

**BIOL 4500 Research Thesis  
Fall-Winter 2021-2022  
COURSE OUTLINE**

**Instructor:** Dr. Laura Weir, Associate Professor and Acting Chair

Biology Department

**Contact:** Email: [laura.weir@smu.ca](mailto:laura.weir@smu.ca)

Office Location: S312

Phone: 902-420-5646

**Office Hours:** Tuesday 1:00-3:00PM

Wednesday: 2:30-4:00PM

or email me if you would like to set up a different time

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**Course Site:** There is no course site for BIOL 4500. Please see syllabus for BIOL 4549 for details on the Brightspace course site for the Biology Honours Seminar.

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**Course Description**

Each student will work with a research supervisor who will guide them in the formulation of a research proposal, methods to be followed, and in the analysis and write-up of the research findings. The student will submit a thesis and presents it orally.

**6 credit hours**

**Pre-requisites:** *BIOL 3308 and Honours standing*

**Required Materials:** *none*

**Course Content**

The course content is exclusively related to the Honours project research, the written thesis and presentations. There are no scheduled classes or labs for this course. Students must organize two virtual Progress Update Meetings with their supervisor and reader, one before early October and one before the end of January. See the attached "Biology Honours Guidelines" for details on requirements and expectations.

All Biology Honours students are expected to take BIOL 4549 (Honours seminar) concurrently with BIOL 4500. Please refer to the BIOL 4549 syllabus for details on class times and assignments for that course.

## Marking Scheme (Academic Regulation 4): see Honours Guidelines (following section) for details

Component	Weight (%)	Dates/comments
Progress update meetings	0% but must achieve satisfactory rating	1 <sup>st</sup> meeting before October 8, 2021 2 <sup>nd</sup> meeting before January 28, 2022
Oral thesis presentation and defense	25%	during Winter 2022 final exam period
Written thesis	75%	April 1, 2022

### Learning Outcomes

By the end of the Honours Research Thesis, students should be able to:

1. Demonstrate familiarity with the current research literature in their field
2. Demonstrate independence and initiative in gathering information
3. Complete a literature review of their thesis topic (usually as part of the introduction section of the written thesis)
4. Work with a supervisor to develop a testable research question and study design
5. Collect data, make observations and analyze data to answer the research question(s) or test hypotheses
6. Follow directions from the research supervisor, complete tasks on time, attend research meetings (as indicated by the supervisor)
7. Prepare and revise a written thesis documenting their Honours research
8. Orally defend their thesis in public

### Academic Integrity

As in all courses, plagiarism and cheating will not be tolerated. You must hand in your own work, written in your own words. Plagiarism will be dealt with according to policies outlined in the Academic Calendar. It is your responsibility to familiarize yourself with Saint Mary's policies on Academic Integrity by consulting the "Academic Integrity and Student Responsibility" (pg 14-21) and "Academic Regulations" (pg 22-37) sections in the Academic Calendar and become well informed of the consequences of dishonest behaviour.

### Privacy Information

Marks are never posted publicly. Tests and quizzes will be returned to you directly during lecture or lab, and be available for pick up during office hour in case of absence. You may review Freedom of Information / Protection of Privacy (FOIPOP) issues at <http://www.smu.ca/administration/foipop/faq-student.html>.

### Accessibility

As part of *Saint Mary's University Core Values* statement, the University is committed to accessibility, diversity and the provision of a positive and supportive learning environment through the effective integration of teaching and research. The Atlantic Centre establishes individualized support service programs to facilitate the participation of students with physical, medical, and learning disabilities, and to provide students with disability accommodation services and supports. Students are encouraged to seek more information by visiting the Centre, or its website:

<http://www.smu.ca/administration/atlcentre/access.html>. All communication with the Atlantic Centre or with the instructor regarding accommodation services and supports is kept confidential.

### **In Case of Emergency**

From the SMU Safety Committee: “Saint Mary’s classrooms, in the Sobey Building, Loyola Academic, Library, Atrium and **Science**, are equipped with a two-stage alarm that will provide both an alarm and verbal instructions over the loudspeakers for a fire situation. [...] In the event of an emergency, all the above noted buildings are equipped with loudspeakers and you will be told to evacuate the building or seek shelter in place (your current location). It is important that you follow the instructions given through the alarm system. If you are instructed to evacuate, leave immediately.” The emergency phone numbers to use are: 911 or x5000 (internal security). If you call 911, then call 420 - 5000 to update the SMU Security people ASAP so they can coordinate quickly. You may review SMU’s emergency procedures at <http://www.smu.ca/administration/security/procedures.html>.

## Biology Honours Guidelines

### **Honours Requirements**

Students completing Honours must meet all requirements of the Major in Biology, and additionally complete the Honours Seminar (BIOL 4549; 6 credit hours), the Research Thesis (BIOL 4500; 6 credit hours), Biostatistics (BIOL 3308), and three additional credit hours in BIOL at the 4000-level for a total of 30 credit hours of BIOL electives (including BIOL 3308) at the 3000 and 4000-level, with at least 12 credit hours in each of the 3000 and 4000 levels. Honours students must also achieve a minimum degree GPA of 3.00 (Faculty of Science Regulation 13).

### **Admission to Honours**

Students require a minimum CGPA of 3.00 to be admitted to the Honours program. Students must first find a supervisor for their Honours research before applying. Supervisors can be full-time or adjunct faculty in Biology or other departments at SMU provided that the topic of the Honours research is biological. Students are encouraged to begin contacting potential supervisors as early as possible (recommended: in their second year, or fall of their third year) as projects and funding are limited.

Students who wish to undertake Honours research with supervisors external to SMU must also find an internal supervisor (full-time faculty in Biology).

The application requires a form to be completed (see the Service Centre to obtain the form) and signed off by the chair of the Biology Department. When you are accepted to the Honours program, your registration status will change from "major" to "Honours".

### **Research Supervisor and Reader**

Each student needs a supervisor and a reader (often called "second" reader). Supervisors and readers fall into three categories:

Internal: has full-time faculty position in Biology at SMU

Adjacent: has adjunct position in SMU Biology or full-time faculty position in another SMU department

External: works for other institutions with no position at SMU

If your supervisor is internal, your reader can belong to any of the three categories.

If your supervisor is adjacent, your reader must be internal.

If your supervisor is external, you will also need an internal supervisor but your reader can belong to any of the three categories.

Your reader will be determined at the beginning of September by the BIOL 4500 instructor with input from your supervisor. Adjacent supervisors are asked to serve as a reader for one Honours student with an internal supervisor for each Biology Honours student that they are supervising in the current academic year.

### **Research Activities**

Depending on your supervisor, your field and the specific setting of your group, you may begin your Honours research the summer prior to registration for the Research Thesis (BIOL 4500) and Honours Seminar (BIOL 4549). This can be a paid or a volunteer position. During this time you may also have other duties not related to your Honours research. Other Honours projects may be completed entirely

between September and April. Students are not normally paid for this work as it constitutes coursework toward BIOL 4500 and BIOL 4549.

Students will be given safety training on general lab procedures and any specific techniques required to complete the Honours research. The supervisor is generally responsible for this but other members of the supervisor's research group may also assist in providing this training to Honours students. This training may extend to field work and any other special settings where an Honours student may be required to do work. Honours students should be aware that if they perceive an unsafe situation in their workplace, they have a duty to report this to their supervisor; they also have the right to refuse unsafe work. If the Honours research requires work with animals, the supervisor is responsible for instructing the student in proper animal care protocols prior to beginning the work.

### **Communication with Your Research Supervisor**

If your supervisor does not schedule regular meetings with you, feel free to set up a schedule with them. Make sure that if you do not understand what your supervisor expects of you that ask them for clarification.

### **Dealing with Conflicts**

If you encounter difficult situations involving your lab mates or supervisor, including disagreements about your duties, your research or other issues involving your research thesis, your first approach should be to have an in-person meeting with your supervisor. If your supervisor is external to the university, you also have an internal supervisor and this person should be your first line of inquiry if you are having issues with an external supervisor. If you have a direct conflict with your supervisor or if your supervisor is unavailable, there are a few other options. The chair of Biology is automatically the course instructor for BIOL 4500 and can be contacted to meet with you to help you resolve any such situations. The instructor(s) for BIOL 4549 are also good options for advice and support in case you run into a conflict situation. If any of these options won't work for you, the Science Advising Centre is a great option. The Science Advisors can also put you in touch with an Associate Dean if your issue requires it.

### **Description of Course Components for BIOL 4500**

#### **Progress Update Meetings (fall and winter)**

Students will organize two one-hour meetings with their supervisor(s) and reader (one before October 8; the second before January 28). The student will make a brief (5-10 minutes) presentation on their progress to date. The nature of the presentation can be determined by the supervisor in discussion with the student, but should contain a general introduction to the student's topic, a clear statement of research goals or questions, an outline of methods (to be) used, a summary of progress to date and a timeline for finishing.

The purpose of the meeting is to ensure that both the supervisor and reader evaluate the student's progress early in the program, and identify any potential problems with the project. After the student's presentation there will be an opportunity for informal discussion of the project, anticipated issues and possible solutions. The reader and supervisor(s) will meet separately to fill out the Progress Update form. This includes a brief written summary of the student's progress, prepared by the supervisor and an evaluation: satisfactory; needs improvement. The results will then be shared with the student.

For a "needs improvement" rating, the student will be provided with a list of milestones required to bring their progress to "satisfactory" and a timeline of no more than two weeks to achieve the specified objectives. After two weeks, another meeting will be scheduled for the student to update the reader and supervisor. After the second meeting, the reader and supervisor would reevaluate the student's progress. Cases where a student has not achieved a satisfactory evaluation by the second meeting should be brought to the chair of the Biology Department.

### **Oral Presentation and Defense (winter semester)**

Students will present a summary of their thesis research project. Students are given 12 minutes for their talk and approximately 10 minutes of questions from the Reader, the Supervisor, other members of the department and the public. Students are expected to prepare slides using PowerPoint or other application. The questions generally focus on what was presented in the talk but could include other aspects of the research. Students do not have to present every single result, but there should be distinct introduction, methods, results, and discussion/conclusion sections. It is appropriate to include citations on slides.

Any faculty members attending the Honours presentations are asked to grade the presentations using the attached grading scheme (see end of this document).

**Thesis defense date (TBA between April 11-22) is non-negotiable.** Extensions will not be given except in exceptional circumstances and these must be approved by the Departmental Chair.

### **Written Thesis (winter semester)**

The written document includes a title page, table of contents, acknowledgments, abstract (300 words maximum), introduction (including literature review), methods, results, discussion/conclusions, literature cited, and appendices (if suggested by the supervisor). The total length should be 80 pages or less (double spaced), including all tables, figures and appendices.

#### **Specific Guidelines**

Title page: follow guidelines in the format document attached below

Spelling: students may use either "American" or "British" spelling but should be consistent throughout.

Citation format: in-text citations should be provided and students must be careful to check to see that all in-text citations have a full citation in the literature cited at the end of the thesis. Students can use any of the commonly used citation formats in their field as long as they are consistent. Students should consult with their supervisor to determine the citation format before writing the body of the thesis.

#### **Figures and Tables.**

All figures and tables should have an informative caption. Any diagrams or figures reproduced from other sources must be accompanied by copyright approval from the copyright owner (see details in the format document below). Figures and tables can be placed at appropriate places in the text or at the end of the document (consult your supervisor about this).

#### **Appendices**

Information about the research that is too detailed or inappropriate for the main body of the thesis can be placed at in appendices at the end of the thesis.

**Due dates:** The defense version of the written thesis is due **April 1**; note that you should hand in a draft to your supervisor at least two weeks prior to this date so that they have time to evaluate and return to you with any required changes or additions in time to meet the **April 1** deadline.

After the defense version is submitted, both the Reader and Supervisor will read the thesis, make comments on the draft indicating required revisions for the final version, and will each submit a grading sheet to the chair of the department (see end of this document). The student must then make the required edits and have both the Reader and Supervisor sign off on the final version (signature page, see end of this document for a template). The final grade will then be submitted on Banner by the chair of the Department.

After completing revisions required by the Supervisor and Reader, the student must submit the thesis, in proper format (document follows) to the Library. The due date for submission to the Library is generally May 1.

For convenience, relevant forms are attached at the end of this document:

1. Honours Progress Update Form
2. Signature Page template
3. Honours Thesis Report Form (evaluation of written thesis)
4. Honours Thesis Defense Marking Scheme (evaluation of oral defense)
5. Update to the Thesis Submission Process During Virtual Operations

**BIOL 4500**  
**Honours Progress Update Form**

**Student Name** Click here to enter text.

**A#** Click here to enter text.

**Email** Click here to enter text.

**Tentative thesis title:**

Click here to enter text.

**Progress**

**October meeting**

**Specific Milestones**

- Experimental design complete
- Understands methods (to be) used
- Access to all necessary equipment, sites, resources
- Has begun to read relevant literature
- Has begun collecting data
- Presents reasonable timeline to completion

**Comments**

**Satisfactory**

**Needs Improvement**

**January meeting**

**Specific Milestones**

- Data collection complete
- Methods written
- Understands statistical analyses used
- Preliminary results written

**Comments**

**Satisfactory**

**Needs Improvement**

If "needs improvement" is chosen, provide a list of required tasks to be completed by the student and a deadline for each:

[Title]

by

[Student name]

A Thesis Submitted to  
Saint Mary's University, Halifax, Nova Scotia  
In Partial Fulfillment of the Requirements for  
the Degree of Bachelor of Science with Honours

April, [Year], Halifax, Nova Scotia

Copyright [Student name, year]

Approved: \_\_\_\_\_  
Dr. [supervisor's name]  
Supervisor

Approved: \_\_\_\_\_  
Dr. [reader's name]  
Examiner

Date Submitted: [date defense version was  
submitted]

## HONOURS THESIS REPORT FORM

STUDENT NAME: \_\_\_\_\_ SUPERVISOR/READER: \_\_\_\_\_

How do you rate the thesis on the following points (use letter grades)?

	Comments (quality and quantity of work involved)	Grade
<b>Introduction</b>		
<b>Methods</b>		
<b>Results</b>		
<b>Discussion</b>		
<b>Writing</b>		

Additional comments:

Please allocate an overall grade based on your assessment: \_\_\_\_\_

### Honours Thesis Defense Marking Scheme

Honours Thesis Student: \_\_\_\_\_

Name of Judge: \_\_\_\_\_

1	2	3	4	5
Poor	Fair	Satisfactory	Above Average	Excellent

	<u>Score (/5)</u>	<u>Final Score</u>
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**Content:**

**Introduction:** Adequate background, clear objectives \_\_\_\_\_ x 3 = \_\_\_\_\_

**Methods:** Thorough and clearly presented \_\_\_\_\_ x 2 = \_\_\_\_\_

**Results:** Clear, relevant to objectives and of quality \_\_\_\_\_ x 3 = \_\_\_\_\_

**Discussion:** Results interpreted and placed in context with literature \_\_\_\_\_ x 2 = \_\_\_\_\_

**Referenced statements:** Used references to back up statements \_\_\_\_\_ x 1 = \_\_\_\_\_

**Conclusions:** Tied in with objectives, main points summarized \_\_\_\_\_ x 1 = \_\_\_\_\_

**Literature Cited Summary:** Slide of references \_\_\_\_\_ x 1 = \_\_\_\_\_

**Technical:**

**Visual Appearance:** Clear font, simple uncluttered background \_\_\_\_\_ x 3 = \_\_\_\_\_

**Presentation:**

**Engaging speaker and good flow:** Evidence of practice \_\_\_\_\_ x 2 = \_\_\_\_\_

**Questions answered well:** Displays mastery of subject \_\_\_\_\_ x 2 = \_\_\_\_\_

Grand Total \_\_\_\_\_

**Comments:**

## **Update to the Thesis Submission Process During Virtual Operations**

While the campus is closed, the theses submission and publishing process will continue. Please read the instructions below carefully for important modifications to the process, alongside the standard Theses or Dissertation **Format Procedures** forms, found here: <https://smu.ca/academics/archives/thesis-forms-procedures>.

*Please note: consult with your advisor, Graduate Studies, the Service Centre, and others for additional information about the theses process.*

### **For Honours Theses, Masters Theses, PhD Dissertations, and Major Research Projects**

1. Do not print off and submit the Thesis/Dissertation Information Sheet. Instead, please include the required information in your covering email. The information you **must** include in the email is indicated on the next page.
2. For the additional paperwork, including **REB forms, copyright letters, License to Reproduce forms, requests for restrictions**, or any other forms/paperwork:
  - a. If you have them in electronic format, or have access to a scanner, please submit them as attachments when you send us your theses. Restriction requests must be attached as an electronic document when you submit.
  - b. If you do not have them in electronic form and/or do not have access to a scanner, please hold on to the print copies for now. You will be contacted at a later date regarding submission once physical operations resume.

### **For Masters Theses and PhD Dissertations Only**

3. No print copies of theses are to be submitted, only electronic copies using the instructions on the **Format Procedures** sheets linked to above.
4. **Signature sheets or Certification pages:** committee members can scan/email the form separately; they can also print/sign/take a photo, or if that's not an option they can submit an email stating they approve of the thesis. Contact Graduate Studies for more details.

If you are submitting an undergraduate thesis or Major Research Project, contact the University Archives at [theses@smu.ca](mailto:theses@smu.ca) if you have any questions.

If you are submitting a graduate thesis, contact Graduate Studies at [shane.costantino@smu.ca](mailto:shane.costantino@smu.ca) if you have questions any time up to the point you submit, or [theses@smu.ca](mailto:theses@smu.ca) for questions after this point.

**Your covering email (when you submit the pdf thesis/dissertation) must include the information and text on the following page. It will be rejected if any of this is missing.**

**Covering email must include:**

Name of student (as it appears on the title page):

Student's A#:

Title of Thesis/Dissertation (as it appears on the title page):

Degree awarded (BA, BSc, MA, MSc, PhD, etc.):

Department:

Faculty Advisor:

Research Ethics Board Number (if one was assigned):

**I grant Saint Mary's University the non-exclusive license to publish my theses, and to make it available to the National Library of Canada theses program.**

Attached forms and paperwork (if required/applicable):

	Attached	Will submit later	Not applicable
Signed Signature Sheet/Certification Page			
Research Ethics Board Certificate			
Copyright letter(s)			
Request for Restriction			
License to Reproduce form			
Other:			
Other:			