1 Course Details

1.1 Calendar Description

This course examines the endocrine systems of farm animals and their applications to improve and monitor the production, performance, behavior and health of livestock. Considerable emphasis will be placed upon understanding how knowledge of endocrine regulation can be applied within animal production systems.

Pre-Requisites: ANSC*3080

1.2 Course Description

In this course, we hope to stimulate your excitement about science and the scientific approach; that is, how new information is discovered and how it can be applied to animal production systems. We will also encourage you to be an independent and critical thinker. This learning process is more important than remembering every detail of the material, but you need to know enough detail to be able to potentially manipulate the endocrine systems we are studying. Assessments emphasize the understanding and integration of information rather than memorization of material. The lecture notes will be posted on Courselink and students are expected to review the notes and to read the appropriate sections of the textbook to prepare for the lecture.
1.3 Timetable

Tuesday 1:00 - 2:20 p.m.; Thursday 1:00 - 2:20 p.m. LA 204

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

1.4 Final Exam

The final assignment is due on Apr 9 at 4:30 pm.

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2 Instructional Support

2.1 Instructional Support Team

| Instructor: | James Squires |
| Email: | jsquires@uoguelph.ca |
| Telephone: | +1-519-824-4120 x53928 |
| Office: | ANNU 146 |
| Office Hours: | By appointment |

2.2 Teaching Assistants

| Teaching Assistant: | Christine Bone |
| Email: | cbone@uoguelph.ca |
| Office: | ANNU 208 |
| Office Hours: | Tues and Thursday 2:30-3:30 or email for a time that works best |

| Teaching Assistant: | Jocelyn Cameron |
| Email: | jcamer12@uoguelph.ca |
| Office: | ANNU 208 |
| Office Hours: | Tues and Thursday 2:30-3:30 or email for a time that works best |

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3 Learning Resources

3.1 Required Resources

Required Texts (Textbook)
N/A
3.2 Recommended Resources

Recommended (Textbook)


3.3 Additional Resources

Lab Manual (Lab Manual)
N/A

Other Resources (Other)

All course lectures and supplementary materials are available on the Courselink site.

Field Trips (Other)
N/A

Additional Costs (Other)
N/A

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. By the end of this course, successful students will be able to:

1. Understand and explain the concepts of endocrinology, including the structure and function of hormones and receptors, and the integration of hormone action.
2. Evaluate methods to study how endocrine systems work and how they can be manipulated or used to monitor animal production systems.
3. Integrate information to manipulate selected endocrine systems that can affect
   • animal growth and carcass composition
   • the production of animal products, and
animal behaviour, health and response to environment
4. Critically analyse experiments in endocrinology in written form and in class presentations

5 Teacing and Learning Activities

5.1 Lecture

Tue, Jan 7

Topics: Endocrine Systems

• Introduction and overview of hormones and endocrinology

References: • Textbook Ch. 1, pp. 1-6

Thu, Jan 9

Topics: Endocrine Systems

• Synthesis, release and metabolism of hormones

References: • Textbook Ch. 1, pp. 7-17

Tue, Jan 14

Topics: Endocrine Systems

• Cell surface receptors
References:  
• Textbook Ch. 1, pp. 18-29

Thu, Jan 16

Topics: Endocrine Systems

• Intracellular surface receptors

References:  
• Textbook Ch. 1, pp. 29-38

Thu, Nov 21

Topics: Endocrine Systems

• Integration of hormone action

References:  
• Textbook Ch. 1, pp. 39-44

Thu, Jan 23

Topics: Endocrine Systems

• Midterm quiz review

Tue, Jan 28

Topics: Endocrine Systems

• In-class quiz on endocrine systems

Thu, Jan 30

Topics: Endocrine Methodologies

• Methods for determining how endocrine systems function
References:  

- Textbook Ch. 2, pp. 47-57

**Tue, Feb 4**

**Topics:** Endocrine Methodologies

Methods for determining how endocrine systems function (continued)

References:  

Textbook Ch. 2, pp. 47-57

**Thu, Feb 6**

**Topics:** Endocrine Methodologies

- Assay methods for measuring hormones

References:  

- Textbook Ch. 2, pp. 57-67

**Tue, Feb 11**

**Topics:** Endocrine Methodologies

- Receptor binding assays

References:  

- Textbook Ch. 2, pp. 67-70

**Thu, Feb 13**

**Topics:** Endocrine Methodologies

- Methods for producing hormones

References:  

- Textbook Ch. 2, pp. 70-77

**Tue, Feb 25**
Topics: Endocrine Methodologies

- Manipulating endocrine systems

References:

- Textbook Ch. 2, pp. 77-86

Thu, Feb 27

Topics: Endocrine Methodologies

- Midterm quiz review

Tue, Mar 3

Topics: Endocrine Methodologies

- In-class quiz on endocrine methods

Thu, Mar 5

Topics: Applications of Endocrinology

- Presentation and Final Assignment Instructions and Review

Tue, Mar 10

Topics: Applications of Endocrinology

- Guest Lecture: Endocrine manipulations in aquaculture (R. Moccia)

Thu, Mar 12

Topics: Applications of Endocrinology
• **Student Presentations**
  • Topic: Endocrine manipulation of growth and carcass composition

**Tue, Mar 17**

**Topics:** Applications of Endocrinology

• **Student Presentations**
  • Topic: Endocrine manipulation of growth and carcass composition

**Thu, Mar 19**

**Topics:** Applications of Endocrinology

• **Student Presentations**
  • Topic: Endocrine manipulation of growth and carcass composition

**Tue, Mar 24**

**Topics:** Applications of Endocrinology

• **Student Presentations**
  • Topic: Endocrine effect on animal products

**Thu, Mar 26**

**Topics:** Applications of Endocrinology

• **Student Presentations**
  • Topic: Endocrine effect on animal products

**Tue, Mar 31**

**Topics:** Applications of Endocrinology
5.2 Final Assignment due April 9th at 4:30pm

5.3 Note:
This is a tentative schedule and may be changed at the instructor's discretion.

5.4 Extra

Additional Information for In-class Student Presentations (March 12 to April 2)

Groups of 5 students will present on specific applications of endocrinology in Animal Biosciences that are of interest to the group. Background information is available in the textbook to help the groups to get started on their presentations, but the material presented should be current. The presentations will include a discussion of innovative methods used in endocrinology and applications of various endocrine systems. They consist of a 30-minute seminar with 10 additional minutes for discussion. There will be 2 student presentations in one class period. PowerPoint or other computer graphics programs should be used.

Presentations should cover the following points:

- **Introduction**: A summary of the relevant literature in the area that provides a current overview of the subject. Why is this area important?
- **Endocrinological Principles**: A description of the endocrinological principles involved in the problem. This includes an outline of the hormones and receptors involved and their mechanism of action.
- **Innovative Research**: A critical discussion of at least two different key papers (not review articles) in peer-reviewed journals that have made a significant impact or described key methodologies in this area of endocrinology. How have these
findings helped to advance the level of knowledge or impact this area of endocrinology? How are they innovative? What model systems are used for this work? What were the key findings?

• **Applications:** A discussion of current applications and other potential applications of the system. How is the system modified or otherwise used to advantage? What is the potential impact of this?

An example presentation will be provided on CourseLink that demonstrates the quality of content that is expected from the presentations. A description of the assignment criteria being addressed on each slide will be available in the notes section for each slide. Presenters must email the presentation to the instructor by the day before their set presentation date so that it can be posted on CourseLink. Each group will be contacted by the TAs through email to facilitate a meeting at least one week prior to the presentation date. The TA check in meeting is worth 2% of the presentation mark and will provide the students with an opportunity to receive feedback and make any necessary changes to their presentations in advance.

**Peer Feedback & Additional Bonus Questions**

All students are expected to be present at these presentations and should actively contribute to the discussion by asking questions and adding in new information. Students are also expected to make written critical comments on the presentation through 5 presentation bonus questions. For 5 presentations on different days, you can submit the answer to the following bonus question:

**Describe how one of the presentations today was innovative and might lead to significant impacts on animal production systems.**

Each answer to this bonus question should be completed on the Oral Presentation Peer Feedback form given out on the day of the presentation.

**Evaluation of the Presentation**

| TA check-in prior to presentation | 2% |
| Format of the presentation (quality of slides, clarity of presentation) | 3% |
| Content of the presentation and question period (amount of research, quality of information, originality, level of understanding of topic, ability to answer questions) | 15% |

**Total for Presentation (Group Mark)** 20%
The additional 5% for answers to presentation bonus questions is an individual grade.

Presentation Topics

**Topic 1: Endocrine Manipulation of Growth and Carcass Composition**

4 Student presentations from the following topics:

- Porcine stress syndrome and PSE meat
- Effects of somatotropin
- Effects of b-agonists
- Anabolic steroids and analogues
- Dietary chromium and insulin
- Leptin and other adipokines and lipokines
- Thyroid hormones
- Dietary PUFA (linoleic, linolenic, gamma-linolenic acid and conjugated linoleic acid)
- Control of appetite
- Antimicrobials, prebiotics and probiotics
- Effects of the gut microbiome

**Topic 2: Endocrine Effects on Animal Products**

4 Student presentations from the following topics:

**Milk Production**

- Hormonal effects on mammary growth and initiation of lactation
- Hormonal effects (eg bST) on maintenance of lactation
- Metabolic diseases of lactation (milk fever, ketosis)

**Wool Production**

- Factors affecting wool production and endocrine defleecing

**Egg Production**
• Regulation of follicular development, egg production and moulting
• Regulation of eggshell formation and calcium homeostasis
• Endocrine effects on sexual development in chickens

**Topic 3: Effects on Animal Behaviour, Health and Response to Environment**

4 Student presentations from the following topics:

• Endocrine measures of health and production efficiency
• Endocrine applications in toxicology
• Control of broodiness in poultry
• Applications of pheromones in vertebrates
• Applications of pheromones in Insects
• ‘Sniffer Dogs’ as bioassay tools
• The skin as an endocrine tissue
• Endocrine control of cancer

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**6 Assessments**

**6.1 Assessment Details**

**Course Assignments and Tests (100%)**

**Course Assignments and Tests**

<table>
<thead>
<tr>
<th>Assignment or Test</th>
<th>Due Date</th>
<th>Contribution to Final Mark (%)</th>
<th>Learning Outcomes Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation (question submission)</td>
<td>Jan 7- Mar 3</td>
<td>5%</td>
<td>1,2</td>
</tr>
<tr>
<td>Quiz on endocrine</td>
<td>Jan 28</td>
<td>15%</td>
<td>1,2</td>
</tr>
<tr>
<td>Assignment</td>
<td>Date</td>
<td>Weighting</td>
<td>Topics</td>
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<tr>
<td>----------------------------</td>
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</tr>
<tr>
<td>Quiz on endocrine methods</td>
<td>Mar 3</td>
<td>15%</td>
<td>1,2</td>
</tr>
<tr>
<td>Assignment</td>
<td>Mar 19</td>
<td>10%</td>
<td>4</td>
</tr>
<tr>
<td>Class presentation</td>
<td>Mar 12– Apr 2</td>
<td>20% group mark</td>
<td>3,4</td>
</tr>
<tr>
<td>Presentation bonus questions</td>
<td>Mar 12-Apr 2</td>
<td>5%</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>Final assignment</td>
<td>Apr 9 - 4:30 pm (Hardcopy due to the instructor or TA)</td>
<td>30%</td>
<td>3,4</td>
</tr>
</tbody>
</table>

Note: This is a tentative mark breakdown and may be changed at the instructor’s discretion.

Final assignment date and time: **Due Apr. 9 at 4:30 p.m.**

Final assignment weighting: 30%

**Group Work**

At the beginning of the semester, students are asked to form groups of 5 based on common interest of a topic for the presentations (listed below). In these groups, students will work together for the presentations. As well, groups will be required to collaborate in submitting one question per lecture topic that will be used for selection of questions for the midterm quizzes.

**Course Quizzes and Assignments**
The quizzes in this course are in a short answer format and are intended to test the knowledge of the material. Each quiz is worth 15% and non-cumulative. At the end of each lecture topic, students are asked to submit one question they feel would be appropriate for the midterm based on the material covered. Students are encouraged to use suggested review questions available on CourseLink as a guide. Questions that best match the learning objectives will be selected to comprise the quizzes. A link to a google document will be available on CourseLink for students to share their questions and collaborate in developing solutions in advance.

Assignments are designed for students to apply and understand the material presented in lectures. One assignment (10%) requires students to critically analyze a scientific paper. The final assignment (30%) is designed to build off of the material from the group presentations. The details for the final assignment will be released mid-February.

**Participation (Question Submission)**

The objective of the 5% participation mark is to provide an anonymous platform for students to submit questions they have regarding the lecture or topics that they would like clarified. Questions can be submitted at the end of each lecture on CourseLink and will assist the instructors in developing review questions and concepts to be covered at the start of the following lecture.

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### 7 Course Statements

#### 7.1 Grading Policies

Hard copies of the assignments should be submitted room 208 ANNU by 4:30 p.m. on the due date. Late penalties of 2% per day will be assessed for late submissions.

Our philosophy with grading is that if you work hard and deserve an A, you will not be prevented from receiving that grade. There is no set number of A’s that can or have to be assigned. We want all students to work hard and do the best that they can. That being said, we will be grading according to the university policy outlined below.
The assignment of grades at the University of Guelph be based on clearly defined standards, which are to be published in the Undergraduate Calendar for the benefit of faculty and students and that the definitions for each of the numerical grade range (letter grades) be as follows:

- **80 - 100 (A) Excellent.** An outstanding performance in which the student demonstrates a superior grasp of the subject matter, and an ability to go beyond the given material in a critical and constructive manner. The student demonstrates a high degree of creative and/or logical thinking, a superior ability to organize, to analyze, and to integrate ideas, and a thorough familiarity with the appropriate literature and techniques.

- **70 - 79 (B) Good.** A more than adequate performance in which the student demonstrates a thorough grasp of the subject matter, and an ability to organize and examine the material in a critical and constructive manner. The student demonstrates a good understanding of the relevant issues and a familiarity with the appropriate literature and techniques.

- **60 - 69 (C) Acceptable.** An adequate performance in which the student demonstrates a generally adequate grasp of the subject matter and a moderate ability to examine the material in a critical and constructive manner. The student displays an adequate understanding of the relevant issues, and a general familiarity with the appropriate literature and techniques.

- **50 - 59 (D) Minimally Acceptable.** A barely adequate performance in which the student demonstrates a familiarity with the subject matter, but whose attempts to examine the material in a critical and constructive manner are only partially successful. The student displays some understanding of the relevant issues, and some familiarity with the appropriate literature and techniques.

- **0 - 49 (F) Fail.** An inadequate performance.

7.2 Course Policy on Group Work

All group members are expected to contribute equally to the class presentations, but individuals may be responsible for different aspects of the work. All students in the group normally participate in the presentation.

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-regregchg.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
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