Biology Honours Thesis
BIOL 407T and 408T

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Evaluation	Grade Mechanism	Percentage
Research effort	Determined by (internal) supervisor(s)	40
Committee meeting	Pass or Conditional Pass*	10
Seminars	Signup sheet	5
Thesis quality	Determined by Thesis Committee	35
Thesis defence	Determined by Thesis Committee	10
Research symposium	Required, but not marked	0
	Total	100

* If you receive a conditional pass, the mark will be given after the follow-up work has been completed to the satisfaction of the (internal) supervisor(s).

Part 1: Course Information

Course Description

Research-based, two-semester course that requires Honours candidates to undertake a research project under a supervisor's mentorship, obtain and analyze data, and present their research in a thesis format. You can work with an external co-supervisor, but you also need an internal co-supervisor who is in the Biology Department. Contact the Honours Coordinator to discuss external projects and obtain a copy of Guidelines for External Co-Supervisors before you start your research. Students are encouraged to talk with their (co-) supervisor(s) early in their research to identify shared goals.

Thesis Committee

The Honours Coordinator will assign you a thesis committee consisting of three members, including your supervisor(s). The primary role of the thesis committee is to help guide your research during a Committee Meeting and in a Thesis Defence.

Course Materials & Requirements

Candidates must complete a minimum of 60 credit hours in the Honours program as follows: the Biology Core, BIOL 4023, both BIOL 407T and 408T, and 18h additional BIOL courses at the 3000-4000 level, each completed with a minimum grade of B-; MATH 1253 or MATH 2233, MATH 2243, CHEM 1013 and CHEM 1023, each completed with a minimum grade of C-.

Course Structure

Detailed information on the program can be found on the Biology website. The Biology Honours program includes a two-semester Honours Thesis course (BIOL 407T and BIOL 408T), which spans the fall and winter semesters. Most candidates undertake a research project beginning in May, but candidates may begin in September or January depending on the project.

Part 3: Assessment and Grading

It takes longer to write a thesis than you might expect. The following are guidelines for completing thesis milestones. Some deadlines are course requirements, while other deadlines will be provided by your supervisor. Requirements and instructions for undergraduate theses are available through the Research, Innovation and Graduate Studies website.

Item	Date(s)	Required
Identify a supervisor	3rd Year[1]	
Apply for scholarships	Acadia HSRA[2] and NSERC USRA applications are due the 1st week of February, and both require time to complete. Start early.	
Initiate research	Generally in May[3], but can be anytime in the summer. In some circumstances, students may start in the fall or winter term; please discuss the dates below with your supervisor(s) if that is the case.	
Biology Department Seminars	Attend ten throughout the year	✔
Committee Meeting	Last two weeks of September to the first week of October	✔
Introduction/ Literature review	October	
Methods	End of November	
Results	End of January	
Complete draft of thesis to supervisor	Third week of February	✔
Thesis defence	First three weeks of March[4]	✔
BioFeedback (research symposium)	Last full week of classes	✔
Thesis due to Research, Innovation and Graduate Studies	Date varies - see Research and Graduate Studies website	✔

1 Seeking a supervisor in the fall may help you and your supervisor(s) apply for funding.

2 You must enroll in the BScH program with the Registrar's Office before you can apply for an HSRA. Please ask your supervisor to email the Biology Administrative Assistant about this before the HSRA application is submitted.

3 The date of initiation of research will be decided in consultation with your supervisor(s).

4 The thesis defence committee must have a copy of the thesis 5 working days before the defence.

Student Learning Outcomes

1) Identify a research question and develop a research plan with your supervisor(s).
2) Conduct research including collecting, analyzing and interpreting data.
3) Explain your research in a written thesis and with presentations.
4) Develop professional skills such as teamwork, scientific communication, analytical skills and ethical scientific practices.

How to Meet the Learning Outcomes

Honours candidates should meet and/or communicate often with their supervisor(s) to discuss progress, review data, analyses and writing, and plans for thesis completion and defense.

Part 2: Course Plan

Research Effort

The mark for research effort will be determined by your internal supervisor based on your performance throughout the Honours program. For candidates who are working with an external co-supervisor, the internal co-supervisor is responsible for this mark following discussion with the external co-supervisor.

Committee Meeting

The focus of this meeting is a comprehensive discussion on how your thesis fits into the broader scientific landscape. You will start the meeting with a brief overview of your research, including progress to date and plans for completion (~ 10 min). The following discussion is meant to provide you with an opportunity to discuss your thesis including how your research fits into biology overall, connections with other areas of biology that you have studied, and directions for future discovery.

The discussion is graded Pass or Conditional Pass. A Conditional Pass means that follow-up work will be required by your thesis committee.

Biology Department Seminars

Candidates are required to attend ten biology seminars throughout the academic year. Candidates are responsible for recording their attendance in the attendance book. Other academic presentations may qualify such as attending: seminars in other departments, conferences, Blomidon Naturalists Society, panel discussions, etc., if approved by your supervisor. You may be asked to comment on these seminars in general terms at your thesis defence.

Research Symposium

This celebration of your undergraduate research in the Biology Department gives you a chance to present your research findings as part of a symposium.

Thesis Defence

A thesis defence is a wonderful opportunity for you to discuss your research with your Thesis Committee. First, you will be asked to present your research (~ 10 min). Next, you will be asked to discuss and defend your research approach, analysis, interpretation and how it fits into the broader scientific landscape. Edits and corrections will likely be required, this is a typical part of the scientific process, so give yourself time to make these revisions after the defence.

Rubric for Thesis Defence

	A **Exemplary**	**B** **Competent**	**C** **Developing**	**D** **Conditional Pass**
Overall Understanding	Shows a deep/robust understanding of the material with a fully developed argument per the categories below.	Shows a limited understanding of the material, not quite a fully developed argument per the categories below.	Shows a superficial understanding of the material, argument not developed enough per the categories below.	Shows no understanding of the material and no argument per the categories below.
Argument	Clearly articulates a position or argument.	Articulates a position or argument that is incomplete or limited in scope.	Articulates a position or argument that is disjointed or ambiguous.	Ideas are disjointed and/or do not flow logically.
Evidence	Presents sufficient, relevant and accurate evidence to support argument.	Presents evidence that is mostly relevant and/or mostly accurate.	Presents evidence that is somewhat inaccurate and/or irrelevant, but corrects when prompted.	Doesn't present enough evidence to support argument, even when prompted repeatedly.
Prompting	Did not have to prompt with probing questions.	Prompted minimally (one or two probing questions).	Prompted a lot (a series of probing questions).	

* Modified from Grading Rubric for Oral Exams by Susan Ambrose, Carnegie Mellon University

Part 4: Course Policies

For both lab and field-based research, candidates are required to have WHMIS (Workplace Hazardous Materials Information System) training, and may be required to have CCAC (Canadian Council on Animal Care) training, first aid training, and/or approval of the Acadia University Research Ethics Board, depending on your research project. Consult with your supervisor(s) regarding these requirements.

If applicable, candidates must discuss policies on research travel, boating safety, and/or expectations for external co-supervisors with their internal co-supervisor and make sure all appropriate documents are completed.

Training and/or approvals are required before your research can begin.

Part 5: University Policies

University policies are available in the Acadia University Academic Calendar or through the Registrar's website: https://registrar.acadiau.ca/welcometotheregistrarsoffice.html

Equity, Diversity and Inclusion

Acadia University is committed to becoming a culturally safe and anti-oppressive community. This can only be achieved where there are simultaneous efforts to eliminate all forms of discrimination and harassment from our campus community, including the elimination of all discrimination, harassment and violence based on one's identity, including but not limited to, gender, race, class, ethnicity, sexual orientation, disability, gender identity, gender expression, and Indigeneity. The policy against harassment and discrimination, and resources for students who believe they may have experienced, or witnessed, discrimination or harassment, are available here: https://www2.acadiau.ca/student-life/equity-judicial/equity.html

Last Drop Day

Last day to drop a course and receive a "W". Please check the Acadia University calendar dates, which are available here: https://registrar.acadiau.ca/AcademicCalendars.html

Inform Your Instructor of Accommodations

Acadia University is dedicated to improving access to campus life for all students with disabilities. While we attempt to ensure that all courses are accessible, we recognize that there are barriers that need to be addressed on an individual basis. Students who require accommodations to complete coursework or otherwise fully participate in class should contact Accessible Learning Services directly as soon as possible. https://www2.acadiau.ca/student-life/accessiblelearning.html

The Use of Animals in Teaching and Research

The use of animals in teaching and research at Acadia University is done in accordance with guidelines on the care and use of animals published by the Canadian Council on Animal Care (CCAC). For more information on the CCAC, please visit their website at http://www.ccac.ca

Commitment to Integrity

It is standard practice in Biology to check exams and assignments for cheating and plagiarism. Cheating in the class and/or lab, including plagiarism, will not be tolerated. Please read the appropriate sections of the current Acadia University Academic Calendar: https://registrar.acadiau.ca/AcademicCalendars.html

Information on copy-write and course content from Acadia University is available through the Vaughan Memorial Library: http://libguides.acadiau.ca/c.php?g=433650&p=5027078

The spoken and written course content (including the syllabus, handouts, lectures, presentations, labs, assignments, quizzes, tests, and exams) are the intellectual property of the instructor and may only be copied for personal use. Sharing these materials or uploading them where they may be accessed by others is a violation of copyright. If you wish to make audio, video, or photographic recordings in class, you must first obtain the consent of the instructor and of any other persons (e.g., guest speakers, other students) who may be captured in such recordings. In the case of personal use by students with disabilities, the instructor's consent shall not be unreasonably withheld.

Part 6: Program Learning Outcomes

Foundations of knowledge		**Course specific examples**	**Proficiency** 1-Introduction 2-Reinforcement 3-Proficient
Scientific method, inquiry and hypothesis testing	Find, understand and apply information from the literature; understand how to use the scientific method to examine problems from different perspectives	Critical review of thesis-related literature; planning experiments, study or other research methodology; gain new perspectives from attending Biology Seminar Series	3
Historical concepts and contributions by important figures	Explain foundational concepts in biology, Two-eyed Seeing, and ethical implications of scientific discoveries	Explain contributions of key researchers in the discipline of your thesis	3
Biodiversity and ecology	Understand the genetic, taxonomic and ecosystem levels of biodiversity; focus on SW Nova including the Acadian Forest and Bay of Fundy ecosystems	(Depends on thesis)	
Genetics and evolution	Understand the chemical basis of heredity, genetics and genomics; integrate concepts across disciplines to understand evolution	(Depends on thesis)	
Human and environmental health	Understand form and function in health and disease within a One Health framework, integrating human and environmental health	(Depends on thesis)	
Lab and field skills			
Experimental design	Gain experience in applying the scientific method	Design and defend the scientific approach used in your thesis research	3
Safety	Work safely and productively in lab and field settings	(Depends on thesis)	
Lab skills	Gain experience with basic and advanced lab techniques and understand their application in research, health science and industry	(Depends on thesis)	
Field skills	Gain experience in basic and advanced field skills and understand their application in ecology, conservation biology and environmental change	(Depends on thesis)	
Data acquisition, analysis and interpretations	Collect data, present results both qualitatively and quantitatively, and interpret outcomes in light of the literature	(Depends on thesis)	
Statistical analysis	Use R and or other programs to analyze biological data	(Depends on thesis)	
Professional skills			
Ethical practices	Demonstrate ethical conduct, apply principles of academic integrity and understand the principles of EDI in science	Discuss ethical considerations and norms for your discipline; demonstrate good scientific practices	3

Collaboration and group work	Work effectively in groups within and across disciplines	Be an active contributor to lab and field work; work effectively with thesis committee and lab mates	3
Critical thinking	Analyze and evaluate information to make science-based decisions	Understand greater implications of your research.	3
Computer proficiency	Use common and discipline- specific software	MS Word and Excel, bibliography software (e.g., Zotero), plus thesis-specific software	3
Scientific communication	Communicate science effectively to both scientific and general audiences	Thesis writing, learn communication skills by attending seminars, give a public presentation (e.g., Biofeedback)	3