

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

**COURSE OUTLINE**

**Experimental Comparative Animal Physiology (ZOO\*4170), Winter 2017**

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**TEACHING TEAM**

**Professor:** Fred Laberge, Office SSC 1465, ext. 56238, [flaberge@uoguelph.ca](mailto:flaberge@uoguelph.ca)  
Office hours: by appointment

**Lab Instructor:** Colin DeMill, Office SSC 3511, ext. 56557 [cdemill@uoguelph.ca](mailto:cdemill@uoguelph.ca)

**Teaching Assistant:** TBA

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**OBJECTIVES & LEARNING OUTCOMES**

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 oral and written scientific communication. This course differs from most others in that the lecture material largely supplements the laboratory experience. The course is "learner-centred".

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**LECTURES**

Lectures will be held in MCKN room 229 on Tue/Thu 10:00 – 11:20 (see *Schedule*). The focus of the lectures in the first half of the term will be two-fold: 1) the theoretical and practical background behind the assigned work and 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.

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**LABORATORY**

Laboratories will be held in SSC 3305 (see *Schedule*)  
Section 101 – Mon. 2:30-5:20; Section 102 – Tue. 2:30-5:20

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.

## Experimental Comparative Animal Physiology (ZOO\*4170), Winter 2017

### SCHEDULE

CLASS SCHEDULE			WHAT IS DUE	LAB SCHEDULE		
<b>Jan</b>	10-12	Introduction, Lab Tutorials – 1-6				
	17-19	Lab Tutorials – 1-6		<b>Jan</b>	16-17	Intro
	24-26	Autorhythm Project – Background, Methods & Data analysis	Lab Reports are due one week after lab session	<b>Jan</b>	23 to	Labs 1-6
	31	Skills: Writing style, Article condensation intro	Presentation schedule – in class	<b>Mar</b>	7	
<b>Feb</b>	2	Skills: Figures and stats				
	7-9	Skills: Oral presentations				
	14-16	Lab Tutorials – 7-8	Article Condensation #1; Feb 16			
	21-23	NO CLASS – READING WEEK				
	28	Presentations 1-4	Autorhythm Data			
<b>Mar</b>	2	Presentations 5-8				
	7-9	Presentations 9-16				
	14-16	Presentations 17-24	Article Condensation #2; Mar 16	<b>Mar</b>	13-28	Labs 7-8
	21-23	Presentations 25-32				
	28-30	Presentations 33-40	Autorhythm Report; Mar 30			
<b>Apr</b>	4-6	Presentations (if needed), Autorhythm Data and Report Discussion				

### EVALUATION

A. LAB REPORTS (Labs #1-6: 6 X 5%; Lab #7: 15%; Lab #8: 5%)	50
B. AUTORHYTHM REPORT	20
C. STUDENT PRESENTATION (15%) & QUESTIONS (5%)	20
D. JOURNAL ARTICLE CONDENSATIONS (2 X 5%)	10

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**A. LAB REPORTS.** 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.

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### **B. AUTORHYTHM REPORT.**

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 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?

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**C. STUDENT PRESENTATION & QUESTIONS.** 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. Each presentation will be followed by a brief 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.

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**D. JOURNAL ARTICLE CONDENSATIONS.** To encourage reading of the primary literature, students will be asked to write journal article condensations on two of the different topics being presented throughout the term. The instructions for the condensations and criteria for evaluation will be posted on the ZOO\*4170 CourseLink website.

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### RESOURCES:

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

**Lab Manual:** ZOO\*4170 Laboratory Manual. Please purchase from the Integrative Biology Department prior to the first lab period. The cost is \$10.00

**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\*4170. Please check it regularly.

### 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/>

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### OTHER IMPORTANT POLICIES AND PROCEDURES:

#### 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.

#### 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. 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>

#### 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 Winter 2017 courses, without academic penalty, is **March 10<sup>th</sup>**. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar: <http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

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## 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](mailto: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](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.