

**University of Guelph
College of Biological Sciences
Department of Integrative Biology**

COURSE OUTLINE

IBIO*6010 SPECIAL TOPICS IN PHYSIOLOGY
WINTER 2019

Specific topic: Scaling of Physiological Responses in Response to Global Change

General course description

'Special Topics' courses are taught by different faculty each year and the focus will vary from year to year. Each course offering will be identified as a section with its own title. This information will appear on your transcript, and this will allow students to participate in multiple offerings for these courses, since they will be identified as different sections, covering different course materials.

Course description specific to topic

Increasingly physiologists are being called upon to make sense of data that spans different levels of biological organization in order to both interpret and predict the effects of disturbances in the environment. With advances in the “omics” toolbox, scientists commonly measure the responses of animals at the molecular and cellular levels of organization. Similarly, techniques are increasing available to assess animals at higher levels of organization including organs and tissue responses, whole organism performance and even responses at the level of populations of organisms. Despite this deluge of information, it is often challenging to make sense of this data in the context of understanding: 1) the pathways and process networks are effected by environmental factors; 2) how to predict the effects of environmental factors on physiological function; and 3) how to extrapolate the applicability of results in one species to other species and situations? In this course we will explore these questions in the context of Global Change Biology which can be defined in the broadest sense as any consistent trend in the environment - past, present or projected - that affects a substantial part of the globe. In this context, students will explore the physiological responses of organisms to a range of stressors such as global climate change, rising tropospheric, ozone, carbon dioxide and sulphur dioxide concentrations, changing global radiation and stratospheric ozone depletion or contaminant and pollutant impacts of global relevance. Students will then use the Adverse Outcomes Pathway approach to organize the data and to help weigh the evidence in making conclusions of cause and effect relationships and to critically identify inconsistencies and data gaps.

Instructor

Glen Van Der Kraak
Office: 3477 SSC
e-mail: gvanderk@uoguelph.ca
Office hours: drop in

Learning outcomes

By the end of this course, students will:

- 1) Critically evaluate the quality and significance of primary research papers.
- 2) Demonstrate advanced scientific writing proficiency.
- 3) Search and evaluate citation data.
- 4) Understand the value and responsibilities of peer review and practice peer reviewing.
- 5) Demonstrate the ability to organize and present information orally and engage an audience.

Course schedule: a two-hour time slot once per week Time: TBD

Week (Date)	Activity
Week 1 (Jan 7-11)	Class introduction and orientation
Week 2 (Jan 14-18)	AOPs and Weight of Evidence
Week 3 (Jan 21-25)	Presentation 1
Week 4 (Jan 28-Feb 1)	Presentation 1
Week 5 (Feb 4-8)	Presentation 2
Week 6 Feb (11-15)	Presentation 2 and Criteria to critically assess the primary literature
Week 7 Feb (18-22)	Study break No class
Week 8 (Feb 25- March 1)	Critical review of papers
Week 9 (March 4-8)	Critical review of papers
Week 10 (March 11-15)	Feedback on final presentation
Week 11 (March 18-22)	Feedback on final presentation
Week 12 (March 25-29)	Final presentation 1
Week 13 (April 1-5)	Final presentation 1

There will be a series of assignments that will be assessed:

Presentation 1 and 2; This will include both oral and written summaries of current research papers that examine the impacts of Global Change on physiology of animals. Students will be expected to pick two separate papers that examine how the response to the selected stressor(s) has been shown to act multiple levels of biological organization. The emphasis here is on communication skills and how the students can effectively convey the salient parts of a research being investigated.

Critical review of papers: After receiving instruction in class, students will be expected to critically evaluate the quality of one of the research papers they have selected using criteria that evaluate the quality of the methods and the relevance of the response. The assessment will include both oral and written components.

Final presentation: Students will use the Adverse Outcome Pathway framework to describe and critically review the evidence that a Global change scenario affects the physiological fitness of an organism. In conducting the evaluation. The students are expected to describe the linkages that make up the AOP including:

1. Stressors
2. Molecular Initiating Event
3. Key Events
4. Adverse Outcome
5. Relationships Between Two Key Events
6. Network View
7. Life Stage Applicability
8. Taxonomic Applicability
9. Sex Applicability

From this students will develop an overall assessment of the AOP including:

1. Domain of Applicability
2. Essentiality of the Key Events
3. Weight of Evidence Summary
4. Quantitative Considerations

Methods of assessment

Assignment	Topic	% of Grade
1	Presentation 1: Oral and written	15
2	Presentation 2: Oral and written	15
3	Critical review of paper	15
4	Adverse Outcome Pathway: Oral and written	45
5	Participation, oral communication and professionalism	10

Course and University Policies

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, and be prepared to provide supporting documentation. See the graduate calendar for information on regulations and procedures for Academic Consideration:

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

Assignments that are submitted after the deadlines indicated on the assignment **will not be accepted** and the distribution of course marks **will not be altered** for any student unless Academic Consideration for illness or other compassionate grounds has been approved by the course instructor.

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 Graduate Calendar:

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.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 courses, without academic penalty, is the 40th class day. To confirm the actual date please see the schedule of dates in the Undergraduate Calendar. For regulations and procedures for Dropping Courses, see the Graduate Calendar:

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

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.

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.

Grading

Grading will follow the criteria outlined by the Graduate Calendar and as follows.

Percentage Grade	Letter Grade	Description
90-100	A+	Outstanding. The student demonstrated a mastery of the course material at a level of performance exceeding that of most scholarship students and warranting consideration for a graduation award.
80-89	A- to A	Very Good to Excellent. The student demonstrated a very good understanding of the material at a level of performance warranting scholarship consideration.
70-79	B	Acceptable to Good. The student demonstrated an adequate to good understanding of the course material at a level of performance sufficient to complete the program of study.
65-69	C	Minimally Acceptable. The student demonstrated an understanding of the material sufficient to pass the course but at a level of performance lower than expected from continuing graduate students.
0-64	F	An inadequate performance.

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-as-gradeint.shtml>

Campus Resources

The Academic Calendar is the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs:

<http://www.uoguelph.ca/registrar/calendars/index.cfm?index>

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

- make an appointment with a program counsellor in your degree program.

If you are struggling to succeed academically:

- 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/>

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/>

If you have a documented disability or think you may have a disability:

- The Centre for Students with Disabilities (CSD) can provide services and support for students with a documented learning or physical disability. They can also provide information about how to be tested for a learning disability. For more information, including how to register with the centre please see: <https://www.uoguelph.ca/csd/>