IBIO*4521 Thesis in Integrative Biology

Fall 2019
Section(s): C01

Department of Integrative Biology
Credit Weight: 1.00
Version 3.00 - September 16, 2019

---

1 Course Details

1.1 Calendar Description

This course is the first part of the two-semester course IBIO*4521/2. Refer to IBIO*4521/2 for course description. This is a two-semester course offered over consecutive semesters F-W. When you select this course, you must select IBIO*4521 in the Fall semester and IBIO*4522 in the Winter semester. A grade will not be assigned to IBIO*4521 until IBIO*4522 has been completed.

Pre-Requisites:	12.00 credits
Restrictions:	Normally a minimum cumulative average of 70%. Permission of course coordinator.

1.2 Course Description

This course is a two semester (F,W) undergraduate thesis project in which students conduct a
comprehensive, independent research project in organismal biology under the supervision of a faculty member in the Department of Integrative Biology. Projects must be planned in advance and involve a thorough literature review, a research proposal, and original research communicated in oral and poster presentations, and in written, publication quality documents.
The research can be practical or theoretical in nature. This two semester course offers students the opportunity to pursue research questions and experimental designs that cannot be completed in the single semester research courses (IBIO*4500/4510).
Restrictions: Enrollment is open to students in semesters 7 and 8 who have successfully completed a minimum of twelve (12) science credits. A minimum cumulative average of 70% overall is required for approval to register.

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 of the semester in which the project is initiated. This is a two-semester course offered over consecutive semester F-W. When you select this course, you must select IBIO*4521 in the Fall semester and IBIO*4522 in the Winter semester. A grade will not be assigned to IBIO*4521 until IBIO*4522 has been completed.

The project advisor must be a faculty member in the Department of Integrative Biology. The second reader may be a faculty member from Integrative Biology or from another department at the University of Guelph, or a sessional lecturer, postdoctoral fellow, or staff member from Integrative Biology. Faculty who will be on leave during either semester may not serve as advisors or second readers.

Because it is a 2 credit course, students should expect to invest 20 hours per week over the two semesters in their research project

1.3 Timetable

Meet as required

1.4 Final Exam

There is no final exam

---

2 Instructional Support

2.1 Instructional Support Team

Instructor:	Ryan Gregory
Email:	rgregory@uoguelph.ca
Telephone:	+1-519-824-4120 x53598
Office:	SSC 2480
Office Hours:	By Appointment Only

---

3 Learning Resources

Text book: There is no required textbook for this course.

Courselink site: Materials relevant to the course including grading rubrics will be posted on the IBIO*4521/4522 Courselink site. In addition, research proposals, progress reports, final research papers and powerpoint files for oral presentations will be submitted via Courselink dropboxes. Details will be provided as the deadlines approach.

There are no traditional lectures or labs for this course.

---

4 Learning Outcomes

4.1 Course Learning Outcomes

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

1. At the end of this course, the successful student will be able to work independently and efficiently under the guidance of a faculty member to achieve the following learning outcomes: **1.** Design a self-guided research question and project at the level expected for a fourthyear
independent research thesis within the constraints imposed by the course (two semesters, 2 credits, 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 analyse data. **4.** Construct and efficiently conduct an appropriate study design by actively employing
sampling and modeling techniques (empirical or theoretical) necessary to obtain unbiased and sufficient data. **5.** Create a research proposal, annotated bibliography, poster and oral presentations, and
final project manuscript that convincingly communicate the proposed research and research findings to experts and to an audience with a general biology background. **6.** Create individual course learning goals relevant to the student's longer-term academic and career interests and reflect on and communicate the achievement of these goals over the course.

---

5 Teaching and Learning Activities

5.1 Activities

Semester 1

Oral Presentation: 10 minute presentation to lab describing project background and rationale, hypotheses to be tested, description methods, and expected time-line for project completion.

Self assessment 1: 1-2 page reflection that summarizes the student's long-term goals, goals for the course, what they anticipate could go wrong with their project and how they will respond if it does.

Written proposal: Formal document providing project background, rationale of project, hypotheses to be tested, and methods to be used. Should also include a timeline that will enable project to be completed.

Effort check: Discussion with faculty supervisor regarding progress in the lab and current challanges. Faculty should describe to student what their expectations are.

Annotated bibliography: Document listing all references that are relevant to the project (Rationale, Background, methods etc.) with a brief explanation as to why they are relevant.

Poster Presentation and Q&A. Poster will summarize all work completed in semester 1 including description of methods, and any data. Poster will be presented during organized session and each student will be questioned by three faculty. More information will be provided at later date.

Self Assessment 2: 1-2 page reflection that describes how/if the student is on track to achieve their stated goals. How things have changed since last assessment. Description of any new challenges faced should be described and how these have been overcome.

Semester 2

Oral Progress Report: 10 minute presentation to lab providing brief project background, progress so far, challenges faced, and predicted outcomes.

Effort Check: Discussion with faculty supervisor regarding progress in the lab and current challenges. Faculty should discuss with student if they are meeting expectations previously established.

Manuscript draft: Complete draft of publication ready manuscript, in required format, that will enable supervisor to provide feed back.

Oral Presentation: 12 minute presentation that provides background and rationale of project, states the hypotheses tested, describes the methods used, summarizes the results and discusses the significance/relevance of the work.

Final Manuscript: Publication ready manuscript describing project in format agreed to with supervisor.

Self Assessment 3, 3-4 page reflection that describes if the students achieved their stated goals. Description of challenges faced and how these were overcome. Student should also describe what they would do differently if they had to do it again, what did they learn about themselves, and what are the next steps in their long-term goals.

---

6 Assessments

6.1 Marking Schemes & Distributions

Grading Responsibilities

	Advisor	Second Reader	Course Coordinator	Additonal Faculty
Semester 1				
Oral Presentation	X			
Self Assessment 1			X	
Written Proposal	X	X		
Effort Check	X			
Annotated Bibliography	X			
Poster Presentation+QA	X	X		X
Self Assessment 2			X	
Effort	X			

	Advisor	Second Reader	Course Coordinator	Additonal Faculty
Semester 2				
Oral Progress Report	X			
Effort Check	X			
Manuscript Draft	X	X		
Oral Presentation	X	X	X	
Final Manuscript	X	X		
Self Assessment 3			X	
Effort	X			

6.2 Assessment Summary

Semester 1 Assessment	Weight (%)	Due Date
Oral Presentation*	5	Oct 4th
Self Assessment 1[a]	--	Oct 4th
Written Proposal[b]	20	Oct 11th
Effort Check[a]	-	Oct 11th
Annotated Bibliography [c]	15	Nov 2nd

Semester 1 Assessment	Weight (%)	Due Date
Poster Presentation + Q and A [b,d]	35	~Nov 28th
Self Assessment 2[a]	10	Nov 30th
Effort[a]	15	Nov 30th
	100%	

Semester 2 Assessment	Weight (%)	Due Date
Oral Progress report	10	Jan 17th
Effort Check[a]	--	Jan 17th
Manuscript Draft[b]	10	March 2nd
Oral Presentation[c]	15	~March 25th
Final Manuscript[b,c]	35	April 6th
Self Assessment[a]	10	April 10th
Effort[a]	20	April 10th
	100%	

*To be done in lab meeting and graded by the supervisor.

[a] Assignment will be laddered with final grade at the end of the semester.

[b] The assignment grade will be an average of grades submitted by multiple assessors. See Grading Responsibilities above.

[c] The report is to be submitted in the form of a publication-ready manuscript. The specific journal and style is to be agreed upon by the student and advisor at the beginning of the course and recorded on the Project Approval form.

[d]The poster presented at the end of the first semester will summarize all work completed to date. Further details will be provided at a later date.

All course documents need to be submitted via courselink by 11:59 PM on due date. All documents should be a word document.

---

7 Course Statements

7.1 Individual Responsibilities

It is the responsibility of the student to:

• find a thesis supervisor and a second reader. 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 committee member can be selected in consultation with the supervisor, but must meet the course criteria for second readers (see above).

• 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 dates for the course assessments. Each student is strongly encouraged to meet with their advisor before or at the beginning of each term to review the procedures and the roles and responsibilities. Each student is required to meet with their advisor to self-assess their progress and review effort at designated times during 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 committee 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 committee and the course coordinator aware of any concerns that are important to the success of the proposed research, and (iii) rely on their committee for guidance on how to troubleshoot any challenges that may arise during the research.

• Conduct their field and/or laboratory research in a safe manner consistent with lab and university safety policies described in greater detail below (see Field and Lab Safety)

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 syllabus. 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 feedback on the student's effort and progress and provide protocols to 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• 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-March to provide students adequate time to analyze their data, write an initial draft, solicit feedback from the thesis committee, and revise the thesis prior to submission.

It is the responsibility of the second reader to:
• meet as needed with the student to offer feedback, advice, encouragement, and criticism as appropriate. This includes meetings requested by the student, within reason, and the poster paper (semester 1) and final oral (semester 2) presentations.

It is the responsibility of the course coordinator to:
• notify advisors and second readers of the dates of poster presentations (semester 1) and final oral presentations (semester 2) at the beginning of the semester.

• 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 committees, or providing individual counseling in the event of problems that cannot be solved between a student and their advisor.

• act as a contact for the advisors regarding course requirements and evaluation, to ensure students are assessed with similar rigor across supervisors.

7.2 Field and Lab 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. Students will be contacted by email early in the semester and instructions on what to do will be provided at that time. Please note that the 3 online modules must be completed within 1 week of receiving the email message. 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. Forms are due to the course coordinator at the second class meeting.

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.

7.3 Missed Course Requirements and 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 cannot be altered by the advisor and the second reader. Written assignments that are submitted after the deadlines indicated in the Methods of Assessment table will not be accepted unless Academic Consideration for illness or other compassionate grounds has been approved by the course coordinator. 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/

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

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 book their exams at least 7 days in advance and not later than the 40th Class Day.

More information can be found on the SAS website
https://www.uoguelph.ca/sas

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
