

**University of Guelph, College of Biological Science
Department of Integrative Biology
COURSE OUTLINE**

Comparative Animal Physiology II (ZOO*3210), Winter 2014

TEACHING TEAM

Professor: Dr. Patricia Wright, Office SCIE 3468, ext. 52719, patwri@uoguelph.ca
Office hours: by appointment

Lab Instructor: Peter Smith, Office SCIE 3313, ext. 53676 pssmith@uoguelph.ca

Teaching Assistants: Elizabeth Johnston, Sarah Schorno, Lauren Sicoly

LEARNING OUTCOMES

By the end of this course students should have the knowledge and skills to:

1. Understand how a variety of invertebrates and vertebrates respire, circulate body fluids, respond to environmental changes in temperature and energy demands, iono- and osmoregulate and digest food.
 2. Synthesize information on physiological regulation of a particular system at multiple levels of organization (eg. molecular, cellular, organ systems, whole animal).
 3. Provide examples of how recent research in comparative animal physiology has contributed to our understanding of basic science (eg. structure-function relationships, acclimation/acclimatization changes) and applied science (eg. aquaculture, global climate change).
 4. Formulate testable hypotheses, plan simple experiments to test hypotheses, organize data into graphs or tables and interpret results.
 5. Using a variety of tools and instruments, measure oxygen consumption, enzyme activities, plasma osmolarity and nitrogen excretion rates in animals.
 6. Write a coherent and concise laboratory report.
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LECTURES: Lectures will be held in THRN 1200 on Tuesday/Thursday, 1:00-2:20 pm

TOPICS: The questions below are examples of the topics that will be covered under each section.

Textbook Readings from Hill et al. 2012

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| 1. Introduction (Jan. 7 th) | Chapters 1, 2, 3, 5 |
| 2. Respiration (Jan. 9 th -23 rd)
How do amphibious fish switch between aquatic and terrestrial respiration? How is blood oxygen transport affected by moving from water to land? | Chapters 22, 23, 24 |
| 3. Circulation (Jan. 28 th -Feb. 4 th)
How have circulatory systems evolved in diving animals? Why have reptile hearts evolved diverse chambers and shunts? | Chapters 25, 26 |
| 4. Metabolism and Thermoregulation (Feb. 6 th -27 th)
Why can't small mammals stay active in arctic winters? How can arctic ground squirrels arouse so quickly from hibernation? | Chapters 7, 8, 9, 10 |
| 5. Ionic and Osmotic Regulation and Excretion (Mar. 4 th -20 th)
Aquatic animals may regulate or conform to the ionic and osmotic properties of their environment. How do teleost and elasmobranch fishes compare? Terrestrial animals must avoid dehydration. How do kangaroo rats survive in hot deserts without drinking water? | Chapters 27, 28, 29 |

6. Digestion (Mar. 25th-Apr. 15th)

Chapters 6, 21

You are what you eat! Digestive systems have evolved to accommodate specialized diets in different animal groups. How do nectar-feeding birds balance nutrient intake and water load? How do pythons ingest and digest whole animals larger than themselves?

7. Integration of Physiological Systems (Apr. 3rd)

LABORATORY:

Laboratories will be held in SCIE 3314 from 2:30 to 5:20 pm. Labs are every second week. Labs start the week of January 6th, 2014.

Lab	Dates:	Lab Topic	Assignment	% mark	Due
1	Jan. 08-16	Goldfish SDA	Lab Report	8	Check "DROP-BOX" for date and time.
2	Jan. 22-30	Enzyme Activity	Lab Report	8	
3	Feb. 05-13	Trout Ion Regulation	Lab Report	8	
4	Feb.26-Mar.06	Nitrogen excretion metamorphosis	Lab Report	8	
5	Mar. 12-27	Ocean warming and environmental physiology	Lab Report	8	

Winter 2014 LABORATORY SECTIONS

If you are in section:	Your first lab day is:
101	Jan. 08
102	Jan. 15
103	Jan. 09
104	Jan. 16

Attendance and participation in the laboratories is mandatory. Each student must attend and participate in the whole lab exercise to get credit for the assignment from that lab. Students are asked not to use cameras and / or cell phones in the lab.

EVALUATION:

Midterm Exam	Thursday, February 13 th , in class	20%
Final Cumulative Exam	Saturday, April 12 th , 8:30 am	40%
Lab Assignments		40%
Total		100%

Grades will be assigned according to the standards outlined in the U of G Undergraduate Calendar (p40-41).

Description of Assessment

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.

Lab exercises feature utilization of equipment and techniques for quantification of physiological phenomena. Lab assignments focus on data analysis, figure preparation, and writing skills.

RESOURCES:

Required Textbook (on reserve at the library)

Animal Physiology (3rd Ed) by R.W. Hill, G.A. Wyse, and M. Anderson (2012). Published by Sinauer Associates, Inc., ISBN 978-0-87893-559-8

Additional Textbooks (on reserve at the library)

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

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

Courselink

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*3200. Please check it regularly. Lecture outlines will be posted the night before a lecture. They should not be treated as a substitute for the lectures; instead, they should be used to help you prepare for lectures and should be augmented with careful lecture notes.

Undergraduate Calendar

The Undergraduate Calendar is the source of information about the University of Guelph's procedures, policies and regulations, which apply to undergraduate programs. It can be found at:

<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/>

OTHER IMPORTANT POLICIES AND PROCEDURES:

Late Policy

No extension on lab reports. Any assignment received after 2:30 pm on the due date is late. Late assignments will receive a penalty of 25% of the assignment value per day, including the date due, to a maximum of 2 days.

Absence and Illness

If you are absent from classes during the semester, you will be expected to make up missed lecture material on your own.

When an assignment is missed, you must notify the instructor in writing, with your name, id#, and e-mail contact as soon as possible. If requesting academic consideration on medical or compassionate grounds, be prepared to provide supporting documentation. Dates of incapacitation stated on the note must, of course, cover the date of the missed midterm or lab. The original paper copy of the note must be delivered to the course instructor (for missed midterm) or lab instructor (missed lab) within 5 days of the missed assignment (weekends included), or a mark of 0% will be assigned. Notes will not be returned. Please read "LAB RULES" section of your Lab Manual for further details and see the undergraduate calendar for information on regulations and procedures for Academic Consideration:

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

E-mail Communication

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

Drop Date

The last date to drop one-semester Winter 2014 courses, without academic penalty, is **Friday, March 7th**. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar:

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

Lab Assignments

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

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 or see the website: <http://www.csd.uoguelph.ca/csd/>

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:

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

Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded in any electronic media without the permission of the presenter, whether the instructor, a classmate or guest lecturer.

Course Evaluation information

CCS now provides the U of G Online Course Evaluation System in a secure, online environment. End of semester course and instructor evaluations provide students the opportunity to have their comments and opinions form part of the information used by Promotion and Tenure Committees in evaluating the faculty member's contributions in the area of teaching.

Course evaluations are now conducted through this web site. Login with your central email account login ID and password: https://courseeval.uoguelph.ca/CEVAL_LOGIN.php

Please Note: Instructors do **NOT** receive evaluations until the end of exam period. Furthermore, evaluations are anonymous, unless you specifically indicate you want to acknowledge your comments.