



# ZOO\*4170 Experimental Comparative Animal Physiology

Winter 2018

Sections(s): C01

Department of Integrative Biology

Credit Weight: 0.50

Version 1.00 - December 22, 2017

---

## 1 Course Details

### 1.1 Calendar Description

In this course an experimental approach to the study of physiological mechanisms and adaptive responses to changes in the environment will be stressed. The focus of the course will be on laboratory exercises.

**Pre-Requisite(s):** 1 of BIOM\*3200, HK\*2810, HK\*3940, ZOO\*3200, ZOO\*3210, ZOO\*3600

### 1.2 Course Description

The major theme of this course concerns how physiologists collect data and what happens to the data after it is collected. A primary objective is to understand and appreciate basic measurement techniques used in comparative animal physiology. To achieve this goal, students will perform a diverse array of laboratory experiments using techniques taken from the fields of molecular biology, biochemistry, neurophysiology, endocrinology, muscle- and cardio-physiology. Using a problem-based approach and exercises, students will also develop their skills for data analysis and presentation. The main focus of the lecture part of the course is on scientific communication through a combination of lectures about communication skills and opportunities to practice the experimental method, writing, and oral presentation. A secondary goal of the lectures is to encourage reading of the primary literature in comparative animal physiology.

### 1.3 Timetable

- Lectures: Tue/Thu 10:00 – 11:20 AM in MCKN room 228
- Laboratories:
  - Section 101: Mondays 2:30-5:20 PM in SSC 3305
  - Section 102: Tuesdays 2:30-5:20 PM in SSC 3305

### 1.4 Final Exam

There is no final exam in this course.

---

## 2 Instructional Support

### 2.1 Instructor(s)

**Frederic Laberge**

**Email:** flaberge@uoguelph.ca  
**Telephone:** +1-519-824-4120 x56238  
**Office:** SC1 1465  
**Office Hours:** By appointment

### 2.2 Instructional Support Team

**Lab Co-ordinator:** Colin DeMill  
**Email:** cdemill@uoguelph.ca  
**Telephone:** +1-519-824-4120 x56557  
**Office:** SSC 2475

---

## 3 Learning Resources

There is no textbook. Students are required to read articles from the primary literature.

### 3.1 Required Resources(s)

#### **ZOO\*4170 Laboratory Manual (Lab Manual)**

- Please purchase from the Integrative Biology Department prior to the first lab period.
- The cost is \$10.00

#### **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\*4170. Please check it regularly.

---

## 4 Learning Outcomes

---

## 5 Teaching and Learning Activities

### 5.1 Lectures

The focus of the lectures in the first half of the term will be two-fold: 1) a short introduction to the theoretical and practical background behind the experiments performed in the laboratory, and 2) scientific communication skills. In the second half of the term, lecture time will be spent introducing and discussing recent findings in the field of comparative animal physiology. This will be accomplished by students presenting and discussing the findings of recently published

papers.

## 5.2 Laboratories

Participation in laboratory sessions is mandatory. The initial six laboratory exercises are done simultaneously by all student groups, but each group does a different exercise on the same day (i.e. each group rotates through the first six exercises). For exercises #7 and #8, half of the class will do one exercise on the same day while the other half will carry out the other experiment. Group-specific laboratory schedules will be determined during the first intro lab. Maximum group size is three students. Every student must attend and participate in all labs in order to get credit for the lab report. No alternate assignments will be accepted for any of the lab exercises. Students are asked not to use cameras and / or cell phones in the lab. This course involves participation in laboratory exercises that use animals. If you are opposed to this participation then you have two options. 1. You can choose not to participate in some labs and forfeit those marks. 2. You can take an alternate physiology course that does not have a lab component.

## 5.3 Schedule

Lecture Date	Lecture Topic	What is Due	Lab Date	Lab Topic
Jan 9-11	Introduction, Lab Tutorials – 1-6		Jan 8-9	Intro
Jan 16-18	Lab Tutorials – 1-6	Lab Reports are due one week after lab session	Jan 15-16	Labs 1-6
Jan 23-25	Autorhythm Project – Background, Methods & Data analysis			
Jan 30	Skills: Writing style, Article condensation intro	Presentation schedule – in class		
Feb 1	Skills: Figures			
Feb 6-8	Skills: Oral presentations			
Feb 13-15	Skills: Experimental design and stats	Article Condensation; Feb 16		
Feb 20-22	NO CLASS – READING WEEK			
Feb 27	Presentations 1-3	Autorhythm Data		

Mar 1	Presentations 4-6			
Mar 6-8	Presentations 7-12	Autorhythm analysis plan; Mar 9	Mar 5-6	Labs 7-8
Mar 13-15	Presentations 13-18		No lab this week	No lab this week
Mar 20-22	Presentations 19-24	Autorhythm Report; Mar 23		
Mar 27-29	Presentations 25-30			
Apr 3-5	Presentations (if needed), Autorhythm Data and Report Discussion			

## 6 Assessments

### 6.1 Marking Schemes & Distributions

Name	Scheme A (%)
Lab Reports	50.00
Journal Article Consensation	5.00
Autorhythm Analysis Plan	5.00
Student Presentation	15.00
Questions on Student Presentations	5.00
Autorhythm Report	20.00
Total	100.00

### 6.2 Assessment Details

#### Lab Reports (50.00%)

**Date:** Labs 1-8

- Labs 1-6 - 6 X 5% = 30%
- Lab 7 - 15%
- Lab 8 - 5%
- Double space all text in all reports.
- Reports will consist of a result section and a detailed answer to a specific question or exercise associated with each lab.

- All graphs should be made with an appropriate graphics program.
- Reports may be written as a group report or as an individual report.
- The results section should follow the format used by The Journal of Experimental Biology (<http://jeb.biologists.org/>). Select a few articles from this journal to see how the results section is written and how the figures and tables are presented.
- Results. Limit the results to answer the questions posed in the laboratory manual and condense them as comprehensively as possible. Give the findings as nearly as possible in the terms in which the observations or measurements were made so as to avoid confusion between facts and inferences. State in the text noteworthy findings from each table and figure, and avoid restating in the text what is clear from the captions. Theory and inference must be clearly distinguished from what was observed, and should not be elaborated upon in the results section.
- Tables. Tables are used to present repetitive data and should be as economical of space as possible. Each table should be on a separate page and numbered with Arabic numerals. Use horizontal lines above and below the headings and below the columns, and seldom elsewhere. Never use vertical lines; leave extra space instead. Table captions should be succinct and identify the purpose of the table sufficiently well to allow the table to stand on its own. Indicate table footnotes by superscript lowercase letters and type them below the table.
- Figures. All lines must be sufficiently thick and all symbols, superscripts, subscripts, and decimal points must be in good proportion to the rest of the drawing and large enough to allow for easy viewing. Captions should identify the purpose and content of the figure sufficiently well to allow the figure to stand on its own.

### **Journal Article Consensation (5.00%)**

- To encourage reading of the primary literature, students will be asked to write a journal article condensation on the physiology of electric fishes.
- The instructions for the condensation and criteria for evaluation will be posted on the ZOO\*4170 CourseLink website.

### **Authorhythm Analysis Plan (5.00%)**

- A one-page plan of analysis including the hypothesis being tested, how the data will be obtained, and the statistical approach will be required several weeks in advance of the deadline for submission of the final autorhythm report.
- Timely feedback will be provided on the analysis plan to allow correction or fine-tuning of the analysis procedure.
- The goal of this exercise is to improve the quality of the final report.

### **Student Presentation (15.00%)**

- Each student will give a 15 min presentation based on an approved journal article concerning a specific topic in comparative animal physiology.
- The instructions for the presentation, criteria for evaluation, and schedule of talks will be posted on the ZOO\*4170 CourseLink website.

## Questions on Student Presentations (5.00%)

- Each presentation will be followed by a discussion period where students are expected to actively participate and contribute.
- To encourage participation and questions, for each presentation, three randomly selected students will be assigned the task of asking one question and completing a peer-review form that will be used by the instructor to grade the presentation.

## Autorhythm Report (20.00%)

- The autorhythm report is done as an individual report.
- Double space all text.
- A complete report is required: title page, abstract (max 200 words), introduction (2 pg max.), methods, results, discussion (4 pg max.), references cited.
- The introduction should give a general review of the topic and lead up to and end with hypotheses and predictions.
- The method section should be very brief (unless the methods deviated from those given in the instructions) and should state how the data was analyzed, i.e. a section on statistical analysis must be included.
- Results form the main part of this report - I am looking for a good result section, not for an essay on rhythms. Include graphs of your results with the fitted curve for each of the variables you chose to work on and other graphs that summarize your findings – be original. Give a summary table and / or figures of the class results. Give a clear interpretation of the data - what do the results say? What conclusions can be drawn from the data? Discussion: How do your results and the class results relate to observations in the literature? What are the limitations of your results? What are the conclusions?

---

# 7 Course Statements

## 7.1 Late Policy

No extension on lab and autorhythm reports. Any assignment received after 4:30 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 4 days.

## 7.2 Absence & Illness

- If you are absent from classes during the semester, you will be expected to make up missed lecture material on your own. Medical or compassionate documentation is required to miss any lab. This documentation must be submitted to Colin DeMill as soon as possible after your absence. If no documentation is provided, the assigned mark will be 0%.
- 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 assignment. The original paper copy of the note must be delivered to the course instructor (for missed autorhythm report or missed presentation) 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.

- 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>

## 7.3 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.

## 7.4 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](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.

---

# 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 regulations and procedures for [Academic Consideration](#) are detailed in the Undergraduate Calendar.

### 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 [Dropping Courses](#) are available in the Undergraduate Calendar.

### 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: [www.uoguelph.ca/sas](http://www.uoguelph.ca/sas)

## 9.6 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.

## 9.7 Recording of Materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate 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 which apply to undergraduate, graduate and diploma programs.

## 9.8 Resources

The [Academic Calendars](#) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.

---