

# BIOLOGY 4F06 Senior Project Regulations

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## 1. Preamble

The Department of Biology at McMaster University provides a research-intensive environment that offers a unique opportunity for students in all *Honours Biology and combined programs* to both participate in and contribute to the research of the faculty. Students participate in research while earning credits towards their degree through the 6-unit Senior Project (Biology 4F06) course. This is a two-term inquiry course that provides students an opportunity to conduct original research under the supervision of a Full-time or Associate Member of the department. Upon successful completion of this course, students should have demonstrated general proficiency in carrying out independent research in a variety of ways that do not necessarily require the student to design experiments and to test hypotheses. Students can learn specific laboratory skills and apply these in their projects to solve a very specific methodological problem, or conduct an in-depth literature review to construct conceptual ecological models, or undertake a field survey to describe the ecology of an ecosystem. Since the nature of these projects vary, it is difficult to give a generic description. In addition, project students are further challenged to present and defend their findings by giving a platform presentation at the end-of-term **Biology Undergraduate Symposium (BUS)**, to which supervisors, all faculty in the department and the general public are invited.

## 2. Eligibility of Students

- a. This project course is open **ONLY** to students registered in **Level IV of Honours Biology and combined programs**. It does not include students in other programs. This course is strongly recommended for students contemplating graduate work in Biology, or who are interested in pursuing a career in research of any kind.
- b. Students in Honours Biology or combined programs who wish to carry out a laboratory or field experiment that involves the testing of hypotheses should consider registering in **Biology 4C12**.
- c. This course takes place over two terms, usually during the Fall and Winter terms. The time commitment a student needs to allocate to this course will vary with the project, supervisor and student. As a general rule of thumb, students should expect to spend a minimum of 10-12 hours per week, with more time allocated to research early in the first term. When interviewing prospective supervisors, students must clarify expectations in regards to the amount of lab time supervisors expect the students to devote to their projects, as this component is highly variable. Ideally, the analytical or experimental phase of the project should be completed by the end of February so that the remaining time in March can be devoted to data analysis, writing and editing. All laboratory work should cease by mid-March to allow for two to three weeks for completion and submission of the thesis.
- d. It is important for both supervisors and students to agree on the topic of the research. The grade attained in Biology 4F06 does not necessarily require the completion of the experimental, analytical or model development as outlined when beginning the project. Circumstances beyond a student's control - unavailability or late arrival of reagents, contamination of biological materials, instrument failure, absence of target organism in field samples - could frustrate well-planned and well-executed projects. In such cases, allowances will be made and students may still attain first class grades on the basis of their overall understanding, effort and creativity in coping with their experimental problem.
- e. In addition, it is important to discuss with the supervisor and clarify the expectations for each component of the

course i.e. lab work (if applicable) and written components (research proposal, mid-year report, thesis) and presentation at the Biology Undergraduate Symposium. In order to meet these expectations, enough time must therefore be devoted to the preparation of these assignments. In case of a disagreement between the supervisor and student, the course Coordinator will help in clarifying the rules on realistic expectations for the 4F06 course.

### 3. Course Components and Grading Scheme

Students in the course are evaluated on the basis of five components:

Component	Weighting
Research proposal/literature review	10%
Mid-year report	15%
Written thesis	25%
Work performed to collect and analyze data (e.g. activities performed in the laboratory or in the field or using or generating data on computers)	25%
Platform presentation during the Biology Undergraduate Symposium	25%

All components of the senior project are graded solely by the supervisor. The proposal and/or literature review is due usually mid-way during the first term. Please note, that students must also submit page 1 of the Research Proposal form electronically to the course Administrator for review by the course Coordinator (this page should also be included in the copy submitted to the Supervisor and Co-Supervisor). Page 1 is a summary of the Hypothesis, Objectives and Progress of the ongoing project/review. Grade forms will be available on Avenue.

The written mid-year progress report is due early in the second term. These components are intended to provide solid feedback to the students early in the project. All laboratory experimentation or data analyses must be completed by the end of the second term, at which time the supervisor will assess the student's work during the two terms with respect to activities performed in the lab or in the field, data analysis and computation. The first draft of the project report is expected to be submitted to the supervisor before the end of the second term. The supervisor MUST also attend the talk or poster session during BUS to ask questions of the student, and to grade the student on this component. After the supervisor provides comments on the first draft of the report, the student must make the corrections and submit the final project report in a pdf format to the Course Administrator. If permission is granted by the supervisor, the document will be posted on the web or else archived in electronic format by the department.

It is **important to meet all deadlines** as some components and, particularly, the presentation at the Biology Undergraduate Symposium, involve complex logistics in the organization of the event. **No extension will be granted.** A penalty of 5% per day will be assessed for all students who do not submit their assignment by the due date.

### 4. Project Selection

Students who wish to enroll in this course must seek the support of a supervisor, who is a Full-time or Associate Member of the department. You may choose a supervisor from another department but then you MUST have a co-supervisor who must be a full time faculty member of the Biology department. The first step is to consult the list of potential supervisors or the Faculty list available on the Biology website. Students should first select prospective supervisors to contact based on their general area of research interest. We recommend that students first contact the professor by email and then make an appointment to discuss potential projects and the general nature of the professor's research program. During this meeting, students should ask for clarification of the professor's expectations with respect to number of hours per week in the laboratory, and whether or not weekend and evening work is required or expected. It is also a good idea to talk to a prospective supervisor's current project students in advance of the meeting to gain some insight into his/her supervisory style. The permission form for the course is available from the biology website and this must be downloaded, completed, and signed by the supervisor and returned to Course Administrator, LS-119, no later than **April 30**. Students WILL NOT be granted permission to

register into the course without the permission of the supervisor (and co-supervisor where necessary).

<http://www.biology.mcmaster.ca/undergraduate/permission-forms/>

If, after the start of the project, the student has the support of the supervisor to switch to the Biology 4C12 Thesis, a memorandum detailing the reasons for the request must be signed by the student, and both the supervisor and a co supervisor\* and submitted to the Course Coordinator for approval. Deadline for such requests will be **November 30 of the current academic year**. On a case-by-case basis, the Course Coordinator may approve a transfer at a later date.

\* Please review the course requirements of the Senior thesis, 4C12, found separately.

## 5. Roles and Responsibilities

### The Supervisory Committee

If the prospective supervisor is a researcher or professor in another department, who does not have supervisory privileges in the department of Biology, then the student must find a suitable **co-supervisor**, who is either a Full-time professor of the department of Biology or an Associate Member of the department with supervisory privileges. Together, the supervisor and co-supervisor form the **supervisory committee**, which is responsible for grading the students' BUS presentation and final project report. If the supervisor is a Full-time or Associate Member with supervisory privileges, then the supervisor is solely responsible for marking all components of the project. The list of potential supervisors will be updated annually, please see the Course Administrator for this list. **Regardless of the supervisor's status, professors who are absent from the University for more than two weeks during either term will not be permitted to supervise or co-supervise students, unless alternate arrangements have been made to have a colleague, graduate student or post-doc to substitute during their absence and the contact information of that person must be forwarded to the course administrator.** When appropriate, additional committee members outside of the department may be permitted to sit on the student's supervisory committee and requests of this nature will be subject to the final approval of the Course Coordinator.

### Responsibilities of the Supervisor

Supervisors are responsible for the immediate direction and instruction of the student and should commit on average, a minimum of 30 minutes of contact time each week with the student. Supervisors will communicate their own expectations in terms of the day-to-day conduct of the student in the laboratory/clinic/field, as well as protocols used to track research progress and collect data (i.e. use of lab note books, etc.). Since it is impractical to insist on a single format for all disciplines and project types, as supervisor, you are responsible for setting guidelines and terms of reference for the research proposal or literature review for your own students. The supervisor should provide regular oral or written feedback to the student in regards to level of productivity, and degree of satisfaction of the student's progress. **Students should be clear on what is expected of them throughout the course.** Supervisors are also responsible for the safety of the students in the lab, and to ensure that all necessary equipment have been made available and appropriate safety courses have been taken by the student before commencement of laboratory or field work. This includes taking **WHMIS 2015 training**, and completing all lab specific safety training. The student is responsible for bringing written confirmation of training dates and location of training to Biology Main Office, LS-218 during the first full week of the school term in September. The confirmation must be signed by the student and the supervisor. All computations, and laboratory or field work should cease by mid-March, to give sufficient time for students to complete the analysis, writing and editing of the first draft.

Clarifying the expectations for the Biology Undergraduate Symposium (BUS): No event is more stressful for students than the presentation at the Biology Undergraduate Symposium. **Supervisors must clarify the expectations for this presentation.** The Supervisor must emphasize proofreading and the importance of preparing a talk well ahead of the deadline. The Supervisor must also indicate to the student if he/she needs to preview/approve the presentation well ahead of the deadline for submission of the electronic file of the

presentation. Again, this is necessary to ensure the efficient and timely organization of the Symposium.

### Responsibilities of the Student

It is the responsibility of the student to keep the supervisor (or supervisory committee) up-to-date throughout the year regarding progress on the project and any change in the project topic or proposal. We recommend that the **student organize a meeting with the supervisor (or supervisory committee)** before handing in their Research Proposal/Literature review to discuss the nature and scope of their project. During this meeting, the student should also request written guidelines and marking schemes for the research proposal/literature review, mid-year report, final thesis and the lab component of their grade. If appropriate, the student may request to see copies of final project reports completed by former project students. The grade sheet for both the Proposal/Literature Review and Mid-year Progress report must be signed by the student; this ensures that the student obtains appropriate feedback and is aware of the grade attained for each component. If the supervisor does not notify the student of his/her grade within one week of the due date for return of the grade sheet (see List of Important Dates), the student should inform the Course Administrator. A student can direct any issue of a scientific nature to the supervisor (or supervisory committee) at any time; however, if conflicts arise that cannot be solved between the student and supervisor (or supervisory committee); it is the **responsibility and right** of the student to ask the Course Coordinator to intervene. Students must also discuss the expectations for each component of the course (lab work, written components and presentation at the Biology Undergraduate Symposium) with the supervisor.

### Responsibilities of the Coordinator

There will be lectures/meetings scheduled throughout the two terms, during which all students in the course can meet with the Course Coordinator and Administrator to discuss various issues relating to deadlines, course requirements, etc and to get guidance on time-management and how to communicate effectively with your supervisory committee. The Course Coordinator can also provide individual counseling if problems cannot be solved between student and supervisor.

### Ontario Biology Day Conference

This event is held annually in March at an Ontario university. Students are encouraged to make a platform presentation in this conference, as a dry-run for their BUS presentation. This conference also provides an excellent opportunity to meet fourth year Honours students and faculty from other universities throughout the province and to assess potential laboratories for graduate work.

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