SC/BIOL 4000 8.0/3.0 - BIOLOGY HONOURS THESIS
INFORMATION PACKAGE - Fall/Winter 2008-2009

Course Directors:

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The objective of these courses is to give students research experience in the Biological Sciences, and the opportunity to enhance their critical analytical and communication skills. The courses are open to eligible Honours Biology students in their final year. Eligibility must be determined by the Biology Undergraduate Director, who will indicate such by signing the attached form.

TYPES OF HONOURS THESIS COURSES:
The 3.0 credit course is an in depth literature review or research proposal, which demonstrates the student’s knowledge and understanding of a topic. The best thesis will thoroughly review the literature in a particular field or area of interest, identify gaps or inconsistencies, and generally develop a specific hypothesis, argument or model. The thesis should then demonstrate that the student can select and organize the appropriate literature to support the proposed hypothesis, argument or model and perhaps even propose an experimental design to test the hypothesis (with clearly laid out predicted outcomes and possible pitfalls). The 8.0 credit thesis involves a significant investment of time and energy in a research project (which can be lab- or field-based) and the written thesis will clearly describe the background relevant to the research project, the question or questions being asked in the research (perhaps with specific aims or objectives), the methodology used, the results obtained and their interpretation (comparing and contrasting the students findings) within the context of the research project and the general field. The 8.0 credit thesis should demonstrate the student’s ability to interpret data from an original research project in which the student has used some combination of experimentation and/or observation to investigate a biological question.

The nature of the topic for both courses reflects the interests of the student and a faculty member of the Biology Department and is selected by mutual agreement. Students should be highly interactive and motivated and seek assistance from their supervisor as to the topic of their thesis research as soon as possible. Students are reminded that this is a Biology Honours thesis and that the topics must be central to modern biology. Supervisors are typically faculty members with the Department of Biology. Occasionally (and ONLY with the permission of the Course Director) a supervisor can be a faculty member from another department IF that individual is a member of the Graduate Program in Biology.

MEETINGS
There are no formal lectures scheduled for either course, but there is an information session, which all students enrolled in any term during 2008-2009 year are strongly advised to attend. There may be a mid-term meeting for students enrolled in a given term, to address any questions or concerns that may have arisen. We hope to offer our regular “How to Have a Happy Defence” session before the standard defence period which will take place during the regular exam period.

PROCEDURE TO ENROL

1. Go to the UG office (108 FS) and obtain an information package with enrolment form.
2. Find a supervisor and fill out the form (advisor, thesis topic, etc) in consultation with the supervisor.
3. Bring form to UG office to be signed by an UG advisor.
4. Bring the signed form to Mrs. Audrey Johnson in room 247 FS, who will then mount a permission to allow you to enroll in the course.
SUPERVISION AND EXAMINATION

Students' work and performance in this course are directed and evaluated by the student’s research supervisor, an advisor, and the course director. The supervisor will be the primary contact for the student in regard to their thesis work. Honours students should work closely with their supervisor in order to produce the best quality of work. Some of the best honours theses come from students who become junior lab members, working closely with, for instance, graduate students within the lab and/or meeting regularly with their supervisor and discussing their thesis research. The role of the advisor is primarily to evaluate the written thesis and presentation at the end of the students program but they are also usually individuals with a general expertise in the area of the student’s thesis topic and they should be available to provide input and advice to the student if necessary (and only on a limited basis). The course director oversees the entire honours research thesis program within the department and ensures that standards are maintained across the department and that evaluations are equitable for all students. If a student has concerns about their thesis that cannot be addressed by their supervisor, they should contact the course director.

The research supervisor and advisor are normally faculty members in the Department of Biology who have agreed to direct, oversee and evaluate the student's work. The selection of advisor is based on the same criteria as supervisor (must be a faculty member with the Department of Biology or a member of the Graduate Program in Biology). Permission for supervisors or advisors from outside of York University will be denied without exception.

Most students use a combination of their experience of SC/BIOL 3100 2.0 and other courses they have taken, as well as listings of Faculty interests on the departmental web site, to identify an appropriate supervisor. Please note - many faculty are now receiving interest in honours placements several semesters in advance and it is advisable to start looking for a supervisor as soon as possible. It is the students’ responsibility to ensure that they are eligible for BIOL 4000. It is expected that the student will spend about 10-12 hours per week (possibly considerably more depending on the nature of the research) in the lab for two terms for the 8 credit course. The 3.0 credit thesis is not a “watered-down” version of the 8.0 credit thesis and will likely require an equivalent amount of time in order to obtain to meet the expected standard. Both forms of honours thesis require evidence of a students ability to read the literature critically and with understanding and should also show evidence of the ability to write clearly and concisely, with correct and appropriate grammar, spelling and referencing of materials. Note that the 3.0 credit thesis not a glorified essay and should be more than a literature review that would form part of another course - it must show evidence of critical thinking skills and an understanding of the scientific method.

All honours students must write up his/her studies in the form of a thesis. See the format below.

The 3 credit course must be completed in one term. The 8 credit course requires enrollment over two consecutive terms. The course may be started in any one of the Fall, Winter and Summer terms.

The final mark for the course will be determined on the basis of the written thesis (60%) and an oral examination which is more commonly referred to as the “defence” (40%). This examination is conducted by the Course Director, the Supervisor and the Adviser and will consist of a 10-15 minute presentation by the student outlining the main points and findings of their thesis research, followed by ~45 minutes of questions by the examining committee, to determine the student's understanding and knowledge of the research topic. Both the Supervisor and Adviser should be present at the oral examination; however, in the unusual case where an Adviser cannot be present, the Supervisor will arrange for another suitably qualified faculty member to be present.

The marks for the course will be apportioned as follows: 60% of the grade will be given for the written report and 40% for the presentation and defence of the work during the question period. The Course Director generally gives a one-time “How to have a Happy Defence” session for all honours students in the weeks
leading up defences. This is not mandatory but some students find it useful for providing advice and suggestions in advance of their defence.

Each oral examination (defence) will be ONLY held during the prescribed examination period (December, April or August) and the date and time for each individual oral exam will be determined by mutual agreement between the individual student and the examining committee, so that no student is disadvantaged through conflicts with other final examinations. As soon as students know their exam schedule, they should meet with their supervisor and advisor and find 3 (THREE) separate one-hour time slots that are mutually agreeable to all (student, supervisor and advisor). Then, **and only then**, please see Mrs. Audrey Johnson, in Rm 247 to make the final arrangement for the oral examination. Mrs. Johnson will then schedule the final times, dates and places for all oral examinations based on the schedule of the course director. **Not every student will be able to defend on the last day of exams although typically, everyone wants that date.**

**IMPORTANT:** The final version of the thesis MUST be handed in to the supervisor, advisor and course director on Dec. 1, 2008 (for students defending in the fall term) and April 6, 2009 (for those defending in the winter term). The SU deadline will be determined when the summer 2009 academic schedule is known.

A thesis that is handed in late will be penalized at a rate of 5% per day (on the final total grade). There will be NO exception except for very serious situations such as medical emergencies, chronic and serious health issues and certain types of research disasters (all the animals died etc.) just as is the case for all other courses in Biology.

ANY requests for deferred status, i.e for defences outside of the regular exam period, etc. MUST be made to the **COURSE DIRECTOR**. The supervisor or advisor CANNOT approve a delayed defence without the permission of the course director. Any request for a deferred status must be made with as much advance time as possible and must be due to a reason as outlined above.
THESIS OUTLINE

There are no specific guidelines concerning the length of a thesis, but students are reminded that an accurate and concise thesis usually indicates a better understanding of the topic. While there is no specific length, most honours theses range between 20 – 40 pages, double-spaced, excluding references, figures etc. The organization of the research thesis typically follows that of a scientific research paper, as outlined below. The organization of the 3.0 credit thesis can follow a number of styles including as outlined below and some of the most successful recent 3.0 credit theses have been in the format of a research proposal.

USE THESE PROPOSED OUTLINES AS GUIDES – DISCUSS WITH YOUR SUPERVISOR

8.0 Research Thesis

Title Page
Abstract
Introduction
Materials & Methods
Results
Discussion
Conclusions
Acknowledgements
References

3.0 Review Thesis

Title Page
Abstract
Introduction
Review of Literature
Synthesis and Summary
[Proposed Research]
Acknowledgements
References

The Abstract should be brief and to the point, no more than half a page.

The Introduction should clearly identify the purpose of the work, especially focusing on the biological problems and questions being addressed. The other sections of the thesis should have appropriate sub-headings to make the story readable and easy to follow. There is a trend in modern papers for these headings to be in the form of very short (e.g. 2-5 words) statements giving the main point of the section, a trend you may wish to follow.

The Conclusions should refer back to the Introduction, showing how the completed work relates to the original objectives.

The References section should be accurate and in the style of one of the leading journals in the field. (It is recommended that you discuss reference format with your supervisor.) Incorporation of work from recent references should be considered mandatory for both types of thesis, unless the topic is primarily historical in its focus. References should, typically, only ever be to primary, peer-reviewed literature. Textbooks, websites such as Wikipedia, etc. are ALMOST ALWAYS unacceptable as appropriate references for an honours thesis. Correct referencing of sources is one of the easiest things to get right – do not let sloppiness here cost you marks. There are several software packages that are available to help with referencing such as Refworks or Endnote.

In case of review theses, remember that excessive use of one or more review papers as the primary source for the thesis is unlikely to be well rewarded.
THE UGLY WORLD OF ACADEMIC DISHONESTY AND PLAGIARISM
All students, regardless of the course they are enrolled in, should be familiar with all institutional (FSE, Senate) guidelines and information relating to academic honesty.

Senate Policy:

ALL STUDENTS ARE REMINDED THAT IT IS THEIR RESPONSIBILITY TO KNOW WHAT CONSTITUTES PLAGIARISM AND TO ENSURE THAT THE WORK THEY SUBMIT IS THEIR OWN. WE HAVE A ZERO TOLERANCE FOR PLAGIARISM AND WE PROSECUTE CASES VIGOROUSLY

NOTE – STUDENTS MAY BE REQUIRED TO SUBMIT THEIR THESIS TO TURNITIN (some supervisors require this) OR TO MAKE AVAILABLE ALL THEIR ORIGINAL NOTES AND EARLY DRAFTS OF THEIR THESIS. WE STRONGLY ADVISE YOU TO USE TURNITIN FOR YOUR OWN BENEFIT TO HELP IMPROVE YOUR OWN WRITING

Since this course emulates real science, we now require a signed statement (attached to the back of this information package) which is to be included with each submitted thesis.

THE GENTLER WORLD OF YOUR COURSE DIRECTOR AND HER SAGE ADVICE
First, and most importantly, students should start work on their thesis as soon as possible after enrolling and should take the opportunity to obtain feedback on their written work from their supervisor or advisor wherever possible. The honours course is a rare and wonderful course because you have ample opportunity to improve your grade by handing in draft versions of your thesis well ahead of the final deadline. You can obtain feedback, then revise, reword, correct and resubmit. This will almost always result in an improved thesis and a better grade. Ultimately, we want this to be a positive experience and for you to learn how real science works. It can be frustrating, challenging and difficult but ultimately, tremendously rewarding. If you have any questions or concerns, see your supervisor or myself. We want you to achieve your full potential and do your best in this important course.

DO NOT LEAVE EVERYTHING UNTIL THE LAST MINUTE!!
Ethics in Honours Thesis
(taken, in part, from the requirements for authors submitting manuscripts to the journal, FEBS Letters).

The Course Directors for SC/BIOL 4000 8.0/3.0 believe that there are fundamental principles underlying scholarly work produced for this course. The Honours Thesis should:

- be the authors own original work
- reflect the authors own research and analysis and do so in a truthful and complete manner
- properly credit the meaningful contributions of co-authors and co-researchers
- be appropriately placed in the context of prior and existing research

The Course Directors believe it is useful to outline the expectations of honours thesis authors.

* Relevant prior and existing research and methodologies will be properly identified and referenced using standard bibliographic and scientific conventions.
* All reporting, writing and editing that make up the content of the submitted paper shall be the original work of the authors and shall not plagiarize the work of others.
  o Plagiarism can mean the literal copying of the entirety of another’s article or paper or other text.
  o Plagiarism can also mean the literal copying of large portions of another’s work or even the substantive “paraphrasing” of another’s work (e.g. using the same set of sentences from a published text in your work, but changing the order in your text or copying paragraphs from other papers but changing some of the nouns, adjective or verbs to those of your choice while the basic format and content of the paragraph remains the same as the original, etc.)
* Short quotes from the work of others may occasionally be used in the preparation of scholarly or professional manuscripts, but all such quotes should be properly referenced with full bibliographic details of the quoted work, as it is important to place the reported research or conclusions in a scholarly context.
* Note that to quote or copy text or illustrations beyond a “short quote” will require the author to obtain permission from the rights holder.
* Co-authors and co-contributors should be properly and appropriately identified
* All participants in a research project that is the subject of a paper who made a substantive contribution to the research and the analysis presented in the paper should be identified or credited.
* Other participants with less responsibility - for example, those who merely assisted in carrying out the research - should be identified and acknowledged for their contributions.
* Research and testing methodologies should be consistent with guidelines of research institutions, relevant societies, or funding agencies, especially those that may involve the treatment, consent, or privacy of research or testing subjects.

All students are required to sign a copy of this page stating that they have read and understood these expectations and submit the signed copy along with their final version of their thesis.

Student Name

Student #

Date

Course Director Signature

Date

This form will be kept on file by the Course Director.
SC/BIOL 4000 HONOURS THESIS REGISTRATION FORM

Name ___________________ Student # ___________________

Email ___________________ Phone ___________________

Term ___________________ Expected Completion Date ___________________

Supervisor ___________________ Advisor* ___________________

Title and outline of project:

Supervisor’s Signature ___________________ Advisor’s Signature ___________________

Student’s Signature ___________________ Date ___________________

*While student and supervisor will identify an advisor, who must agree to act as such, final approval remains the prerogative of the course director.

When the above portion has been completed, bring form to the UG office (108 FS) to be approved by an UG advisor.

Approval of UG advisor ___________________ Date ___________________

When form is signed by UG advisor, bring it to Mrs. Audrey Johnson, 247 FS, who will then mount permission for you to enroll in the course. Mrs. Johnson and the Course Director administer all subsequent aspects of the course. Please direct any questions to them.