of the course.

## 3.3 Additional Resources

### Lab Manual (Lab Manual)

Recommended texts for laboratory classes will be provided via Courselink.

### Other Resources (Other)

Any additional resources for the course will be provided via Courselink.

### Field Trips (Other)

No field trips are planned for this course.

## 3.4 Additional Costs:

Students must bring a lab coat for laboratory classes.

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# 4 Learning Outcomes

## 4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Specific Learning Outcomes:

By the end of this program, successful students will be able to:

1. Identify the main hormones regulating reproduction in domestic species and recall their biochemical classification, source of production, target tissues, and primary actions.
2. Illustrate and execute immunoassays for quantification of hormones in biological

samples.

3. Explain the mechanism of sexual differentiation in developing embryos and the organogenesis of the reproductive tract in females and males of domestic species.
4. Recognize and explain the organization and function of the reproductive system in females and males of domestic species.
5. Explain the process of gametogenesis in females and males of domestic species.
6. Explain the physiology of puberty in females and males of domestic species.
7. Explain methods of breeding soundness examination of sires and recognize the equipment and material required.
8. Describe the reproductive cycles in females of domestic species and explain how they are coordinated by the reproductive hormones.
9. Explain fertilization, early embryogenesis and maternal recognition of pregnancy.
10. Explain main events in placentation, endocrinology of pregnancy and parturition, and main events in puerperium and lactation.
11. Recognize different stages of embryonic/fetal development and describe the main methods of pregnancy diagnosis in domestic species.
12. Describe and compare reproductive technologies used in reproductive management of domestic species, and recognize the materials required for each technique.

## 5 Teaching and Learning Activities

### 5.1 Lecture Schedule

The schedule below is tentative in regards to the dates certain topics will be covered. This schedule can change at the instructor discretion.

<b>Lecture #</b>	<b>Date</b>	<b>Lecture topic</b>
Lecture 1	6-Jan	Introduction
Lecture 2	8-Jan	Embryogenesis and sexual differentiation
Lecture 3	10-Jan	Embryogenesis and sexual differentiation
Lecture 4	13-Jan	Functional anatomy of the male reproductive tract
Lecture 5	15-Jan	Functional anatomy of the male reproductive tract
Lecture 6 *	17-Jan	Puberty and endocrinology of the male
Lecture 7	20-Jan	Puberty and endocrinology of the male
Lecture 8	22-Jan	Spermatogenesis

<b>Lecture #</b>	<b>Date</b>	<b>Lecture topic</b>
Lecture 9	24-Jan	Sexual behaviour of the male
Lecture 10	27-Jan	Sire fertility
Lecture 11	29-Jan	Functional anatomy of the female reproductive system
Lecture 12 *	31-Jan	Functional anatomy of the female reproductive system
Lecture 13	3-Feb	Puberty and endocrinology of the female
Lecture 14	5-Feb	Puberty and endocrinology of the female
Lecture 15	7-Feb	Folliculogenesis and the estrous cycle
Lecture 16	10-Feb	Folliculogenesis and the estrous cycle
Lecture 17	12-Feb	Oogenesis
Lecture 18 *	14-Feb	Fertilization
---	18-Feb	<b>Winter break – no lecture</b>
---	20-Feb	<b>Winter break – no lecture</b>
---	22-Feb	<b>Winter break – no lecture</b>
Lecture 19	24-Feb	Early embryo development and maternal recognition of pregnancy
Lecture 20	26-Feb	Early embryo development and maternal recognition of pregnancy
Lecture 21	28 - Feb	Developmental biology and placentation
<b>Midterm exam</b>	<b>29 - Feb</b>	<b>Mid-term exam - Time and Room to be arranged</b>
Lecture 22	2-Mar	Developmental biology and placentation
Lecture 23	4-Mar	Endocrinology of pregnancy and parturition
Lecture 24 *	6-Mar	Puerperium and lactation
Lecture 25	9-Mar	Puerperium and lactation
Lecture 26	11-Mar	Applied reproductive physiology and technologies in ruminants
Lecture 27	13-Mar	Applied reproductive physiology and technologies in ruminants
Lecture 28	16-Mar	Applied reproductive physiology and technologies in ruminants
Lecture 29	18-Mar	Applied reproductive physiology and technologies in ruminants
Lecture 30 *	20-Mar	Applied reproductive physiology and technologies in ruminants
Lecture 31	23-Mar	Applied reproductive physiology and technologies in swine
Lecture 32	25-Mar	Applied reproductive physiology and technologies in the zoo
Lecture 33	27-Mar	Applied reproductive physiology and technologies in equine
Lecture 34	30-Mar	Reproduction of birds
Lecture 35	1-Apr	Reproduction of birds
Lecture 36 *	3-Apr	Reproduction of birds

Lecture #	Date	Lecture topic
<b>Final exam</b>	<b>18-Apr</b>	<b>Final exam from 8:30 to 10:30 - Room TBA</b>

*\* Represents a day of Quiz in classroom.*

## 5.2 Seminar

There is no seminar planned for this course.

## 5.3 Laboratory Classes

The schedule below is tentative in regards to the dates certain topics will be covered. This schedule can change at the instructor discretion.

Lab #	Date	Lab topic
---	Jan 7 & 9	No laboratory class – watch recorded lecture of endocrinology
Lab 1	Jan 14 & 16	Hormones and ELISA
Lab 2	Jan 21 & 23	Anatomy and histology of the male reproductive tract
Lab 3	Jan 28 & 30	Breeding soundness exam of sires
Lab 4	Feb 4 & 6	Anatomy and histology of the female reproductive tract
Lab 5	Feb 11 & 13	Ovaries, follicle aspiration, oocyte search, and introduction to IVF
---	<b>Feb 18 &amp; 20</b>	<b>Winter break – no laboratory class</b>
---	Feb 25 & 27	No laboratory class – break to study for the midterm
Lab 6	Mar 3 & 5	Anatomy of pregnant uteri and pregnancy diagnosis methods
Lab 7	Mar 10 & 12	Estrous detection, synchronization programs, artificial insemination
Lab 8	Mar 17 & 19	Practicing artificial insemination
Lab 9	Mar 24 & 26	Embryology, embryo flushing and embryo transfer procedures
Lab 10	Mar 31 & Apr 2	Birds reproduction

## 6 Assessments

### 6.1 Assessment Details

#### Course Assignments and Tests (0%)

Course Assignments and Tests:

<b>Assignment or Test</b>	<b>Date</b>	<b>Contribution to Final Mark (%)</b>	<b>Learning Outcomes Assessed</b>
Quiz 1	17-Jan	5.0*	1 – 4
Quiz 2	31-Jan	5.0*	5 – 7
Quiz 3	14-Feb	5.0*	5, 8
Mid-term exam	29 -Feb	37.5	1 – 9
Quiz 4	6-Mar	5.0*	9 – 11
Quiz 5	20-Mar	5.0*	10, 12
Quiz 6	3-Apr	5.0*	12
Final exam	18-Apr	37.5	1 – 12

Final examination date and time:

April 18, 2019. From 8:30 a.m. to 10:30 a.m.

Final exam weighting:

37.5%

## 6.2 Additional Notes

**\*The quiz with the lowest grade will be dropped for the calculation of the final grade for quizzes. Thus, only the best five of six quizzes count towards the final grade.**



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## 7 Course Statements

### 7.1 Grading Policies:

The final grade is divided in five parts:

- **25.0% Quizzes (100 points):** A quiz of short answer and multiple choice questions will be given at the start of the class when scheduled (Jan-17, Jan-31, Feb-14, Mar-6, Mar-20, Apr-3). The Courselink platform will be used, and students must bring an electronic device with internet connection to access the platform. Questions will be designed based on the content of the last 6 lectures and the last 2 laboratories, including online material posted on Courselink. No make-up quizzes will be granted. A missed lecture quiz results in a 0% score. The lowest score, or one missed quiz, will be dropped from the calculation of the final score for Quizzes. Each quiz worth 20 points. Students who missed two or more quizzes because of medical conditions must present official documentation for justification of absence and transfer of assigned points from a missed quiz to the final exam.
- **37.5% Midterm Exam (150 points):** Comprehensive exam with short answer and multiple choice questions scheduled for February 29th. Location and time will be informed in WebAdvisor/Courselink. Questions will be designed based on the content of lectures and laboratories given before the Winter break. No make-up exam will be granted. Students who missed the midterm exam because of a medical condition must present official documentation for justification of absence and transfer of assigned points from the missed midterm exam to the final exam. A missed exam without justification results in a 0% score.
- **37.5% Final Exam (150 points):** Comprehensive exam with short answer and multiple choice questions scheduled for April 18<sup>th</sup> from 8:30 a.m. to 10:30 a.m. Location will be informed in WebAdvisor/Courselink. Questions will be designed based on the content of all lectures and laboratories with emphasis on topics covered after the Winter break. No make-up exam unless approved prior to the exam, depending on instructor approval. A missed exam results in a 0% score.

## 7.2 Course Policy Regarding Group Work

No group work is planned for this course.

## 7.3 Course Policy regarding use of electronic devices and recording of Lectures

Electronic recording of classes is expressly forbidden without consent of the instructor. When recordings are permitted they are solely for the use of the authorized student and may not be reproduced, or transmitted to others, without the express written consent of the instructor.

# 8 University Statements

## 8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

## 8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

## 8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and

alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

## 8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

## 8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website

<https://www.ridgetownc.com/services/accessibilityservices.cfm>

## 8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community—faculty, staff, and students—to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that

instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

## 8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

## 8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>

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