



ZOO*3600 Comparative Animal Physiology I

Fall 2019

Section(s): C01

Department of Integrative Biology

Credit Weight: 0.50

Version 2.00 - June 10, 2019

1 Course Details

1.1 Calendar Description

This course will examine the physiological processes that enable animals to live within a diverse range of environments. Lectures will focus on the underlying molecular and cellular events that mediate physiological processes and contribute to whole animal homeostasis, and emphasize strategies and adaptations used by different animals when influenced by various environmental conditions. Fundamental mechanisms in animal physiology such as diffusion, osmosis, feedback systems, and homeostasis will be explored in nervous, muscular, endocrine and sensory physiological systems. An associated lab course (ZOO*3610) is available.

Pre-Requisites: BIOC*2580, ZOO*2090, (STAT*2040 or STAT*2230 is recommended)

Restrictions: ZOO*3200

1.2 Timetable

Lectures: Tuesdays and Thursdays, 1:00 - 2:20 in Alex 100

There is no class on Oct 15th, 2019.

Last class is Nov 28th, 2019.

1.3 Final Exam

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

2 Instructional Support

2.1 Instructional Support Team

Instructor: Todd Gillis PhD
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Telephone: +1-519-824-4120 x58786
Office: SC1 3471

3 Learning Resources

3.1 Required Resources

Animal Physiology (Textbook)

Animal Physiology (4th Ed) by R.W. Hill, G.A. Wyse, and M. Anderson (2016). Published by Sinauer Associates, Inc.,

ISBN 9781605354712

On reserve at the library

*****You can also use the 3rd edition. Buy used, save your money.

Courselink (Website)

<https://courselink.uoguelph.ca>

This course will make use of the University of Guelph's course website on D2L (via Courselink). Consequently, you are responsible for all information posted on the Courselink page for ZOO*3600. Please check it regularly. Lecture material will be posted the night before a lecture. This should not be treated as a substitute for the lectures; instead, this material should be used to help you prepare for lectures and should be augmented with careful lecture notes.

3.2 Additional Resources

Eckert's Animal Physiology (Textbook)

Eckert's Animal Physiology (5th Ed.) by Randall et al. (2002)

Principles of Animal Physiology (Textbook)

Principles of Animal Physiology (1st Ed.) by Moyes and Schulte (2006)

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Understand the concept of homeostasis, the basic principles of membrane transport and how muscles, nerves, endocrine and sensory systems function in a variety of invertebrates and vertebrates.
 2. Synthesize information to explain the regulation of physiological systems at multiple levels of organization (e.g. molecular, cellular, organ systems and whole animal).
 3. Integrate data from the primary literature, on a variety of animals, to build an understanding of comparative physiology.
 4. Apply an understanding of physiological systems to predict the influence of environmental change on the function and regulation of mechanisms in animals.
 5. Analyze and summarize current publications in comparative physiology and identify critical connections with previous studies to describe progress in the field.
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5 Teaching and Learning Activities

5.1 Course Content

Topic	Date	Chapter	Example questions
1) Central Themes in Animal Physiology	Sept. 5	1	Why are most physiological systems based on negative feedback mechanisms?
2) Membrane Transport of Ions & Water	Sept. 10, 2, 5, 6, 12, 17	10, 16, 28	Why do red blood cells burst in pure water? What is the difference between facilitated diffusion and active transport?
3) Nerves	Sept. 19, 12, 13, 24, 26, Oct 1, 3		Why has the squid giant axon been so useful to understand neurons? What are the factors that affect conduction speed?
4) Muscles	Oct. 8, 10, 22, 24,	8, 20, 21, 25	How do muscle proteins slide back and forth to produce force and movement? How can the muscles of flying insects contract 10 times faster than vertebrate muscles?

Topic	Date	Chapter	Example questions
5) Endocrinology	Oct 29, 31 Nov 5, 7, 12	2, 16, 17, 21	Why are thyroid hormones important for metamorphosis? What happens when estrogen mimics are present in the environment?
6) Sensory Physiology	Nov. 14, 19, 21, 26, 28	14	How do sea turtles and birds use the Earth's magnetic field to migrate?

Textbook Readings are from Hill et al. 2012 and Hill et al. 2016 (same chapters)

5.2 Important Dates

Written Assignment 1 due Oct 4th 2019, midnight

Midterm: Oct 17th 2019, in class

Written Assignment 2 due Nov 22nd 2019, midnight

Final Exam: TBA

6 Assessments

6.1 Assessment Details

Written Assignment 1 (10%)

Due: Fri, Oct 4

Course Content/Activity: 1-6, summary of assigned paper (500 words)

Learning Outcome(s) Addressed: 5

Midterm Exam (30%)

Date: Thu, Oct 17

Course Content/Activity: 1-3 (In-class)

Learning Outcome(s) Addressed: 1, 2, 3

Written Assignment 2 (20%)**Due:** Fri, Nov 22**Course Content/Activity:** 1-6, assigned papers (1000 words)**Learning Outcome(s) Addressed:** 5**Final Cumulative Exam (40%)****Course Content/Activity:** 1-6, with emphasis on material discussed after the midterm**Learning Outcome(s) Addressed:** 1-4**6.2 Description of Assessments**

Exams: Your understanding of the physiological mechanisms introduced in class and through assigned textbook readings will be assessed through an in-class midterm and a cumulative final exam held during the final exam period.

Written assignment #1 (10% of grade):**Purpose:**

- 1) To get students reading current scientific literature
- 2) To increase skills in scientific communication

Summary:

Students will write a summary of a recent paper in comparative physiology (max. 500 words). Paper will be selected from a list of 6 provided by instructors. Summary needs to be written so that a senior high school student could comprehend the purpose and significance of work. Further details will be provided in handout.

Written assignment #2 (20% of grade):**Purpose:**

To increase understanding of how current research is dependent on the previous work of others.

Summary:

Students will choose one paper from a list of 8 provided by the instructors. The report (max. 1000 words) will summarize the paper and describe how the work has been influenced by

earlier studies. Further details will be provided in handout.

7 Course Statements

7.1 Grading

Written assignments will be submitted through the course D2L website. Grades will be assigned according to the standards outlined in the U of G Undergraduate Calendar (p40 - 41).

Late Policy: The written assignment is due at 11:59 pm on indicated date. The late penalty is 25% of assignment value per day.

8 Department of Integrative Biology Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist. <http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance. <https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations. <http://www.uoguelph.ca/~ksomers/>

9 University Statements

9.1 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.

9.2 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>

9.3 Drop Date

Courses that are one semester long must be dropped by the end of the fortieth class day; two-semester courses must be dropped by the last day of the add period in the second semester. The regulations and procedures for course registration are available in the Undergraduate and Graduate 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>

9.4 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.

9.5 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.

More information can be found on the SAS website
<https://www.uoguelph.ca/sas>

9.6 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>

9.7 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.

9.8 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>
