

# Course Outline Form: Winter 2018

## **General Information**

**Course Code:** ANSC\*4490

**Course Title:** Applied Endocrinology

### **Course 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.

**Credit Weight:** 0.5

**Academic Department:** Animal Biosciences

**Campus:** Guelph

**Semester Offering:** Winter 2018

**Class Schedule and Location:** Tuesday 1:00 - 2:20 p.m.; Thursday 1:00 - 2:20 p.m. ANNU 156

## **Instructor Information**

Instructor Name: E. James Squires

Instructor Email: jsquires@uoguelph.ca

Office location and office hours: ANNU 146 by appointment

## **GTA Information**

GTA Name: Christine Bone

GTA Email: cbone@uoguelph.ca

GTA office location and office hours: by appointment

GTA Name: Kayo Takeshima

GTA Email: ktakeshi@uoguelph.ca

GTA office location and office hours: by appointment

## **Course Content**

In this course, I hope to stimulate your excitement about science and the scientific approach; that is, how new information is discovered. I 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. Assignments are therefore normally take-home with the emphasis on the understanding and integration of information rather than memorization of material. The midterm exam will be held during class time.

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.

### **Specific Learning Outcomes:**

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 performance.
4. Critically analyse experiments in endocrinology in written form and in class presentations

### **Lecture Content:**

#### **Hormone and Receptor Structure and Function**

- Introduction and overview of hormones and endocrinology **Jan. 9**
- Synthesis, release and metabolism of hormones **Jan. 11**
- Intracellular and extracellular mechanisms of hormone action **Jan. 16, 18**
- Integration of hormone action **Jan. 23**

#### **Endocrine Methodologies**

- Methods for determining how endocrine systems function **Jan. 25, 30**
- Methods for measuring hormones and receptors **Feb. 1, 6**

- Methods to produce hormones and manipulating function **Feb. 8, 13**

**Midterm review class**

**Feb. 15**

**Midterm exam**

**Feb. 27 in class**

### **Class presentations**

Groups of 4-5 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, which summarizes the relevant literature in the area and provides a current overview of the subject. Why is this area important?
- 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.
- A critical discussion of at least two different key papers in peer-reviewed journals that have made a significant impact or described key methodologies in this area of endocrinology. What model systems are used for this work? What were the key findings? How have these findings helped to advance the level of knowledge or impact this area of endocrinology? How are they innovative?
- 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?

Presenters should email the presentation to the TA before class time and a summary of the presentation (handout, 6 slides per page) should also be ready as a handout for the class, including relevant references. A written summary of the presentation (not more than 4 pages not including references) is due the following class period. Presentations and summaries will be posted on Courselink and will serve as course notes for the class.

**You are strongly encouraged to preview your presentation with the instructor beforehand so that you can get feedback!**

All students are expected to be present at these presentations and are expected to contribute to the discussion and make written critical comments on the presentation. Students are responsible for the concepts discussed during both the lectures and Student Presentations; thus it is important that students keep the handouts provided by each presentation group and also ASK QUESTIONS during the presentations to ensure that each paper is understood.

**Evaluation:**

Format of the presentation (quality of slides, clarity of presentation)	5%
Content of the presentation (amount of research, quality of information, originality)	10%
Question period (levels of understanding of topic, ability to answer questions)	5%
Written summary (clear explanation, coverage of main points, implications)	5%
<b>Total</b>	<b>25%</b>

**Presentation topics:**

<b>Endocrine Manipulation of Growth and Carcass Composition</b>	<b>Mar. 1, 6, 8, 13, 15</b>
<i>GUEST LECTURE: Endocrine manipulations in aquaculture</i>	
<b>8 Student presentations from the following topics:</b>	
<ul style="list-style-type: none"> <li>• Porcine stress syndrome and PSE meat</li> <li>• Effects of somatotropin</li> <li>• Effects of <math>\beta</math>-agonists</li> <li>• Anabolic steroids and analogues</li> <li>• Dietary chromium and insulin</li> <li>• Leptin and other adipokines and lipokines</li> <li>• Thyroid hormones</li> <li>• Dietary PUFA (linoleic, linolenic, gamma-linolenic acid and conjugated linoleic acid)</li> <li>• Control of appetite</li> <li>• Antimicrobials, prebiotics and probiotics</li> <li>• Effects of the gut microbiome</li> </ul>	

**Endocrine Effects on Animal Products****Mar. 20, 22, 27****6 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

**Effects on Animal Behaviour, Health and Welfare****Mar. 29, Apr 3, 5****5 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

**Course Assignments and Tests:**

Assignment or Test	Due Date	Contribution to Final Mark (%)	Learning Outcomes Assessed
Assignment #1	Feb. 1	5%	1
Midterm	Feb. 27	20%	1, 2
Assignment #2	Mar. 13	15%	4
Class presentation	Mar. 1 – Apr. 5	25% group mark	3, 4
Final assignment	Apr. 13 - 4:30 pm	35%	3, 4

**Final assignment date and time:** Due Apr. 13 at 4:30 p.m.**Final assignment weighting:** 35%

## **Course Resources**

### **Required Texts:**

N/A

### **Recommended Texts:**

Applied Animal Endocrinology 2nd Edition, E.J. Squires, CAB International (also available on reserve at the library and as an ebook on Amazon and Google Play)

### **Lab Manual:**

N/A

### **Other Resources:**

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

### **Field Trips:**

N/A

### **Additional Costs:**

N/A

## **Course Policies**

### **Grading Policies**

Hard copies of the assignments should be submitted at my office room 146 ANNU by 4:30 p.m. on the due date. Late penalties of 2 % per day will be assessed for late submissions.

### **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.

### **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.

## **University Policies**

### **Academic Consideration:**

The University of Guelph is committed to supporting students in their learning experiences and responding to their individual needs and is aware that a variety of situations or events beyond the student's control may affect academic performance. Support is provided to accommodate academic needs in the face of personal difficulties or unforeseen events in the form of Academic Consideration.

Information on regulations and procedures for Academic Consideration, Appeals and Petitions, including categories, grounds, timelines and appeals can be found in [Section VIII \(Undergraduate Degree Regulations and Procedures\) of the Undergraduate Calendar](#).

### **Academic Misconduct:**

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 discourages misconduct. 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.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar: [Section VIII \(Undergraduate Degree Regulations and Procedures\) of the Undergraduate Calendar](#).

### **Accessibility**

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the

University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability should contact the Centre for Students with Disabilities as soon as possible.

For more information, contact CSD at 519-824-4120 ext. 56208 or email [csd@uoguelph.ca](mailto:csd@uoguelph.ca) or see the website: [Student Accessibility Services Website](#)

### **Course Evaluation Information:**

End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions used as an important component in the Faculty Tenure and Promotion process, and as valuable feedback to help instructors enhance the quality of their teaching effectiveness and course delivery.

While many course evaluations are conducted in class others are now conducted online. Please refer to the [Course and Instructor Evaluation Website](#) for more information.

### **Drop period:**

The drop period for single semester courses starts at the beginning of the add period and extends to the Fortieth (40th) class day of the current semester (the last date to drop a single semester courses without academic penalty) which is listed in [Section III \(Schedule of Dates\) of the Undergraduate Calendar](#).

The drop period for two semester courses starts at the beginning of the add period in the first semester and extends to the last day of the add period in the second semester.

Information about Dropping Courses can be found in [Section VIII \(Undergraduate Degree Regulations and Procedures\) of the Undergraduate Calendar](#).

### **Additional Course Information**

N/A