



ZOO*3620 Comparative Animal Physiology II

Winter 2023

Section(s): 01

Department of Integrative Biology

Credit Weight: 0.50

Version 2.00 - January 10, 2023

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. With a focus on respiratory, cardiovascular, osmoregulatory and digestive physiological processes, the lectures will examine the underlying molecular and cellular events that mediate physiological processes and contribute to whole animal homeostasis. An associated lab course (ZOO*3630) is available.

Pre-Requisites: ZOO*3600

Restrictions: ZOO*3210

1.2 Timetable

Lectures: Tuesday, Thursday – 1:00-2:20 pm – Room MCKN 117

1.3 Final Exam

Date: April 21st at 14:30.

Location: TBA. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Dr. Nicholas Bernier

Email: nbernier@uoguelph.ca

Telephone: 519-824-4120 x56093

Office: SSC 3467

Office Hours: I am available by email and by appointment. Please allow up

to 24 h for a response during business hours.

Email policy: I will respond to your emails as quickly as I am able within working hours (weekdays 8:30-4:30 PM). You are welcome to email me at any time, but please be aware that if you email me in the evening or on weekends, I might be unable to respond until working hours.

2.2 Teaching Assistants

Teaching Assistant (GTA): Reece Long
Email: rlong03@uoguelph.ca

Teaching Assistant (GTA): Chacko Sujith
Email: csujith@uoguelph.ca

3 Learning Resources

3.1 Required Resources

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*3620. 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 and textbook readings.

3.2 Recommended Resources

Animal Physiology (Textbook)

- Animal Physiology (Textbook)
- Animal Physiology (5th Ed) by Hill, Cavanaugh, and Anderson (2022). Published by Sinauer Associates, Inc., ISBN 978-0197552438
- On reserve at the library

3.3 Additional Resources

Principles of Animal Physiology (Textbook)

- Principles of Animal Physiology (3rd Ed.) by Moyes and Schulte (2016)
- On reserve at the library

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Contrast and compare how a variety of invertebrates and vertebrates respire, circulate body fluids and digest food
2. Synthesize information to compare the iono- and osmoregulatory strategies used by different animal species
3. Apply understanding of physiological systems to compare and contrast how endothermic and ectothermic species respond to alterations in physiological/environmental temperature and to changes in energetic demands
4. Integrate data from the primary literature to explain 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).
5. Utilizing recent primary literature in comparative animal physiology, identify a gap in the knowledge and generate hypotheses and predictions for a study.

5 Teaching and Learning Activities

5.1 Course Content

Topic	Date	Chapter	Example questions
1) Respiration	Jan 10-24	22, 23, 24	How is blood oxygen transport affected by moving from water to land? How do bar-headed geese migrate across the Himalayas?
2) Circulation	Jan 26 - Feb 9	25, 26	How have circulatory systems evolved in diving animals? Why have reptile hearts evolved diverse chambers and shunts?
3) Metabolism and Thermoregulation	Feb 14-28	7, 8, 9, 10	Why can't small mammals stay active in arctic winters? How can arctic ground squirrels arouse so quickly from hibernation?

Topic	Date	Chapter	Example questions
4) Ionic Regulation and Excretion	Mar 7-21	27, 28, 29, 30	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?
5) Food Intake and Digestion	Mar 23- Apr 4	6	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?
6) Integration of Physiological Systems	Apr 6		

Textbook readings / chapters are from Hill et al. (2021), Animal Physiology (5th Ed.). Note, however, that Hill et al. 2012 and 2016 can also be used as the chapters cover the same basic information.

5.2 Important Dates

All test and assignments are due on Fridays before midnight to the associated Dropbox folder on CourseLink.

- Unit Comprehension Tests (4): Jan 27 (Lectures 1-5); Feb 10 (Lectures 6-10); Mar 24 (Lectures 14-18); April 7 (Lectures 19-23)
- Feb. 3, 2023– Assignment due by 11:59 pm via CourseLink Dropbox
- Feb. 20 - Feb. 24, 2023 – Winter break: NO CLASSES
- Mar. 2, 2023 - Midterm exam in class
- April 21 at 14:30, location TBA

6 Assessments

6.1 Marking Schemes & Distributions

Name	Scheme A (%)
Midterm	25
Assignment	25

Name	Scheme A (%)
Comprehension Tests	15
Final Exam	35
Total	100

6.2 Assessment Details

Comprehension Tests (15%)

Date: 11:59 pm on the Friday after test is provided, Courselink

Learning Outcome: 1, 2, 3, 4

- Course content topics 1, 2, 4, and 5.
- Short tests are posted on Courselink on the last Tuesday of a unit and students will upload completed tests by Friday of the same week. A total of 4 test will be offered. Each test is worth 5% and only the top 3 marks will be kept.
- Due to the low stakes, "best 3 of 4" nature of this assessment, no late submissions or extensions will be granted.

Assignment (25%)

Due: Fri, Feb 3, 11:59 PM, Courselink

Learning Outcome: 5

- Course content: 1-7, according to interests of the student
- The purpose of the assignment is to get you to critically evaluate the primary literature. In this project students will be asked to choose one research paper from a list of 4 provided by the instructor on Courselink. After careful reading and analysis, you will then determine what is the next question that should be asked based on the results of the paper. Specific assignment instructions will be available on Courselink.
- It is expected that the students will summarize the area of interest and then write hypothesis and predictions that will answer the outstanding question.
- This project builds upon the skills developed in the written assignment of ZOO*3600.

Midterm Exam (25%)

Date: Thu, Mar 2, 1:00 PM, In class

Learning Outcome: 1, 2, 3

- Course content: 1-3
- Your understanding of the physiological mechanisms introduced in class and through assigned textbook readings will be assessed through an in-class midterm .

Final Cumulative Exam (35%)**Date:** Fri, Apr 21, 2:30 PM, TBA**Learning Outcome:** 1, 2, 3, 4

7 Course Statements

7.1 Grading

- **Unit comprehension tests (4) and the written assignment** will be submitted through the course D2L website. All due dates correspond to Fridays at 11:59 PM.
- Grades will be assigned according to the standards outlined in the U of G Undergraduate Calendar (p. 40 -41).
- **Late Policy:** The written assignment is mandatory and must be completed to receive a final grade for this course. A late penalty of 10% of assignment value per day, including weekends, will apply for assignments submitted after the posted deadline
- The submission folders for each unit comprehension test will close after the posted deadline and no late submissions will be accepted. Comprehension tests are not mandatory, but any missing submissions will be assigned a mark of 0. Only the top 3 marks will be kept.

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.selfregulationskills.ca/>

8.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar.
(<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

8.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

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>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

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

9.3 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>

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 make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

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>

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>

9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

9.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campusess/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campusess/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
