



IBIO*4500 Research in Integrative Biology I

Fall 2022

Section(s): 01

Department of Integrative Biology

Credit Weight: 1.00

Version 1.00 - September 07, 2022

1 Course Details

1.1 Calendar Description

The student will undertake an independent research project of a practical or theoretical nature that relates either to organismal biology or the teaching of organismal biology and is conducted under the supervision of a faculty member. Students must make arrangements with both a faculty supervisor and the course coordinator at least one semester in advance. A departmental registration form must be obtained from the course coordinator and submitted no later than the second class day of the semester in which the project is to be completed.

Pre-Requisites: 12.00 credits

Restrictions: Minimum cumulative average of 70%. Instructor consent required.

1.2 Course Description

Please note the proposed course format, schedule or location for the Fall 2021 semester may change up to the first day of classes due to personnel, resource, and public health circumstances and if conditions cannot be met to ensure the safety of our students and instructors. Continue to watch the Student Planning website as format information could be updated until the first day of classes.

To register, students must complete and submit to the course coordinator:

1. the "Project Approval" form, including the project advisor's signature;
 2. a Course Registration Waiver form (advisor's signature not required), including the credit overload section, if appropriate, to be signed by the course coordinator;
- and,

3. an unofficial copy of their transcripts.

For the F22/W23 academic year, the project approval and course registration waiver forms can be downloaded from: <https://bit.ly/3R1YQTA>

- Students enrolling in a research project for the first time will use course number IBIO*4500. IBIO*4510 is reserved for students taking additional credits through a research topics course.
- The student will undertake an independent research project of a practical or theoretical nature that relates either to ecology, evolutionary biology, comparative animal physiology or a related theme in biology or the teaching of these areas. The research will be conducted under the supervision of a faculty member in the Department of Integrative Biology.
- The course offers students the opportunity to gain hands-on research experience as well as a better appreciation of ways of engaging in scientific scholarship.
- Oral sessions will help develop the student's ability to communicate the rationale and relevance of the project and to clearly explain the approach taken.
- Written skills will be developed in the research proposal and final project report.
- Students should make arrangements with a faculty advisor and the course coordinator at least one semester in advance. **The project advisor must be a faculty member in the Department of Integrative Biology.** The second reader must also be a faculty member at the University of Guelph, but may be from another department. Faculty who will be on leave during the semester may not serve as advisors or second readers.

1.3 Timetable

See Activities section.

1.4 Final Exam

There is no final exam.

2 Instructional Support

2.1 Instructional Support Team

Course Co-ordinator:	Rob McLaughlin
Email:	rlmclaug@uoguelph.ca
Telephone:	+1-519-824-4120 x53620

Office: SSC 2456
Office Hours: By appointment

3 Learning Resources

There is no required textbook for this course.

3.1 Required Resources

Courselink (Website)

<https://courselink.uoguelph.ca>

Materials relevant to the course will be posted on the CourseLink site. In addition, the proposal, files for oral presentations and the final research paper will be submitted via the CourseLink dropbox. Details will be provided as the deadlines approach.

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. Design a self-guided research question and project at the level expected for a fourth-year independent research project within the constraints imposed by the course (one semester, available resources etc.).
 2. Apply the scientific method to current problems in comparative animal physiology, ecology and evolutionary biology.
 3. Evaluate scientific evidence and demonstrate the use of logic, in the evaluation of the literature, including information on multiple perspectives, and statistical techniques used to analyze data
 4. Construct and efficiently conduct an experimental design by actively employing sampling techniques (empirical or theoretical) necessary to obtain unbiased and sufficient data
 5. Produce a research proposal, research paper and oral presentation that convincingly communicate your research to an audience with a general biology background
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5 Teaching and Learning Activities

There are no traditional lectures or labs for this course. **Because this is a 1.0 credit course, students should expect to invest 20 hours per week in their research project. Note that times and locations could change due to room availability and changes in the university's public health guidelines.**

5.1 Seminar

Fri, Sep 9, 2:30 PM - 4:20 PM

Topics: First Class - Introduction and planning

- Location: SSC 3317

Fri, Sep 23, 2:30 PM - 5:20 PM

Topics: Second Class - Oral presentations of proposal development

- Location: SSC 3317
- Also Due: Project Approval Form; One-page Research Summary

Fri, Oct 28, 2:30 PM - 5:20 PM

Topics: Third Class - Oral presentation of research progress

- Location: SSC 3317

Fri, Nov 25, 2:30 PM - 5:20 PM

Topics: Last Class - Final Oral Presentations

- Location: SSC 3317*
- *Location may change depending on audience size

6 Assessments

6.1 Marking Schemes & Distributions

See weights associated with each assessment.

6.2 Assessment Details

Reflective Essay #1 (2.5%)

Date: Sun, Sep 18, 11:59 PM, Submit to corresponding folder in Dropbox

- A 1 - 2 page essay outlining long-term career goals, goals for the research course, anticipated challenges and steps to meet these challenges
- Evaluated by Course Coordinator

Oral presentation of proposal development (2.5%)

Date: Fri, Sep 23, 2:30 PM - 5:20 PM, SSC 3317

Learning Outcome: 1, 2, 4

- A 5-minute oral presentation on the state development of your proposal, with input from classmates
- Also Due: Project Approval Form; One-page Research Summary
- Evaluated by Course Coordinator

Written Proposal (12.5%)

Due: Fri, Oct 7, 11:59 PM, Submit to Dropbox on Courselink

Learning Outcome: 1, 2, 3, 4, 5

- A formal research proposal, including background, motivation, identification of gap in knowledge, statement of research question or hypothesis, methods, anticipated results and statement of potential significance or contribution to the advancement of the field of inquiry
- Evaluated by Course Coordinator

Oral Progress Report (5%)

Due: Fri, Oct 28, 2:30 PM - Fri, Nov 4, 5:20 PM, SSC 3317

Learning Outcome: 1, 2, 3, 4, 5

- An oral presentation of progress and plans, with input from classmates
- Evaluated by Course Coordinator

Final Oral Presentation (20%)

Date: Fri, Nov 25, 2:30 PM - 5:20 PM, SSC 3317*

Learning Outcome: 1, 2, 3, 4, 5

- A 12-minute presentation of research project in the form of a traditional scientific talk, with question period

- Evaluated by Course Coordinator
- *May change location to accommodate audience size

Written Final Research Report (40%)

Due: Sun, Dec 4, 11:59 PM, Submit to Dropbox on Courselink

Learning Outcome: 1, 2, 3, 4, 5

- Evaluated by Advisor and Second Reader
- The grade for the final written report will be an average of the grades submitted by the advisor and the second reader. The report is to be submitted in the specific journal style agreed upon by the student and advisor at the beginning of the semester and recorded on the Project Approval form.
- The final research paper for students enrolled in IBIO*4500/4510 in both the Fall and Winter semesters will be considered for one of the Bryant Family Research Scholarships.

Reflective Essay #2 (2.5%)

Date: Sun, Dec 11, 11:59 PM, Submit to corresponding folder in Dropbox

- A concluding reflective essay on your experience and lessons learned to carry forward
- Evaluated by Course Coordinator

Research Effort (15%)

Date: Grades due to course coordinator: Wednesday, Dec 14

Learning Outcome: 1, 2, 3, 4

- Evaluated by Advisor
 - The requirements and the breakdown for this portion of the mark are to be agreed upon by the student and advisor, and recorded on the Project Approval form.

7 Course Statements

7.1 Responsibilities of the Students

It is the responsibility of the student to:

- Find a thesis supervisor and second reader. Prospective students are encouraged to gauge their areas of research interest, survey the departmental web site highlighting the research interests of faculty, and approach faculty possessing similar interests. A second reader for the final project report can be selected in consultation with the advisor but must be a faculty member at the University of Guelph.
- Familiarize themselves and their advisor with the procedures and the roles and responsibilities of the course. The student should consult with their advisor and the course coordinator on all aspects of the course, including the guidelines and requirements for the research proposal, the oral progress report, and the written final report. Each student is strongly encouraged to meet with their advisor before or at the beginning of the course to review the procedures and the roles and responsibilities, and to discuss expectations in light of the evaluation components of the course. If conflicts arise between the student and the advisor, the student has the responsibility and right to ask the course coordinator to intervene.
- Keep their advisor and the course coordinator informed of their progress during the semester. The student is expected to (i) monitor their day-to-day research progress, (ii) keep their advisor and the course coordinator aware of any concerns that are important to the success of the proposed research, and (iii) rely on their advisor for guidance on how to troubleshoot any challenges that may arise during the research.

7.2 Responsibilities of the Faculty Advisor

It is the responsibility of the advisor to:

- Ensure the student is clear about what is expected from them on a week-to-week basis over the duration of the project, and ensure that their expectations are consistent with the contents of the course description. To be eligible to take on a project student, advisors cannot be away from campus for an extended period of time (e.g. on research/study or parental leave). A minimum of 30 minutes of face to face contact time per week, on average, is recommended. It is the advisor's role to offer advice and support to the student as challenges arise with the project, and to communicate and reinforce their expectations regarding the conduct of the student in the lab or field. As appropriate to the discipline and research project, the advisor will provide protocols used to track research

progress, set up experiments, and collect, enter, validate, and analyze data.

- Ensure the student is supported adequately and appropriately to complete their research successfully. Depending on the project, this preparation could include (i) providing specialized training (e.g. electrofishing), (ii) ensuring access to key rooms, equipment, literature, or data, and (iii) overseeing the acquisition of approval from the Animal Care or Research Ethics Committees.
- Ensure the student is working safely in the lab or field. Project students are required to take the three CBS safety training modules. In addition, advisors are required to review the Safety Orientation Checklist with the student. Students working in the field must also submit the Field Research Safety Plan and the Field Trip Waiver and Contact List forms.
- Ensure the student appropriately balances their time between planning, data collection, and write-up. Laboratory work and data collection should cease by mid-November to provide students adequate time to analyze their data, write an initial draft, solicit feedback from the advisor, and revise the final report prior to submission.

7.3 Responsibilities of the Course Coordinator

It is the responsibility of the course coordinator to:

- Ensure students are familiar with the organization of the course. This includes organizing initial classes to review the course's organization, evaluation requirements and methods of assessment, key forms, and the schedule of important dates. It will also include scheduling of class presentations.
- Ensure students have a secondary source of advice and guidance. This can include advising the class on how to communicate effectively with their advisors, or providing individual counselling in the event of problems that cannot be solved between a student and their advisor.
- Ensure students are assessed with similar rigour across advisors. The course coordinator will act as a contact for the advisors regarding course requirements and evaluation.

7.4 Lab & Field Safety

- It is the student's responsibility to ensure that they participate in safety training and obtain safety instruction as required by the faculty advisor and as

appropriate to the techniques and equipment to which they will be exposed (e.g., radiation safety, biosafety, first aid/CPR, autoclaves, centrifuges, electrophoresis, etc). Students conducting work in the laboratory or field must demonstrate that they have completed the online modules for CBS Health and Safety Training. This is a requirement of the course.

- Advisors are required to provide a work-place specific Safety Orientation with project students and record it on the appropriate form. In addition, students whose research will be conducted under field conditions must, with the assistance of the faculty advisor who will sign it, fill out the Field Research Safety Plan and the Field Trip Waiver and Contact List. Copies of forms are due to the course coordinator.
- Students whose research involves live, non-human vertebrates must comply with the Animals for Research Act of Ontario and University Animal Care Policies. Before proceeding with such research, permission must be obtained from the University Animal Care Committee by completing and returning the Animal Utilization Protocol form available from the Department of Integrative Biology office. Students whose research involves human subjects must consult the Research Ethics website at <http://www.uoguelph.ca/research/humanParticipants/index.shtml> and fill out an application form available at <http://www.uoguelph.ca/research/forms/index.shtml>.

7.5 Missed Course Requirements & Grading

- Students who are unable to meet a course deadline for a graded component because of illness or compassionate reasons must request Academic Consideration as soon as possible by advising the course coordinator in writing, with their name, id#, and email contact. If approved, alternate deadlines will be arranged.
- Deadlines for submission of written assignments that are evaluated by the advisor and second reader cannot be altered by the advisor. Written assignments and oral presentations that are submitted after the deadlines indicated in the Evaluation Table will not be accepted unless Academic Consideration for illness or other compassionate grounds has been approved by the course coordinator. Late submissions can also incur a 10%/day grade penalty.

- See the undergraduate calendar for further information on regulations and procedures for Academic Consideration:
<http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

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.
