ZOO*4910 Integrative Vertebrate Biology

Fall 2022
Section(s): 01

Department of Integrative Biology
Credit Weight: 0.50
Version 4.00 - September 07, 2022

---

1 Course Details

1.1 Calendar Description

This course examines the proximate and historical causes of diversity in morphology, physiology and behaviour among major groups of vertebrates (fishes, amphibians, reptiles, birds, mammals). First, topics such as vertebrate origins, zoogeography, taxonomy and comparative methods will be developed as a foundation for inquiry. The remainder of the course will be organized around specific contemporary problems in vertebrate biology such as the evolution of endothermy; feeding strategies and metabolism; locomotion and migration; trends in vertebrate reproduction; evolution of brain size and complexity in relation to cognition and communication. Each problem will be explored through analyses of taxonomic diversity, historical and phylogenetic constraints, physiological and developmental causes, and functional effects.

Pre-Requisites: BIOL*2400, ZOO*2090
Co-Requisites: ZOO*3600

1.2 Course Description

This is a draft course outline and is subject to change up to the first day of classes, in keeping with the policy described in the University of Guelph Academic Calendar.

This course examines the wide diversity of vertebrate biology and delves into interesting issues and case studies in morphology, physiology and behaviour among the major groups of vertebrates (fishes, amphibians, reptiles, birds, mammals). The majority of this course will be organized around specific comparative topics in vertebrate biology such as the evolution of endothermy, speciation rates, how animals sense the world, locomotion, trends in vertebrate reproduction, environmental impacts on physiology and ecology, and the impact of climate change on wildlife. Each topic will be explored through analyses of evolutionary processes, diversity, physiological and developmental roots and causes, and functional effects. This course, rather than a traditional well-marked straight road with a textbook as a map is an exploration and thus we shall be ‘migrating’ among topics and taxa, stopping down for a punctuated visit before lifting off again. The overall goal of this course is to stimulate

curiosity and inquiry into vertebrate biology, and to develop an understanding and appreciation for the incredible diversity of form, function and ecology. Another important goal of this course is to provide students with the opportunity to explore and develop transferable skills in idea synthesis, oral communication, and graphic design. Students are encouraged to also take at least one of the three vertebrate laboratory courses (Herpetology, Mammalogy, Ornithology) that have been designed to complement this course.

1.3 Timetable

In fall 2022, this course will be taught in-person, but with some remote options (i.e. recorded lectures).

Class meetings: Monday, Wednesday, Friday 12:30-1:20 pm

Please reserve this time in your schedule. Some asynchronous remote elements may also be incorporated into the course. All lecture material will be recorded and available after class, but interactive elements of the course require real-time, synchronous participation.

Room: RICH 2529. All resources will be posted on Courselink.

Note: There are no labs for this course, although students are encouraged to participate in one of the vertebrate laboratory courses.

1.4 Final Exam

There will be no in-person final exam for this course. There will be one take-home exam.

---

2 Instructional Support

2.1 Instructional Support Team

Instructor:	Elizabeth Mandeville
Email:	emandevi@uoguelph.ca
Telephone:	+1-519-824-4120 x52843
Office:	SSC 1454
Office Hours:	Office hours will be held via Zoom. Mondays 1:30-2:30, or by appointment.

2.2 Teaching Assistants

Teaching Assistant (GTA):	Brynn Varcoe
Email:	bvarcoe@uoguelph.ca
Office Hours:	By appointment.

---

3 Learning Resources

There is no required textbook. Instead, we will read peer-reviewed papers on the topics we cover.

PDFs of primary literature will be supplied online and reading of the literature is required for participation in course activities.

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*4910. Please check it regularly as news items, videos to be watched asynchronously, lecture notes, and instructions for class and projects will be posted and updated frequently. Links to synchronous class sessions on Zoom will also be posted to Courselink.

3.2 Additional Resources

Undergraduate Calendar (Website)

https://www.uoguelph.ca/registrar/calendars/undergraduate/current/

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

---

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Integrate the fields of evolution, ecology, and physiology in understanding vertebrate diversity.
2. Understand the applicability for integrative vertebrate biology in primary research.
3. Analyze, synthesize, and integrate lecture and literature information, e.g. across major disciplines (ecology, evolution, and physiology) and across major vertebrate groups.
4. Engage in opinionated discussion/debate around topics related to vertebrate biology and support ideas and opinions with information from the primary and secondary literature, while appreciating the labile nature of scientific debate and discovery.

5. Appreciate and analyze the primary adaptations that facilitate vertebrate success across a variety of environments
6. Synthesize information from the primary literature into the written account of a species.
7. Generate recommendations for resolving topic areas where our understanding of vertebrate biology remains uncertain or controversial.

---

5 Teaching and Learning Activities

5.1 Additional Activities

Class will be held in-person, and will include a mix of lecture and interactive elements (note there will always be a recorded version of the lecture available)

Student in-class discussion will be a crucial part of this course, but virtual options may be offered at the discretion of the instructor, depending on student interest.

Examples of course content (subject to change):

- Brief introductions to bird, fish, mammal, amphibian, and reptile diversity
- Body size
- Life span
- Vision
- Reproductive strategy
- Genome size and ploidy
- Sex determination
- Speciation rates
- Response to anthropogenic change

---

6 Assessments

Assessment in Fall 2022 is designed to support student learning and with the goal of providing an equitable learning environment.

We will focus on frequent, low-stakes assignments designed to keep you up to date on class materials and encourage you to engage fully with the primary literature. There will also be several more substantial assignments over the course of the semester, including a take-home exam, Scientific Communication project, and Reproducible Research project.

Important things to know: deadlines will never move earlier. For some assignment categories (i.e. Think Pieces), you will get 1-2 "free" assignments, where the number you must turn in is less than the total number assigned.

6.1 Assessment Details

Think pieces (15%)

"Think pieces" will be assigned based on some of the primary literature readings for this course. These short written assignments (<1 page) consist of two paragraphs. The first paragraph is a summary of the paper; the second paragraph is synthesis and discussion of what the student learned, what was most interesting, what was difficult to understand, etc.

Discussion & Engagement (10%)

Participation in class discussions and interactive class activities is required. Depending on student interest, virtual options for participation may be available. Discussion & Engagement will be assessed by completing brief assignments based on the interactive course components. Attendance will not formally be taken, but learning the material will require engagement and discussion with classmates.

Course Content/Activity: Lectures, readings and outside class time

Learning Outcome(s) Addressed: 1, 2, 4, 7

Reproducible Research Project (25%)

Date: Fri, Oct 7

Increasingly the scientific community aims to make our research "reproducible". This means that many scientific papers are now published with accompanying data and code, so you can reproduce their analysis. For this assignment, students will learn about different repositories for publicly available data, and will download and do a small analysis for a dataset associated with one of the empirical papers we read in this course.

Take-home Exam (25%)

Date: Tue, Nov 8 - Fri, Nov 11

Course Content/Activity: Lectures, readings and debates

This will be a Take-Home exam. Students will have 72 hours to complete the exam. Use of notes, course resources, and the internet is permitted; collaboration between students is NOT permitted. The exam must be your own original work.

Learning Outcome(s) Addressed: 1-5

Scientific Communication assignment (15%)

Date: Mon, Nov 28

We will be reading many papers from the peer-reviewed scientific literature over the course of this semester. Learning to distill these highly technical, dense documents into something that actually makes sense to you takes a lot of practice. The next level of

scientific literacy is being able to communicate these ideas clearly to non-specialists - i.e., scientific communication.

For this project, each student will choose a peer-reviewed scientific paper, and choose an alternative method to communicate the major themes and findings of the study. You are encouraged to be creative with format; the only unacceptable format is scientific prose. Some formats you might consider are data visualization (some sort of diagram or schematic), a comic (bad drawing perfectly acceptable), a news article, a blog post, etc. You will share these products with the class in lieu of a final exam, and will provide comments/evaluation on peers' work.

Completion assignments (10%)

Short assignments, to be graded only for completion, will be given regularly and collectively will account for 10% of your final grade. These assignments are an opportunity to boost your grade; if all are submitted and are of reasonable quality, you will receive full marks.

---

7 Course Statements

7.1 Late Policy

Work is due by the date assigned; each day a major assignment is late without a valid excuse (Midterm Exam, Reproducible Research Project, Scientific Communication Project) will result in 10% reduction in score. For Completion Assignments and Think Pieces, each student may skip one assigned item in each category (i.e. one Think Piece AND one Completion Assignment) without penalty, no questions asked and no excuse needed.

I recognize that many students may face serious challenges due to the ongoing global pandemic and individual life circumstances. Please know that I regard your health and safety as the top priority; I will work with you to help fulfill academic requirements. If you are unable to meet the requirements of the course for any reason, please contact the instructor and we will work towards a solution.

7.2 Grading

Grading of your coursework will be conducted in a manner consistent with the definitions of grades provided in the university calendar. You should familiarize yourself with these definitions:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-grds-proc.shtml

7.3 Absence & Illness

If you are absent from classes during the semester, you will be expected to make up missed material using resources posted on Courselink. If you have questions, please post to the course discussion board to seek help from your peers.

When an assignment is missed, please notify the instructor in writing, with your name, id#, and e-mail contact as soon as possible. If you become ill and will be absent for a significant amount of time, please let the instructor know.

See the undergraduate calendar for information on regulations and procedures for Academic Consideration: Undergraduate Calendar - Academic Consideration

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: Course Evaluation

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.

7.5 Online Learning

Students in ZOO*4910 are expected to respect classmates and instructors at all times, in both in-person and virtual components of this class, and abide by the same standards for original work as in any other course.

Inappropriate online behaviour will not be tolerated. Examples of inappropriate online behaviour include:

· Posting inflammatory messages about your instructor or fellow students, including racist and/or sexist remarks

· Using obscene or offensive language online

· Copying or presenting someone else's work as your own

· Adapting information from the Internet without using proper citations or references

- Buying or selling term papers or assignments

- Posting or selling course materials to course notes websites

- Having someone else complete your quiz or completing a quiz for/with another student

- Stating false claims about lost quiz answers or other assignment submissions

- Threatening or harassing a student or instructor online

- Discriminating against fellow students, instructors and/or TAs

- Using the course website to promote profit-driven products or services

- Attempting to compromise the security or functionality of the learning management system

- Sharing your user name and password

- Recording lectures without the permission of the instructor

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-campuses/how-u-of-g-is-preparing-for-your-safe-return/

- https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

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