PREFACE

A message from the Department Chair

Dear Graduate Students,

Welcome to the Department of Biology! We are pleased that you have chosen Western as your place for graduate studies, and hope that you will find the Department, University and City of London welcoming places. From our perspective, graduate students maintain the vigour of creative scientific endeavour in departments like ours that have a strong research orientation. One of our primary goals is to provide an environment that will stimulate enquiring minds and foster the excitement and joy of scientific discovery.

We are justifiably proud of our graduate students. They have established an enviable tradition of excellence, and I am pleased to acknowledge their continuing contributions to the research and teaching efforts of this department. On behalf of the faculty and staff in the Department of Biology, I extend a warm welcome to all our new graduate students. You can be assured of our encouragement and support as you pursue your studies here at Western.

Welcome to the Gang.

Mark Bernards
Chair, Department of Biology
A message from the Society of Biology Graduate Students (SOBGS)

Dear Fellow Graduate Students,

On behalf of the Society of Biology Graduate Students (SOBGS), it is my pleasure to welcome all new and continuing students to a new academic year in the Department of Biology. Our Department is a premier destination for post-graduate biology education, dedicated to research and academic excellence.

By joining this department, you have become a part of a dynamic research environment that fosters leading edge and collaborative research. The Department of Biology is a friendly environment that offers the use of state-of-the-art-research facilities and support from highly respected researchers.

This handbook outlines all the pertinent information needed as a graduate student in this department. Please take the time to acquaint yourself with your responsibilities and program requirements.

If you wish to get involved with graduate issues, I encourage you to participate in committees such as SOBGS, the Society of Graduate Students, and/or the teaching assistant union, PSAC local 610. These committees allow you to take an active role in matters relevant to graduate students in Biology or at Western.

I wish you success during your time here. If you have any questions, concerns or suggestions please feel free to contact me. I look forward to serving as your Chairperson this academic year and furthering the interests of the graduate students in this department.

Joe Stinziano
SOBGS Chairperson, 2014-2015
A message from the Associate Chair (Graduate Education)

Dear Graduate Students,

On behalf of the Biology Graduate Education Committee, I am delighted to welcome you to the Department of Biology at Western. We strive to provide a rigorous, supportive, and collegial intellectual environment, and to promote and celebrate the success of our students.

Graduate students in Biology take advanced coursework to deepen their knowledge of specific areas in Biology and related disciplines; expand their repertoires of scientific techniques and skills; teach undergraduates to develop their skills as educators; and work closely alongside internationally recognized faculty members. Most importantly, our students design, conduct and publish cutting-edge research, tackling important questions in biology from levels of organization ranging from molecular and cellular through community and ecosystem approaches. In particular, I encourage you to contribute to your own broad intellectual development by attending seminars and meeting with seminar speakers when the opportunities arise.

Although this is an academic environment, bear in mind that the majority of you will end up working outside academia. I therefore encourage you to avail yourself of the various career development opportunities that will be placed before you in your time as a Biology grad student.

We in Biology are very proud of the successes of our graduate students. They work hard, they work wisely, and they make a difference in the world. I wish you every success during your time in our program.

Brent Sinclair
Associate Chair (Graduate Education)
The Biology Graduate Program: A Brief History & Overview

The Department of Biology was formed July 01, 2003 through the merger of the former Departments of Plant Sciences and Zoology, and the Biology Graduate Program was officially launched in the fall of 2003. Prior to the merger, the Departments of Plant Sciences and Zoology collectively had a total of 86 graduate students. The formation of the Department of Biology and subsequent merger of two graduate programs has resulted in the re-invigoration of graduate studies in Biology at Western as well as unprecedented growth. Indeed, since 2003 our graduate student population has grown to its present level of about 150, making the Biology Graduate Program the largest in the Faculty of Science. And, with continued growth in the department as a whole, there is likely to be even greater growth in graduate student numbers in the years to come.

Given that the Graduate Program in Biology was derived from a merger of two existing programs, it contains elements of both, as well as unique components. Due to its size, the program is divided into three general areas or streams that reflect the basic areas of research emphasis within the Department of Biology: Cell & Molecular Biology; Ecology & Evolution; and Physiology & Biochemistry. Students are required to identify with one of these streams, primarily as an administrative convenience for the program, but also as a way to provide smaller, more intimate groupings between graduate students. Each stream, for example, conducts its own student seminar series, and some streams have required courses for students enrolled in them.

Both M.Sc. and Ph.D. programs are thesis-based and successful completion of either program requires the writing and defending of an acceptable thesis. Additional program requirements include the writing and defense of a research proposal; presentation of and attendance at stream-specific graduate research seminars, the completion of either two (M.Sc.) or four (Ph.D.) half courses at the graduate level and successful completion of a comprehensive exam (Ph.D. Program only).
The Department of Biology Graduate Handbook

PART 1: BIOLOGY GRADUATE PROGRAM GUIDELINES AND REGULATIONS

CONTENTS

A DIGEST OF IMPORTANT INFORMATION & DATES AFFECTING GRADUATE STUDENTS .................................................................................................................................................................. 1

PART 1: BIOLOGY GRADUATE PROGRAM GUIDELINES AND REGULATIONS .................................................................3

1. EXPECTATIONS & RESPONSIBILITIES ......................................................................................................... 3
   A. Graduate Students ........................................................................................................................................... 3
   B. Supervisors ...................................................................................................................................................... 4
   C. Co-Supervisors ................................................................................................................................................ 5

2. DEPARTMENT OF BIOLOGY GRADUATE PROGRAM REGULATIONS ......................................................................... 7
   A. The Advisory Committee ................................................................................................................................ 7
   B. Satisfying Progression Requirements ............................................................................................................ 10
   C. Course Requirements ...................................................................................................................................... 10
   D. Change of Status from the M.Sc. to the Ph.D. Program ................................................................................ 11
   E. Continuous Registration & Maximum Registration Period ........................................................................... 11
   F. Financial Responsibilities of the Department and the Supervisor .................................................................. 11
   G. Extensions to Degree Completion Time ........................................................................................................ 11
   H. Appeals .......................................................................................................................................................... 12

3. BIOLOGY 9100/9150: GRADUATE RESEARCH IN BIOLOGY .................................................................................... 14

4. THESIS PROPOSAL ASSESSMENTS ............................................................................................................. 16
   A. M.Sc. Thesis Proposal Format and Guidelines ............................................................................................. 16
   B. Ph.D. Thesis Proposal Format and Guidelines .............................................................................................. 17
   C. Organizing the Assessment Examination ...................................................................................................... 18
   D. Submitting the Thesis Proposal ....................................................................................................................... 18
   E. Proposal Assessment Examination Procedure ............................................................................................... 19
   F. Proposal Assessment Outcomes and Consequences (M.Sc. and Ph.D.) ....................................................... 20
   G. Proposal Assessment Outcomes and Consequences (M.Sc. to Ph.D. Transfer) ........................................... 21

5. THE COMPREHENSIVE EXAMINATION PROCEDURE ..................................................................................... 22
   A. Organizing the Comprehensive Examination ................................................................................................ 22
   B. The Comprehensive Examination Itself ........................................................................................................ 23

6. THESIS ............................................................................................................................................................... 25
   A. M.Sc. Thesis in Biology .................................................................................................................................. 25
   B. Ph.D. Thesis in Biology .................................................................................................................................. 28

7. COLLABORATIVE PROGRAMS .................................................................................................................... 30
   A. Environment & Sustainability (Thesis-Based) ............................................................................................... 30
   B. Developmental Biology ................................................................................................................................... 31

1Note: Part 2: Graduate Students & the Department of Biology is available as a separate document on the Department of Biology website and contains important information about the Department of Biology and services available to graduate students.
A DIGEST OF IMPORTANT INFORMATION & DATES AFFECTING GRADUATE STUDENTS

1) September 30 is the last date for Fall term registration without penalty. January 31 is the last date for Winter term registration without penalty. May 31 is the last date for Summer term registration without penalty.

2) September 15 is the last date for enrolling in full courses or Fall term half courses. January 15 is the last date for enrolling in Winter term half-courses.

3) Within six weeks of the beginning of the first term of enrollment an Advisory Committee must be chosen and must meet to discuss course requirements. (The composition of the Advisory Committee can be changed later.) There must be at least one Advisory Committee meeting each year to complete and sign the appropriate progress report form, which must be returned to the Graduate Program Coordinator. Usually a meeting is held in the January-April period, especially if an assessment or other milestone is approaching, but a student can request an Advisory Committee meeting at any time and for any reason. All meetings of Advisory Committees must be recorded and in the student's file in the Graduate Program Coordinator’s office.

4) New graduate students should introduce themselves to the department office staff; to the Graduate Program Coordinator, Carol Curtis and assistant Arzie Chant; and to the Biology Graduate Education Committee Chair, Dr. Brent Sinclair. The chairperson of the Society of Biology Graduate Students (SOBGS) for 2014-2015 is Joe Stinziano, and the graduate student representatives to the Graduate Education Committee are Maja Milojevic and Jantina Toxopeus. Students are welcome to discuss any problems they might be having in the Department with these individuals or any other member of the Biology Graduate Education Committee.

5) Summary of Important Dates

<table>
<thead>
<tr>
<th>Program</th>
<th>Assessment</th>
<th>Comprehensive</th>
<th>Thesis Defense</th>
<th>Relevant Handbook Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.Sc.</td>
<td>Within 2 terms of admission to M.Sc. program</td>
<td>N/A</td>
<td>Within 6 terms of admission to M.Sc. program</td>
<td>4, 6</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>Within 4 terms of admission to Ph.D. program</td>
<td>Within 6 terms plus 1 month of admission to Ph.D. program</td>
<td>Within 12 terms of admission to Ph.D. program</td>
<td>4, 5, 6</td>
</tr>
<tr>
<td>Domestic M.Sc. transferring to Ph.D.</td>
<td>Within 5 terms less 1 month of admission to M.Sc. program</td>
<td>Within 4 terms plus 1 month of transfer to Ph.D. program</td>
<td>Within 15 terms of initial admission to M.Sc. program</td>
<td>2.D, 4, 5, 6</td>
</tr>
</tbody>
</table>

2As of September 8, 2015, BGEC members are: Brent Sinclair (Chair), Susanne Kohalmi (Vice-Chair), Danielle Way, Ben Rubin, Jeremy McNeil, Rima Menassa (Agriculture Canada), Maja Milojevic (Student Representative), Jantina Toxopeus (Student Representative), Greg Kelly, and Carol Curtis (Graduate Program Coordinator).
6) Students and supervisors should familiarize themselves with the graduate portion of the Biology website, including the availability of forms in PDF format that demarcate a student’s progress through the Biology Graduate Program. It is the student’s responsibility to bring the appropriate forms to committee meetings, assessment and comprehensive exams, and the thesis defense. Timely completion of these forms is required for progression and to ensure continued eligibility for WGRS funding.

7) Thesis requirements and deadlines are set by the School of Graduate & Post-Doctoral Studies. A Guide is available at http://grad.uwo.ca/.
BIOLOGY GRADUATE PROGRAM GUIDELINES AND REGULATIONS

1. EXPECTATIONS & RESPONSIBILITIES

A. Graduate Students

1. General comments on graduate theses
The thesis must contain a scholarly approach to the subject concerned and the student must display a thorough knowledge of the subject during an oral examination (thesis defense). While portions of a thesis may be submitted for publication, the contents of the thesis must represent a unified research project rather than a collection of unrelated projects. Acceptance of portions of the thesis for publication prior to the thesis defense does not mean examiners are obliged to accept the content of the thesis.

2. Expectations of a Master’s student and thesis
An M.Sc. student must complete research of good scientific quality under the guidance of the supervisor. In the thesis, the student shall provide the scientific background for the study, frame specific questions or hypotheses, present the results of appropriately designed experimental or observational studies, and interpret the findings in relation to the current literature in the field. Ideally, the results will lead to a publication(s) in a scientific journal. In general, an M.Sc. student shall demonstrate scientific thinking, problem solving ability, scientific communication, and industry.

3. Expectations of a Doctoral student and thesis
A Ph.D. student shall meet all of the expectations of a M.Sc. student with the following extensions of expectation. A Ph.D. student must demonstrate that a capability of original and independent work. The literature shall be reviewed in greater depth and with careful, critical analysis. The student shall have designed a sophisticated set of experiments or series of observations that will produce a substantial set of results. The interpretation of this set of results shall be critical and thorough, and the thesis should provide a vision for future work that would address unresolved questions raised in the thesis. The thesis research shall be of publishable quality. Ideally, in cases where it is possible, some or all of the thesis research will be published or submitted for publication prior to the defense of the thesis. The general expectations of a Ph.D. student include independence, creativity, originality, critical thinking, problem-solving abilities, scientific communication and industry.

4. Assessment to evaluate whether a student has met the above expectations
Students are assessed formally and informally throughout their progress through the Biology graduate program, with the major goal of providing feedback and guidance. The most important and obvious formal assessment is the oral defense of the thesis, which occurs at the end of the program (see Section 6). Other formal avenues of assessment include the proposal assessment (see Section 4), and for Doctoral candidates, the Comprehensive Examination (see Section 5). Advisory committee meetings (see Section 2.A.3) are an important source of less formal assessment and feedback. Additional opportunity for assessment comes from participation in
graduate student seminars, organized separately for each research stream (Biology 9100/9150, Part 2; see Section 3). Collectively, these formal and informal assessments help to ensure that a student is prepared for the thesis defense.

B. Supervisors

1) The supervisor should make and maintain a strong commitment to devote the required time and energy needed to successfully engage in graduate student supervision. As part of this commitment, the supervisor should display the highest ethical standards of behavior at all times.

2) Potential supervisors should have sufficient familiarity with the field of research to provide appropriate guidance and supervision, or indicate a willingness to gain that familiarity before agreeing to act as supervisor.

3) The supervisor should discuss with the student, very early on, any expectations and the relevant policies concerning authorship on publications, and issues surrounding ownership of intellectual property (this may include patents/licenses). This may result in written agreements or contracts between the supervisor and student covering these issues.

4) The supervisor should make the student aware, very early on, of program requirements and deadlines, various sources of funding, policies covering the conduct of research, and any relevant safety and/or workplace regulations. The nature of any financial support provided by the supervisor should be communicated clearly to the student, in writing, including such details as the amount of financial support, the length of time of such support, and any specific conditions pertaining to this financial support.

5) The supervisor should, very early on, discuss and formulate with the student a plan of study for completion of degree requirements and thesis work, with clear milestones denoting progress. This would include, for example, assisting the student in selecting and planning a suitable and manageable research project, as well as setting a viable time schedule and adhering to it for thesis progress and completion.

6) The supervisor should be available for regular consultation with the student. The supervisor and student should discuss and agree on an appropriate schedule for supervision meetings, and the supervisor should provide constructive and timely feedback to the student. More generally, the supervisor should maintain open communication and feedback with the student on all issues, including supervisory practices.

7) The supervisor should provide regular evaluations and assessments of the student’s progress and academic performance. This would include a review with the student and advisory committee, at least on an annual basis, of progress on thesis research and any other relevant degree requirements. The supervisor should then provide input to the program regarding the student’s progress.

8) The supervisor should make reasonable arrangements to ensure that adequate and appropriate research resources are available for the student’s thesis project.

9) The supervisor should help ensure that the research environment is safe, healthy, free from harassment, discrimination, and conflict. To this end, the supervisor should be aware of all pertinent regulations and policies covering these issues.
10) The supervisor should provide guidance, instruction, and encouragement regarding the research activities of student. The supervisor should help ensure that the student has access to intellectual resources and research opportunities, and should also encourage the dissemination of research results by publications and conferences.

11) The supervisor should monitor any major discrepancies in advice given to the student by members of the advisory committee and/or supervisor, and attempt to achieve resolution and consensus on the issue(s) involved.

12) The supervisor should be familiar with all program, School of Graduate & Post-Doctoral Studies, and University policies and procedures pertaining to graduate students and supervision, along with information on graduate student financial support.

13) The supervisor should make satisfactory alternative supervisory arrangements if away for a prolonged period of time.

14) The supervisor should inform the program (i.e., graduate chair or chair), in a timely fashion, of any serious difficulties which may arise in supervision. These might include major professional academic disagreements, interpersonal conflicts, or potential conflict of interest situations.

C. Co-Supervisors

There are three types of co-supervision: (1) co-supervision in which the co-supervisor is also a collaborator on the student’s project (i.e. joint supervision); (2) co-supervision between a new faculty member who holds limited membership in the School of Graduate and Postdoctoral Studies (SGPS) and a more senior member of the department who holds full SGPS membership (i.e. mentoring co-supervision); and (3) co-supervision between an adjunct faculty member and a faculty member of the department who holds full membership. All adjunct faculty wishing to supervise graduate students in Biology must do so with a co-supervisor who is a regular faculty member in the Department.

A co-supervisor has the same responsibilities as a regular supervisor with respect to all aspects of graduate student mentoring and progression, with two main differences (compared to “normal” supervision). First, the co-supervisor is not generally involved in day-to-day decision making with respect to data collection, experimental design/trouble shooting or laboratory/research group management in the lab group in which the student is primarily working. (Obviously there are degrees to which this applies, depending on whether a student's project involves work in more than one research group, including that of the co-supervisor.) Second, the co-supervisor generally does not have financial responsibility for the student's stipend.

The co-supervisor is meant, in part, to act as an overseer of student progression, making sure that committee meetings are being held regularly, proposal assessments and comprehensive exams (where applicable) are completed on time and, when necessary, provide guidance/wisdom regarding the appropriateness of student projects and theses (e.g., with respect to their level of difficulty, completeness or suitability for the target degree). Co-supervisors must be aware of and uphold the rules and regulations of the Biology Graduate Program, especially where they act in this capacity alongside adjunct colleagues who do not hold regular membership in the Department and are not involved in decision making with respect to the Graduate Program.
Finally, co-supervisors and named supervisors are not substitute supervisors. They do not represent one of two options for attendees at committee meetings, proposal assessments, comprehensive exams or thesis exams. The co-supervisor, alongside the named supervisor, shall be present for all of these important milestones.
2. DEPARTMENT OF BIOLOGY GRADUATE PROGRAM REGULATIONS

A. The Advisory Committee

1. Function of the Advisory Committee
   
a) The major roles of the Advisory Committee are to advise the student on matters pertaining to their program of study, and to evaluate student progression.

b) The Advisory Committee, in consultation with the student and Supervisor(s), will assign and approve graduate courses for the student.

c) The Advisory Committee, in consultation with the student and Supervisor(s), will assign the stream to which the student will belong: Cell and Molecular Biology, Ecology and Evolution, or Biochemistry and Physiology.

   Note: The choice of stream should primarily reflect the nature of a student’s thesis project. However, M.Sc. students are advised to take into account the stream affiliations of their advisors when choosing a stream, since the composition of their thesis examining board will be affected by their choice (see Section 6).

d) The Advisory Committee provides critical feedback and evaluation of the Thesis Proposal prior to its submission for assessment.

e) The Advisory Committee provides critical evaluation of the package of material planned for inclusion in a student’s thesis (see Section 2.A.3.e), and provides a critical checkpoint prior to thesis write-up and submission for examination.

f) Should the Advisory Committee consider the progress of a student unacceptable (see Section 2.B), the student will be informed immediately and a recommendation may be made to the Graduate Chair that the student be withdrawn from the program. If the Graduate Chair concurs with the Advisory Committee’s assessment, the student may appeal to the Chair of the Department.

2. Appointment and Composition of the Advisory Committee

a) Each student’s Advisory Committee will consist of the Supervisor(s) plus two or more additional faculty members, hereafter “Advisors”. At least one Advisor must be a regular or cross-appointed faculty member (not an adjunct) from the Department of Biology.

b) Advisors will be chosen by the Supervisor(s) and the graduate student. Once the Advisors have agreed to serve, the composition of the Advisory Committee should be communicated to the Graduate Program Coordinator.

c) A student or a Supervisor may request that the composition of the Advisory Committee be changed at any time. This change is not necessarily trivial, however, and may result in the need to embark on a new or modified research project especially if the change involves the Supervisor. Time limits to complete the degree are not extended by such a change.

d) A change in composition of the Advisory Committee should be made known in writing to the Graduate Chair, the Graduate Program Coordinator and the Advisor(s) affected.
e) A student may request a change of Supervisor through the Graduate Education Committee. The decision by a student to request this change should be taken after exploring all alternatives, ideally through discussion with the supervisor or, if necessary, through intervention by the university ombudsperson (see http://www.uwo.ca/ombuds/).

3. Meetings of the Advisory Committee

a) An initial meeting of the Advisory Committee should take place within six weeks of beginning the program. A “First Meeting” report sheet, detailing basic information about the student, their program of study, the committee and the project, must be filled out at this meeting, and returned to the Graduate Program Coordinator.

b) The purpose of an advisory committee meeting is to ensure that the student is making satisfactory progress towards timely completion of their graduate program, including course-work and thesis research, and to use the expertise and experience of the committee members to assist the student to overcome hurdles in this path. In most cases, it is helpful if the student prepares a brief written document reviewing the thesis objectives, hypotheses and experimental design, outlining progress towards completion, and noting any problems encountered that require assistance from the advisory committee or may require substantial changes to the thesis outline. This document should be submitted to the supervisor and advisory committee members with sufficient time (usually one week) for them to read it prior to the meeting.

c) For M.Sc. students, after the initial advisory committee meeting, it is recommended that the Advisory Committee meet prior to the student submitting their Thesis Proposal for assessment (i.e., before the end of the second term of registration), and provide feedback on the content of the Thesis Proposal. Thereafter, the Advisory Committee is required to meet formally with the student formally at least once each academic year. A “Progression Meeting” report sheet must be filled out at each meeting, and returned to the Graduate Program Coordinator. The outcome of this meeting may be used to determine a student’s eligibility to continue in the program (see Section 2.B below).

d) For Ph.D. Students, after the initial advisory committee meeting, and a follow-up meeting within the first academic year, it is recommended that the Advisory Committee meet prior to the student submitting their Thesis Proposal for assessment (i.e., before the end of the fourth term of registration), and provide feedback on the content of the Thesis Proposal document. Thereafter, the Advisory Committee is required to meet with the student formally at least once each academic year. A “Progression Meeting” report sheet must be filled out at each meeting, and returned to the Graduate Program Coordinator. The outcome of this meeting may be used to determine a student’s eligibility to continue in the program (see Section 2.B below).

e) The Advisory Committee must meet formally during the term prior to that in which thesis write-up would normally occur, and evaluate the completeness of the dataset proposed for the thesis. A useful strategy is for the student to prepare a mock Table of Contents, outlining the major topics to be covered in the thesis. The goal of this meeting is to determine whether there is sufficient data to compile a thesis and whether the student has progressed satisfactorily towards completing his/her thesis in the next term. A “Final Term Meeting” report sheet must be filled out at this meeting, and returned to the Graduate Program Coordinator. Potential outcomes of this meeting are:
(i) Progress is satisfactory, the project is complete and the student will be able to complete the thesis by the end of the next term. The Advisory Committee will check the Progress Satisfactory and Project Complete boxes on the “Final Term Meeting” form, with the expectation that the student will complete the thesis within the next term.

(ii) Progress is satisfactory, but the student does not have sufficient data for thesis completion within the next term. The Advisory Committee will check the Progress Satisfactory and Project Incomplete boxes on the “Final Term Meeting” form. The Advisory Committee must establish the reasons for the incomplete progress and determine, with the student, a timeline for the timely completion of the project. The student will be expected to complete the project and the thesis within the timeline established, with funding support from their supervisor according to existing Department policy.

(iii) Progress is unsatisfactory. The Progress Unsatisfactory box is checked on the “Final Term Meeting” form, and a follow-up meeting must be scheduled (see Section 2.B). If the project is also incomplete, then the Project Incomplete box is also checked. The Advisory Committee must establish the reasons for the incomplete progress and determine, with the student, a timeline for the timely completion of the progress (may occur in the follow up meeting). The student will be expected to complete the project and the thesis within the timeline established, without guaranteed funding support from their supervisor, according to existing Department policy.

f) Additional meetings of the Advisory Committee may be convened at the request of either the student, the supervisor(s) or advisors.

g) The student is responsible for arranging all Advisory Committee meetings and appraisals.

h) If an Advisory Committee meeting has not occurred within the time defined as a year (see Section 2.A.3.i below), an automatic rating of Unsatisfactory Progress will be submitted to the School of Graduate & Post-Doctoral Studies by the Graduate Chair.

i) A year is defined as being between March 1 and February 28/29 of the following year. All students, no matter which term they started in the program, must have an Advisory Committee each year between March 1 and February 28/29 of the following year.

j) In early October of each year, the Graduate Program Coordinator will send a message reminding students that an advisory committee must occur between March 1 and February 28/29 of the following year. Assessment of whether advisory committees have occurred will begin in the first two weeks of December each year. The Graduate Program Coordinator will examine all files and check which student files have a signed form that indicates an advisory committee has occurred in that ‘year’. The Graduate Program Coordinator will send out a spreadsheet indicating who has completed this requirement. By February 1 of each year, the Graduate Program Coordinator will contact those who have still not had an advisory committee meeting.

k) Progress of all graduate students will be reviewed by the Biology Graduate Education committee annually, at a meeting held in March.

l) If on February 28/29 of any year there are Graduate Students who have still not had an advisory committee meeting for that ‘year’, or who cannot demonstrate that one has been
scheduled for the earliest reasonable date, the School of Graduate & Post-Doctoral Studies will be informed, and a rating of ‘Unsatisfactory progress’ in the Biology Graduate Program will be noted. Unsatisfactory progress can result in the withholding of funding including the Western Graduate Research Scholarship and future teaching assistantships, and withdrawal from the graduate program.

B. Satisfying Progression Requirements

Progression through the requirements of the Graduate Program in Biology is evaluated annually via advisory committee meetings, as well as through a proposal assessment, comprehensive exam (Ph.D. only) and thesis. Each of these milestones provides an opportunity for the evaluation of the suitability of candidates for the program as well as the likelihood of their successful completion of all program requirements.

Successful completion of the Graduate Program in Biology requires that students complete all requirements satisfactorily. The consequences of poor performance in proposal assessments and comprehensive exams are outlined below (Section 4 and 5 respectively). However, continuance in the program also requires satisfactory progress in research as well as a demonstrated familiarity with the subject of the research. These two criteria are evaluated by the Advisory Committee via annual committee meetings (see Section 2.A.3 above).

When, as outcome of an Advisory Committee meeting, student progress is evaluated to be “Unsatisfactory”, the student is expected to make improvements (with appropriate guidance from their supervisor(s) and advisors), as demonstrated in a follow up meeting held no later than the end of the term following the term in which the “Unsatisfactory” evaluation is made. A second evaluation of “Unsatisfactory” may result in the student being withdrawn from the program.

C. Course Requirements

M.Sc. Candidates

Two half courses in Biology (or related field) at the graduate level, which can be chosen from any of the Biology or related graduate offerings.

Biology 9100y Graduate Research in Biology (See Section 3) is no longer listed as a course for new students as of September 2010. Instead it appears as a milestone (M.Sc. Research in Biology). Students enrolled in the graduate program prior to September 2010 will continue to be enrolled in Biology 9100y.

Ph.D. Candidates

4 half courses in Biology (or related field) at the graduate level, which can be chosen from any of the Biology or related graduate offerings.

Biology 9150y Graduate Research in Biology (See Section 3) is no longer listed as a course for new students as of September 2010. Instead it appears as a milestone (Ph.D. Research in Biology). Students enrolled in the graduate program prior to September 2010 will continue to be enrolled in Biology 9150y.
The Advisory Committee may recommend or require that additional courses be taken if they feel that the student lacks the required background for the student's research area. Some streams within the program have core (required) courses. Students may choose graduate courses offered by departments other than Biology, provided they are related to their field of study and provided that their supervisor(s) and advisors formally approve this request. A list of graduate courses, including course outlines, is posted on the Biology Graduate Program website.

Students must maintain a cumulative average of at least 70% calculated each term over all courses taken for credit, with no grade less than 60% to remain enrolled in the graduate program.

D. Change of Status from the M.Sc. Program to the Ph.D. Program

International students who first enrol in the M.Sc. program in May 2015 or later will not be permitted to transfer to the Ph.D. program. However, these students may complete their M.Sc. thesis requirements and apply separately for entrance to the Ph.D. program. International students already enrolled in the M.Sc. program on or before January 2015 are eligible to attempt the change of status, as described below, as are all domestic M.Sc. candidates.

Transfer to the Ph.D. program requires the successful completion of a Ph.D. Thesis Proposal Assessment as described in Section 4. Students who have initially enrolled in the M.Sc. program must first successfully complete the M.Sc. Thesis Proposal Assessment within two terms of registration and before the Ph.D. Assessment can be attempted. Regardless, the M.Sc. to Ph.D. Proposal Assessment must be completed at least one month prior to the end of the fifth term of registration in Graduate school, in order to meet School of Graduate & Post-Doctoral Studies deadlines for transfer to the Ph.D. program. If the assessment is not completed by the deadline, the student must complete the M.Sc. program before applying for admission to the Ph.D. program.

E. Continuous Registration and Maximum Registration Period

Graduate students must maintain continuous registration in the School of Graduate & Post-Doctoral Studies, either full-time or part-time, in each successive term from initial registration until the end of the term in which all requirements for the degree are completed.

Interruptions in continuous registration (e.g. Leave of Absence) or changes in status (e.g., full-time to part-time) must be requested through the Biology Graduate Education Committee. Final approval must come from the School of Graduate & Post-Doctoral Studies.

Normally, degree programs are completed within a period not exceeding two calendar years (six terms) from initial registration in the case of the Master’s degree (if registered full-time), and four calendar years (12 terms) from initial registration in the case of a Doctoral degree (if registered full-time). For students who transfer from a Master's program to a Doctoral program without completing the Master's program, a maximum of five calendar years (15 terms) from the initial registration in the Master's program will be given to complete the Doctoral degree (if registered full-time).

F. Financial Responsibilities of the Department and the Supervisor

For graduate students who do not receive sufficient external funding (e.g. NSERC, OGS or other major external scholarships) the Department and the Supervisor undertake to provide financial support throughout the period of funding eligibility. This corresponds to 2 years (six terms) for M.Sc. candidates, 4 years (12 terms) for Ph.D. candidates, and 5 years (15 terms) for students
that transfer from the M.Sc. to the Ph.D. program. Part of this support is provided in the form of a Graduate Teaching Assistantship. Such Teaching Assistantships are typically held during the fall and winter terms, although a few summer Assistantships are available each year. Students who maintain a minimum mark average of 70% (or as dictated by the SGPS), are eligible for a Western Graduate Research Scholarship. Finally, students are provided with financial support during the 4 month summer term. Normally, the supervisor provides this from research funds, unless the student is receiving an external award for the term. Eligibility for funding beyond the outlined timelines for each degree is not guaranteed.

G. Extensions to Degree Completion Time

Students who require longer than the maximum registration time to complete their degree program (see Section 2.E above) do so without a guarantee of financial support from the department or their supervisor. Students requiring longer than the maximum time must have a committee meeting within four months of the maximum registration date. The committee meeting must indicate that the student is making satisfactory progress, provide a detailed timeline for completion, and include a separate letter of support from their supervisor that includes details of the expected financial support, if any, for the student during the period of extension.

H. Appeals

An appeal is a request for exemption from a Departmental or Senate regulation on compassionate or medical grounds or because of extenuating circumstances; or a request that a grade on a particular piece of work or a final standing in a course or program be changed.

Conflicts should be resolved at the lowest level possible. For graduate students, the successive levels for an appeal are:

* Course Instructor (if applicable)
* Graduate Chair
* Provost of the School of Graduate & Post-Doctoral Studies
* Senate Review Board Academic (SRBA)

Appeals relating to a specific course (e.g., against a mark, grade, appropriateness of assignments or examinations, or grading practices) must be initiated with the appropriate course instructor.

Appeals on other matters should be initiated in the office having immediate jurisdiction on the particular requirement or regulation in question. Students in doubt as to the appropriate level at which appeals should be initiated should consult the Departmental Graduate Chair.

The initial step of the appeals procedure should be completed as soon as possible but no later than six weeks from the date of action of the decision giving rise to the appeal. It is, therefore, the responsibility of the student to initiate an appeal at the earliest possible opportunity and for the university officer concerned to act upon the request as expeditiously as possible.

Legal counsel is not permitted below the level of the SRBA. However, the appellant does have the right to be accompanied by a colleague.

In the case of an appeal relating to a specific course:

1) A resolution of the problem should first be attempted through informal consultation with the instructor. If the instructor will not meet, or will not be physically available within a reasonable time period, the appeal may be forwarded directly to the Graduate Chair.
2) If the student is dissatisfied with the decision made by the instructor, a written statement of appeal may be made to the Graduate Chair within three weeks of the date of the previous decision. The written request need not be lengthy but should indicate clearly the details of the appeal and the relief requested. The Graduate Chair, within three weeks of the receipt of the formal appeal, will call a meeting of an Ad-Hoc Committee of Appeal (AHCA). This committee will consist of at least the following:

* The Graduate Chair
* A Departmental member, appointed by the Graduate Education Committee, who is also a member of the School of Graduate & Post-Doctoral Studies and who is not the instructor being challenged
* A Biology graduate student appointed by the Society of Biology Graduate Students (SOBGS).

The AHCA may ask other persons concerned to appear at the meeting.

Note: If the complaint is against the Graduate Chair, the Department Chair or designate will act in the Graduate Chair’s place.

The Graduate Chair, on behalf of the AHCA, will notify the appellant and professor, in writing, of the committee’s decisions and recommendations (including reasons for the decision) within one week of the meeting.

3) Following an appeal to the Graduate Chair, the student, if not satisfied with the decision of the committee, may then appeal to the Provost of the School of Graduate & Post-Doctoral Studies. (See School of Graduate & Post-Doctoral Studies, General Information, Section I, Petitions and Appeals.)

In the case of an appeal that is a request for exemption from a Departmental regulation, the procedures are the same except that the process begins with informal consultation with the Graduate Chair.

For appeals of decisions made by M.Sc. assessment/thesis examining committees and Ph.D. assessment/comprehensive exam committees, a written statement of appeal may be made to the Graduate Chair with three weeks of the date of the previous decision. The Graduate Chair, within three weeks of the receipt of the formal appeal, will call a meeting of an Ad-Hoc Committee which will consist of at least the following:

* The Graduate Chair
* The Department Chair
* The Supervisor
* Two members of the Department of Biology who have membership in the School of Graduate & Post-Doctoral Studies and who were not involved in the original deliberations.
* A student representative from the Society of Biology Graduate Students.

The Graduate Chair, on behalf of the Committee, will notify the appellant, in writing, of the committee’s decision within one week of the meeting. If not satisfied with the decision of the Ad-Hoc Committee, the student may then appeal to the Provost of the School of Graduate & Post-Doctoral Studies.
3. BIOLOGY 9100/9150y- GRADUATE RESEARCH IN BIOLOGY

Biology 9100y/9150y is required, as either a course or a milestone, for all graduate students in the M.Sc. (9100y) or the Ph.D. (9150y) program. Students who enrolled in a graduate program September 2010 or later have this appear as a milestone on their academic record. Students who enrolled before September 2010 have Biology 9100y/9150y appear on their record as a course; the Graduate Program Coordinator will ensure their continued enrollment in this each term. The components of the course differ for M.Sc. and Ph.D. candidates. This mandatory course/milestone charts your progress through the program. This is a PASS/FAIL course/milestone and numerical grades are not assigned.

M.Sc. Candidates: M.Sc. Research in Biology milestone for students enrolled September 2010 or later/Biology 9100y for students enrolled prior to September 2010

Part 1: Introduction to Graduate Research in Biology (Covered during Orientation)
Part 2: Research Communication (stream-specific seminar series)
Part 3: Thesis Proposal Assessment (see Section 4)

Ph.D. Candidates: Ph.D. Research in Biology milestone for students enrolled September 2010 or later/Biology 9150y for students enrolled prior to September 2010

Part 1: Introduction to Graduate Research in Biology (Covered during Orientation)
Part 2: Research Communication (stream-specific seminar series)
Part 3: Proposal Assessment (see Section 4)
Part 4: Comprehensive Examination (see Section 5)

Students enrolled in Biology 9100/9150y as a course will receive an IPR (in progress) for the course until their final term. In the last term, a PASS mark is given if all conditions have been fulfilled. If a FAIL/WITHDRAW has been assigned for any one of the parts of 9100/9150y, the student will be required to withdraw. Students enrolled in Biology 9100/9150y as a milestone will have their completion recorded in their final term if all components have been completed.

**Part 1: Introduction to Graduate Research in Biology**
This is covered in the Orientation session for new Biology graduate students. Those enrolled in Biology 9100y/9150y prior to September 2010 will have attended a different series of lectures and workshops.

**Part 2: Research Communication, Student Seminar Series.**
Each research stream within the Department (Ecology & Evolution; Cell & Molecular Biology; Physiology & Biochemistry) organizes its own graduate student seminar series, and each stream has distinct expectations of students for fulfillment of this requirement. As a minimum, all M.Sc. candidates (Biology 9100y) must present at least one research seminar and all Ph.D. candidates (Biology 9150y) must present at least two research seminars. However, some streams require additional presentations, which must be completed to fulfill this component. See the coordinators for details.
Details for 2015-2016:

**Cell & Molecular Biology**
Coordinators:
Anthony Percival-Smith (main campus)

Rima Menassa (AAFC)

Attendance: Mandatory
Winter term only

**Physiology & Biochemistry**
Coordinator:
TBA

Attendance: Mandatory
Winter term only

**Ecology & Evolution**
Coordinator:
André Lachance

Attendance: Mandatory
Fall and Winter terms

---

**Part 3: Thesis Proposal Assessment**
See Section 4. Students transferring to the Ph.D. from the M.Sc. should also refer to Section 2.D.

**Part 4: Comprehensive Examination**
For Ph.D. students only. See Section 5.
4. THESIS PROPOSAL ASSESSMENTS

A note to Graduate Students: You are strongly encouraged to convene an advisory committee meeting before submitting your thesis proposal, to discuss the substance of the proposed research. In preparing your written proposal, follow the format indicated below. Review the draft proposal(s) with your supervisor(s), allowing sufficient time for repeated rounds of revision. In general you should allow one week per draft for a faculty member to read and comment and for you to incorporate their feedback. You are strongly encouraged to review your near-final proposal with any advisors not acting as Assessors, and to seek out opportunities for practice exams with your Supervisor and/or fellow students.

A note to Supervisors: You should be familiar with the process, expectations, potential outcomes and consequences of the Proposal Assessment such that you can explain these clearly to the Graduate Student. Help the student to identify potential Assessors. Provide guidance to the student in developing the proposal, through discussions as well as comments on written drafts. Assist the student in preparing for the assessment exam through discussions and practice questions as necessary. During the rounds of questioning in the Proposal Assessment, keep quiet and do not answer questions on the student's behalf: remember that this milestone assesses the student's proposal and preparation, not your research program. You will have the opportunity to comment when the rounds of questions are completed. If a revised proposal or a second Assessment is necessary, provide guidance to the Graduate Student in their preparations.

A note to Assessors: Please respond promptly to the Graduate Student’s request to set a date and time for their Assessment. After receiving the written proposal from the Graduate Program Coordinator, read it in advance of the assessment and develop questions for the Graduate Student. Remember that this is a proposal assessment and not a thesis defense. Although in many cases the Graduate Student will present preliminary data, in other cases (e.g. Master’s candidates who have not yet begun their first field season) you should not expect such data to be included in the proposal. Your role is to evaluate the significance, scope and feasibility of the proposed research, and whether the Graduate Student is capable of completing it in a timely manner.

A. M.Sc. Thesis Proposal Format and Guidelines

The M.Sc. proposal has a maximum length of 8 pages, double-spaced, excluding figures and references. Up to two pages of Figures/Tables and additional pages – no limit – for references may be appended. The proposal should be prepared using 12 point font and a minimum of one-inch (2.54 cm) margins.

The written proposal should contain:
- The scientific background of the study.
- Clear and well-expounded question(s) to be addressed (i.e., the hypothesis to be tested).
- The methods to be used for collecting and/or analyzing data and an explanation of how these methods meet the objectives, test the hypothesis(es), or answer the research question posed, as appropriate.
- The methodology to be used for collecting and/or analyzing data.
- Preliminary results if they exist.
- A time-line for the completion of the data collection/data analysis or the experiments.
- A summary of the research proposal.
The order of presentation of these elements and the emphasis placed on these elements is dictated by the topic to be studied.

**B. Ph.D. Thesis Proposal Format and Guidelines**

The Ph.D. proposal will be written in a modified NSERC grant application (Form 101) for a Discovery Grant, complete with a budget and budget justification. Please contact the Graduate Program Coordinator for the fillable NSERC forms.

Students are responsible for adhering to the NSERC guidelines, subject to modifications below, but are not expected to complete every form that is required of professors. Specifically, the Ph.D. thesis proposal must include the following components:

**Form 101 Part I**
1) Page 1 – contact information
2) Page 3 – summary of the proposed research in lay terms
3) Page 4 – activity schedule
4) Page 5 – budget summary
5) Supplementary pages to accompany the budget (rationale/justification for expenditures).
6) Form 101 Part I Appendix A ONLY IF it applies to the project. Students may list all of their field sites on a single Appendix A.
7) Form 101 Part I Appendix B ONLY IF it applies to the project.

**Form 101 Part II - free form**
1) Up to 10 double-spaced pages using 12 point font and a minimum of one-inch (2.54 cm) margins for a detailed research proposal
2) Up to an additional 2 pages for figures and tables; these should be cited in the text of the research proposal and can be for background or to illustrate progress to date
3) Additional pages for references cited; these should be single-spaced and include a full list of authors and the full title of the article. Note that more than 1 page is allowed for the reference list.

When writing the 10-page research proposal, students should (1) summarize their recent progress in research activities related to the proposal; (2) articulate goals or objectives, both short and long term; (3) literature pertinent to the proposal ensuring that they place the proposed research within the context of what is currently happening in the field; (4) describe a research plan and methods that are well laid-out; (5) explain the significance of the potential findings, as well as plans for future options; and (6) ONLY IF the student will be supervising fourth-year thesis students or field/lab assistants, indicate how the project contributes to the training of HQP.
C. Organizing the Assessment Exam

Deadlines for completing the proposal assessment are listed on page 1 of this handbook (Digest of Important Information and Dates). Extensions beyond these deadlines must be approved by the Graduate Chair and normally require medical, compassionate or other severe extenuating grounds. Failure to complete the proposal assessment by the deadline will result in an automatic outcome of “Assessment Failed; Candidate required to take a second Examination”. In this case the outcome of an assessment at a later date can only be “Passed; Candidate recommended for the (M.Sc./Ph.D) program” or “Assessment failed; Candidate required to withdraw from program”.

Early in the student’s second term (M.Sc.) or fourth term (Ph.D.), the Supervisor and/or Graduate Student suggest to the Graduate Program Coordinator the names of three faculty members who have agreed to serve as assessment examiners (Assessors). This suggested committee must be provided to the Graduate Program Coordinator no later than three weeks before the scheduled assessment for approval.

For both M.Sc. and Ph.D. assessments, Assessors include three faculty members, two from within the student’s stream and one from outside the student’s stream (i.e. belonging to a different stream or from outside of Biology). Up to one Assessor may be a non-regular faculty member of the Department of Biology (e.g. Adjunct). Up to two Assessors may be chosen from the student’s advisory committee, provided the stream composition requirement is satisfied. A list of faculty affiliated with each of the graduate streams can be found at http://www.uwo.ca/biology/graduate/current/faculty_affiliations.html.

Once the proposed Assessment Committee has been approved, the student coordinates a date and time for the Assessment Exam, through consulting with all three Assessors as well as the Supervisor(s). The student reserves a suitable room and any required audiovisual equipment, then informs the Graduate Program Coordinator of the date, time and location of the Assessment. The Graduate Program Coordinator appoints an Assessment Chair based on availability at the specified time, with the goal of equal participation of all eligible faculty within the department.

Note: All Assessors and Supervisor(s) are expected to be physically present at the assessment. In extreme circumstances, however, an Assessor may participate remotely via conference call, video chat or similar. This arrangement must be agreed to in advance by all participants, and approved by the Graduate Chair, at the time of scheduling.

D. Submitting the Thesis Proposal

Students must submit their proposal to the Graduate Program Coordinator at least two weeks prior to the scheduled Proposal Assessment, for distribution to the Assessment Committee. Proposals may be submitted in either electronic format (one PDF) or paper format (six hard copies or seven if there is a co-supervisor), and must include a copy of the “Approval of Proposal for Distribution” form signed by the supervisor(s), again in either electronic or paper format. Late submissions (i.e. less than two weeks before the scheduled Assessment) will result in a rescheduling of the Assessment, and a possible “Fail- Retake” outcome (Section 4.F).

After submitting the proposal, but before the scheduled Assessment, the student prepares a 15-20 minute presentation describing the background of their project, a clear description of the
hypothesis being tested, the experiments or methods to be used to address the hypothesis, and any preliminary data.

E. Proposal Assessment Examination Procedure

1) The Graduate Student arrives at the room shortly before the appointed time to set up for his/her oral presentation.

2) The Chair will collect the Graduate Student’s file and the “Record of Assessment Committee Meeting for M.Sc./Ph.D. Candidate” form or the “Change of Status from M.Sc. to Ph.D.” form, as appropriate, from the Graduate Program Coordinator in advance. Chair: The Graduate Student's file is open to you only. You may reveal the Graduate Student's performance in course work if requested.

3) The Chair shall request that the student leave the examination room. The Chair shall inform the Assessment Committee of the potential outcomes of the Assessment (refer to Section 4.F or 4.G as appropriate). Note that if it is the second Assessment, or if the Graduate Student's written proposal was late, the only possible outcomes are:

   Passed; Candidate recommended for the M.Sc./Ph.D. program; or

   Assessment failed; Candidate required to withdraw from the program

4) The Chair shall discuss the assessment process with the Assessors if necessary. The Chair will then ask the Assessors how many rounds of questions they wish to ask (usually two), the time for each examiner per round of questions (usually 10-15 minutes), and the order of questions.

5) The Chair will invite the Graduate Student back into the room and ask the Graduate Student to give his/her presentation. The presentation should be about 15 minutes long, but no longer than 20 minutes. The Chair shall keep the Graduate Student within his/her time for the presentation.

6) Following the presentation, the Chair will invite the Graduate Student to sit down and will inform the Graduate Student of the number of rounds of questions, the time for each round, and the order of Assessors asking the questions.

7) The Chair will ask the first Assessor to start asking questions. The Chair shall time the question sessions and shall keep the Assessors to their allotted time. At no time during the questioning should the Supervisor(s) intervene. Similarly, no questions should be directed to the Supervisor(s).

8) Between the first and second rounds of questions, the Chair will determine whether a brief recess is required by either the Graduate Student or the Assessors, and allow a suitable time if a recess is required (generally 5-10 minutes).

9) At the end of the final round of questions, the Chair will ask the Graduate Student to leave the examination room.
10) The Chair invites the Supervisor(s) to comment on the Graduate Student, their proposal and performance in the assessment exam.

11) The Chair invites the Assessors to comment on the student’s proposal and performance. This shall include discussion of the written proposal, both form and content, the oral presentation, and the oral defense.

12) The Assessors shall come to a consensus (or majority vote if necessary) on the performance of the Graduate Student, choosing one of the outcomes outlined in Section 4.F or 4.G below.

13) The Chair shall enter this outcome on the “Record of Assessment Committee Meeting for M.Sc./Ph.D. Candidate” form, along with any remarks and suggestions or requirements. In particular, when the outcome is Assessment passed; written proposal inadequate or Assessment failed; Candidate required to take a second assessment examination, the remarks section should clearly indicate the reasons for the outcome, and what the Graduate Student must do to suitably revise his/her proposal and/or improve his/her understanding of the proposed research.

14) The Chair shall invite the Graduate Student back into the room, and inform him/her of the committee's decision and any subsequent procedures (e.g. necessary revisions and deadlines) associated with this outcome.

15) The Chair shall ensure that all concerned sign the “Record of Assessment Committee Meeting for M.Sc./Ph.D. Candidate” form.

16) The Chair shall return the “Record of Assessment Committee Meeting for M.Sc./Ph.D. Candidate” form and the Graduate Student's file to the Graduate Program Coordinator.

F. Proposal Assessment Outcomes and Consequences (M.Sc. and Ph.D.)

There are four potential outcomes of this Proposal Assessment: (a) Passed; Candidate recommended for the (M.Sc./Ph.D.) program; (b) Assessment passed, Written proposal inadequate; (c) Assessment Failed; Candidate required to take a second examination before (date); (d) Assessment Failed; Candidate required to withdraw from the program. The choice of outcome depends in part on whether it is a first or a second attempt at the Assessment.

a. Passed; Candidate recommended for the (M.Sc./Ph.D.) program. Both the written proposal and the Graduate Student’s performance in the oral defense are found to be satisfactory.

b. Assessment passed; Written proposal inadequate. The Graduate Student is considered to have passed the assessment, provided that an acceptable modified proposal is presented to the Graduate Coordinator for distribution to each Assessment Committee member by a specified date (usually within two weeks of the original exam). This outcome arises when the Graduate Student has performed satisfactorily in the oral defense but some problems are found in the written proposal. The written proposal may be found unacceptable due to major problems with the organization, grammar, style, or spelling, or due to minor problems with the scientific quality including content, clarity of the question asked, or another substantive consideration. When the revised proposal is received, the Assessors shall read and evaluate it as being either a Pass or requiring further revision. Examiners are required to indicate their approval of the revised
proposals in writing to the Graduate Education Committee Chair and Graduate Program Coordinator within one week of receipt. If further revision is required, the student will be required to meet with the Assessors to establish what remains to be done. The Chair of the Graduate Education Committee, as well as members of the Advisory Committee shall attend.

c. **Assessment Failed; Candidate required to take a second examination before (date).** This decision can come about due to factors that relate to the Graduate Student's perceived comprehension of the proposed research. The oral defense of the proposal was unacceptable either because the student did not demonstrate a good understanding of his/her own proposal, or the answers to the Assessors' questions were inadequate. If this is the case, a modified proposal may or may not be required and a second oral examination is scheduled. The outcome of the second assessment may only be “Passed; Candidate recommended for the (M.Sc./Ph.D.) program” or “Assessment failed; Candidate required to withdraw from program”. That is, there is only one retry.

d. **Assessment Failed; Candidate required to withdraw from the program.** This outcome results from a student failing their second attempt at the proposal assessment; or from a student failing to meet the assessment deadline then failing the late assessment.

Successful completion of the Proposal Assessment is part of the requirement of Biology 9100y/9150y (Section 3).

**G. Proposal Assessment Outcomes and Consequences (M.Sc. to Ph.D. Transfer)**

There are three potential outcomes of this Proposal Assessment: (a) **Recommended for change of status to a Ph.D.**, (b) **Assessment passed, Written proposal inadequate**; and (c) **Not recommended for a change of status**.

a. **Recommended for change of status to a Ph.D.:** This is equivalent to Passed (Section 4.F.a above): the student is permitted to change status from the M.Sc. to the Ph.D. program.

b. **Assessment passed, Written proposal inadequate:** The Graduate Student is considered to have passed the assessment and will be permitted to change status from the M.Sc. to the Ph.D program, provided that an acceptable modified proposal is presented to each Assessment Committee member by a specified date (usually within two weeks of the original exam). Procedures are identical to those described in Section 4.F.b, above.

c. **Not recommended for a change of status:** The factors taken into account in arriving at this outcome are equivalent to those in 4.F.c above (Assessment Failed; Candidate required to take a second examination). However, there is no option to be re-examined for change of status. In this case, the Graduate Student continues in the M.Sc. program completing his/her research and thesis for examination. Note that this outcome does not preclude subsequently applying for entry to the Biology Ph.D. program. If the Graduate Student wishes to pursue a Ph.D. degree, he/she may apply for admission to the Ph.D. program, and may be admitted as a Ph.D. candidate after completion of the M.Sc. degree.
5. COMPREHENSIVE EXAMINATION PROCEDURE (Ph.D. Only)

The Comprehensive Examination evaluates a doctoral candidate’s breadth of scientific knowledge, extending beyond the specifics of their dissertation research. It is not an exercise in memorization, nor an extension of the proposal assessment, but instead an opportunity for the candidate to demonstrate (and examiners to assess) their autonomy and scientific maturity.

A. Organizing the Comprehensive Examination

Deadlines for completing the comprehensive examination are listed on page 1 of this handbook (Digest of Important Information and Dates). Extensions beyond these deadlines must be approved by the Graduate Chair and normally require medical, compassionate or other severe extenuating grounds. Failure to complete the Comprehensive Examination by the deadline will result in an automatic outcome of “Fail-Redo”. In this case the outcome of an assessment at a later date can only be “Pass” or “Fail-Withdraw”.

Comprehensive Examination Committee: In the term before the examination is to be held, and no less than three weeks before the scheduled preparatory meeting, the Supervisor and Candidate suggest to the Graduate Program Coordinator the names of three potential Examiners (see below). The Examiners comprise three faculty members who represent different fields of expertise relevant to the Candidate’s discipline. There is no stream requirement (i.e. it is permissible for all three Examiners to belong to the same stream). At least two of the Examiners must be regular faculty members in the Department of Biology. A maximum of one Examiner may be from outside the Department, provided he/she holds membership in the School of Graduate & Postdoctoral Studies (SGPS), or an Adjunct Faculty Member with SGPS membership. Finally, a maximum of one Examiner may be chosen from among the Candidate’s advisors. The Graduate Chair will review and approve the proposed Examination Committee to ensure that there is both breadth and relevance to the general topic area of the thesis.

Preparatory Meeting: Once the Comprehensive Examiners have been approved by the Graduate Chair, and 8-10 weeks before the anticipated Comprehensive Exam, the Candidate arranges and convenes a meeting with the Examiners and Supervisor(s). This purpose of this preparatory meeting is to identify the areas in which each Examiner will question the Candidate. One week before the preparatory meeting, the Candidate will provide the Examiners a one-page summary of their project and its objectives, to assist in identifying topic areas. The preparatory meeting should not take place before the student receives official approval of the suggested examiners from the Graduate Program Coordinator.

The Preparatory Meeting is chaired by the Candidate’s Supervisor, and involves establishing the areas of concentration (topics) that each Examiner will focus on during the Examination itself. The Examiners, Candidate and Supervisor(s) shall discuss the appropriateness and breadth of the topics proposed by the Examiners. These areas of concentration must be agreed to by all concerned and recorded on Form 1. Expectations and potential outcomes as outlined in Section 5.B.10 must also be discussed with the Candidate at the Preparatory Meeting. Note that the Candidate is responsible for having Form 1 in his/her possession at the Preparatory Meeting, and must submit the completed Form to the Graduate Program Coordinator within one week of this meeting.
**Suggested Readings:** Examiners may suggest appropriate reading material (papers, textbooks etc.) but need not assign specific readings. Any suggested or assigned readings are meant to represent a starting point and do not necessarily define the limits of the assigned topic. Since the purpose of the Comprehensive Examination is to assess the Candidate’s general knowledge, autonomy, and scientific maturity, part of the evaluation may focus on the Candidate’s ability to identify the important literature for a given topic.

**Following the Preparatory Meeting:** Examiners are expected to make themselves available to Candidates preparing for the Comprehensive Examination (within reasonable limits) and assist them in their preparation. However, Examiners are not expected to meet with students until within 8-10 weeks of the anticipated examination date (i.e. the Preparatory Meeting). Candidates are expected to make appointments with their Examiners, arrive promptly for their appointments and be prepared to discuss the assigned material.

**Scheduling the Comprehensive Examination:** The Comprehensive Examination must occur within 8-10 weeks of the Preparatory Meeting, and before the deadline noted on page 1 of this handbook. The Candidate shall arrange the date and time for the Examination in consultation with the three Examiners and the Supervisor(s), and reserve a suitable room. The Candidate shall inform the Graduate Program Coordinator of the date, time and location of the comprehensive examination. The Graduate Program Coordinator will then appoint a Chair of the Comprehensive Examination, based on availability at the specified time, with the goal of equal participation of all eligible faculty within the department.

*Note: All Examiners and Supervisor(s) are expected to be physically present at the Comprehensive Examination. In extreme circumstances, however, an Examiner may participate remotely via conference call, video chat or similar. This arrangement must be agreed to in advance by all participants, and approved by the Graduate Chair, at the time of scheduling.*

**B. The Comprehensive Examination Itself**

The Comprehensive Examination normally lasts from 2.5 to 3 hours, and proceeds as follows:

1) The Chair of the Comprehensive Examination obtains the Candidate’s file from the Graduate Program Coordinator. The file is open only to the Chair. The Chair may reveal course marks if requested.

2) The Candidate, Examiners, Supervisor(s) and Chair meet promptly at the appointed time and place.

3) The Chair invites the Candidate to leave the examination room. The Chair informs the Comprehensive Examination Committee of the potential outcomes of the examination. If it is the first Examination, the potential outcomes are *Pass with Distinction*; *Pass*; *Fail-Redo*; or *Fail-Withdraw*. If it is the second Examination, or if the Examination is being held late, the potential outcomes are *Pass*; or *Fail-Withdraw*. The Chair discusses the Comprehensive Examination process with the Examiners if necessary, and asks the Examiners the order in which they wish to question the Candidate as well as the duration of the questioning (typically a single round of 30 – 45 minutes per examiner).
4) The Chair invites the Candidate back into the examination room and invites him/her to sit down. The Chair informs the Candidate the order in which the Examiners will be asking the questions and the duration of each question period.

5) The Chair invites the first Examiner to begin. Each Examiner uses his/her allotted time to ask questions of the Candidate, and develop a dialogue within their designated topic. At any time, other Examiners may ask a question about the topic under discussion. The Chair times the question sessions and ensures that the main Examiner for a topic is allowed sufficient time to question the Candidate within the allotted time for his/her topic. The Chair makes notes regarding the scope of questions.

At any appropriate time, the Chair may ask the Candidate and Examiners if they would like to take a brief recess.

6) At the end of the questions, the Chair asks the Examiners if there are any additional questions and allow a brief time (5-10 minutes) for this.

7) The Chair invites the Candidate to leave the examination room.

8) The Chair invites the Supervisor(s) to comment on the Candidate's performance.

9) The Chair invites the Examiners to comment on the Candidate's performance.

10) The choice of potential outcomes of the Comprehensive Examination depends on whether it is a first, second or late examination (see Section 5.A above). The Examiners should come to a consensus (or by majority vote if necessary) on the outcome of the Comprehensive Examination. The potential outcomes and summaries of their meanings are outlined below:

    - **Pass with Distinction**: This is a rare outcome. The Candidate demonstrated an outstanding mastery of the material to the point of being as knowledgeable and clear as the Examiners or Supervisor.

    - **Pass**: The Candidate was confident and generally correct when answering the questions. The Candidate demonstrated sufficient mastery of the material to proceed in the program and seemed confident with the assigned material and general Biology. There may be some suggestions for how the Candidate can strengthen her/his background knowledge.

    - **Fail-Redo**: The Candidate was unable to answer the questions to a point that the Examiners believe the Candidate lacks the general knowledge of the assigned material and/or general Biology. A second examination is required, the deadline of which shall be discussed before the Candidate returns to the examination room. The Examiners may provide some guidance for how the Candidate may better prepare for the second examination.

    - **Fail-Withdraw**: This occurs after the second attempt (or in a late examination) if the Candidate remains unable to answer the questions, thereby demonstrating a lack of general knowledge of the assigned material and general Biology that are of general significance to the Candidate's sub-discipline.

11) The Chair indicates the outcome on Form 2 for the Comprehensive Examination.
12) The Chair invites the Candidate back into the room and informs him/her of the outcome. If the outcome is *Fail-Redo*, the Chair communicates to the Candidate the time frame for when the next examination needs to be scheduled.

13) The Chair ensures that she/he, and the Candidate, have signed Form 2 for the Comprehensive Examination, then returns this Form and the Candidate’s file to the Graduate Program Coordinator.

### 6. THESIS

Requirements for the preparation and defense of M.Sc. and Ph.D. theses, including information on the electronic submission process and formatting, as well as the timelines required by the School of Graduate and Postdoctoral Studies (SGPS), are outlined on the SGPS website at: https://grad.uwo.ca/current_students/thesis/index.html.

SGPS thesis regulations are outlined on the following website: http://grad.uwo.ca/current_students/regulations/8.html

Theses must be free of typographical, grammatical and spelling errors prior to submission for examination. In addition, all required sections of the thesis (including dedications, acknowledgments, approvals for animal use, and curriculum vitae) must be included in the submitted copy. Incomplete theses and/or theses that are difficult to read because of poor writing are unacceptable and may be rejected and returned to the student for correction and resubmission. Students should consult SGPS guidelines prior to preparation of the thesis.

*For both M.Sc. and Ph.D. theses*, the supervisor and one other designated reader not involved as an Examiner (usually, but not necessarily, an advisor) must sign a Certificate of Approval Form to indicate whether the thesis is ready for examination. This form can be obtained from the Graduate Program Coordinator. For students with two supervisors (either two joint or a primary supervisor plus co-supervisor), both supervisors must sign the form but the requirement for an additional designated reader may be waived.

Importantly, the thesis examiners are not copy editors, and the supervisor(s) and designated reader should not sign the Certificate of Approval unless the thesis is acceptable in both form and content. In rare cases where the thesis is submitted without the approval of the supervisor(s) and/or designated reader, this must be indicated on the Certificate of Approval and reasons for withholding approval provided, in writing, to the Graduate Program Coordinator. Designated readers with serious concerns about the readiness of a thesis for examination should meet with the student and supervisor(s) to discuss the concerns, as well as providing written feedback, but may elect not to re-review the thesis a second time.

Students should allow a reader at least two weeks for review of a MSc thesis or at least three weeks for review of a PhD thesis (depending on the reader’s schedule, more time may be required). Readers are expected to review a thesis draft only once. At that point they should identify any necessary revisions and the approximate time frame required to make the changes, and convey this feedback to both the student and the supervisor. At this point it becomes the responsibility of the student, overseen by the supervisor, to ensure that the recommended changes are made.
A. M.Sc. Thesis in Biology

1) A signed Certificate of Approval form as well as Master’s Supervisor Approval (which are prepared by the Graduate Program Coordinator) must be submitted to the Graduate Program Coordinator at least three weeks before the thesis defense. Once these forms are received by the Graduate Program Coordinator, authorization can then be given to the student to submit the electronic thesis via the Scholarship@Western site. Please note that paper submission of the thesis is no longer accepted. The defense normally will not take place in fewer than three weeks after the thesis has been submitted.

2) The M.Sc. candidate or supervisor must submit the names of three proposed Examiners (see requirements below) to the Graduate Program Coordinator no less than five weeks before the intended date of thesis submission. Failure to complete this task on time will result in the examination date being delayed.

Composition of Master’s Thesis Examination Committee:

1. One Biology faculty member from within the student’s stream* (may be an advisor)
2. A second Biology faculty member from within the student’s stream (not an advisor)
3. One Biology faculty member from outside the student’s stream (not an advisor)

* A list of faculty affiliated with each of the graduate streams can be found at http://www.uwo.ca/biology/graduate/current/faculty_affiliations.html.

OR

1. One Biology faculty member (stream does not matter; may be an advisor)
2. A second Biology faculty member (stream does not matter; not an advisor)
3. One faculty member of another department at Western (not an advisor)

For students in the Collaborative Program in Environment & Sustainability the recommended composition is as follows (if not possible follow either of the alternatives above):

1. One Biology faculty member (stream does not matter; may be an advisor)
2. One Biology faculty member (stream does not matter; not an advisor)
3. One faculty member (not an advisor) who is associated with the Centre for Environment & Sustainability, from outside of Biology (not an adjunct or cross-appointed to Biology).

All examiners must have membership through the School of Graduate and Postdoctoral Studies.

4) The M.Sc. thesis form and content must be judged acceptable by a majority of the examiners before the defense may proceed. An electronic evaluation form shall be submitted by each examiner to the School of Graduate and Postdoctoral Studies at least three days before the defense for electronic thesis submissions or paper evaluations for the hardcopy thesis submission. If the thesis is judged unacceptable for defense, then the time period allotted for the defense will be used by the examining board, the candidate’s supervisor and the Graduate
Chair to recommend a course of action, which they will then discuss with the candidate. Please see the Graduate Thesis Regulations Section 8.4 for the appropriate timelines for resubmission. A new defense, normally with the same examining board, will be scheduled when the resubmitted thesis is in hand. The candidate will be given the opportunity to defend the resubmitted thesis at an oral examination. The decision, by majority vote of the examiners, on the acceptability of the thesis content and the decision on the oral defense are then final. A resubmitted thesis found to be unacceptable cannot be revised and submitted a third time.

5) The oral examination shall consist of:
   a) A brief introduction of the candidate's work. This involves a 15 to 20 minute oral presentation by the student. The student is responsible for ensuring that all necessary equipment is booked and functional for their presentation.
   b) Questioning on the subject of the thesis, and/or pertinent topics arising from the thesis by the board of examiners.

6) The acceptability of the oral defense of the thesis shall be determined by a majority vote of the examiners present at the examination. If the thesis is acceptable, but the oral examination is unsatisfactory, a second oral examination (preferably with the same examining board) shall be scheduled no earlier than 30 days from the original defense.

7) The acceptability of the form of the thesis shall be determined by a majority vote of the examiners. If the content is acceptable, but the form is unacceptable, the candidate shall be advised in what respects the thesis is deficient. The examiners must be satisfied with any amendments or changes being recommended. Normally the supervisor withholds his/her signature from the Certificate of Examination Form until all recommended changes have been completed.

8) The candidate's Supervisor(s) must attend the examination but may not answer questions during the rounds of questioning, except under rare circumstances and at the invitation of the chair of the board of examiners. Visitors may attend at the discretion of the chair.

9) The decision to recommend the awarding or withholding of the degree shall be rendered at the conclusion of the examination, by the board of examiners, following discussion by the board and the candidate's supervisor, but in the absence of the candidate.

<table>
<thead>
<tr>
<th>MASTER’S THESIS DEFENSE TIMELINE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seven weeks prior to examination date</strong></td>
</tr>
<tr>
<td><strong>Six weeks prior to examination date</strong></td>
</tr>
<tr>
<td><strong>Five weeks prior to examination date</strong></td>
</tr>
<tr>
<td><strong>Four weeks prior to examination date</strong></td>
</tr>
<tr>
<td>Time Frame</td>
</tr>
<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td>Three weeks prior to examination date</td>
</tr>
<tr>
<td>Three days prior to examination date</td>
</tr>
</tbody>
</table>

For SGPS term deadlines for submission of a Master’s thesis, please see the following link: [https://grad.uwo.ca/current_students/thesis/timelines.html](https://grad.uwo.ca/current_students/thesis/timelines.html)

Please review the SGPS website below for details on the electronic thesis preparation process, formatting, etc.
[https://grad.uwo.ca/current_students/thesis/index.html](https://grad.uwo.ca/current_students/thesis/index.html)

For information on the thesis regulations, please see the following:
[https://grad.uwo.ca/current_students/regulations/8.html](https://grad.uwo.ca/current_students/regulations/8.html)

The rule of thumb for revisions to be completed is two weeks, however, the School of Graduate and Postdoctoral Studies allows up to six weeks. You are only considered to have completed your degree after you have uploaded your final approved thesis to Scholarship@Western and submitted your signed Certificate of Examination form.
B. Ph.D. Thesis in Biology

Please refer to the School of Graduate and Postdoctoral Studies website, section 8.4.2.1 for information on the Doctoral thesis regulations as they pertain to the examination committee composition, etc. on the following website:

https://grad.uwo.ca/current_students/regulations/8.html

For information on the thesis formatting, electronic submission, etc. please see the following site:
https://grad.uwo.ca/current_students/thesis/index.html

Briefly, the Ph.D. thesis defense consists of a 45 to 50 minute public lecture, followed by a closed door oral exam.

<table>
<thead>
<tr>
<th>DOCTORAL THESIS DEFENSE TIMELINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nine weeks prior to examination date</td>
</tr>
<tr>
<td>Eight weeks prior to examination date</td>
</tr>
<tr>
<td>Seven weeks prior to examination date</td>
</tr>
<tr>
<td>Six weeks prior to examination date</td>
</tr>
<tr>
<td>Five weeks prior to examination date</td>
</tr>
<tr>
<td>One week prior to examination date</td>
</tr>
</tbody>
</table>

For SGPS term deadlines for submission of a Doctoral thesis, please see the following link: http://grad.uwo.ca/current_students/doctoral_thesis_timeline.htm

Please review the SGPS website below for details on the thesis preparation guidelines.
http://grad.uwo.ca/current_students/thesis_regulation_guide.htm

The rule of thumb for revisions to be completed is two weeks, however, the School of Graduate and Postdoctoral Studies allows up to six weeks. You are only considered to have completed your degree after you have submitted your final revised thesis via Scholarship@Western and provided the School of Graduate and Postdoctoral Studies with the signed Certificate of Examination.
Composition of Doctoral Thesis Examination Committee:
Examiners for a Doctoral Thesis Defense are selected based on their research expertise rather than by stream. For details on Doctoral Thesis examiner roles and requirements, refer to section 8.4.2.1 in http://grad.uwo.ca/current_students/regulations/8.html

1. Program examiner: One Biology faculty member (may be an advisor)
2. Program examiner: A second Biology faculty member (not an advisor)
3. University examiner: One UWO faculty member from outside of Biology (not adjunct, cross-appointed in Biology nor an advisor)
4. External examiner: One faculty member from an outside educational institution

For students in the Collaborative Program in Environment & Sustainability the following applies:
1. Program examiner: One Biology faculty member (may be an advisor)
2. Program examiner: A second Biology faculty member (not an advisor)
3. University examiner: It is recommended but not required that the University examiner be a faculty member who is associated with the Centre for Environment and Sustainability, is from outside of Biology (not an adjunct or cross-appointed to Biology), and is not an advisor. If this is not possible, the University examiner must be a UWO faculty member from outside of Biology (cannot be adjunct or cross-appointed in Biology), and cannot be an advisor.
4. External examiner: One faculty member from an outside educational institution

Program and University examiners must have membership through the School of Graduate and Postdoctoral Studies.

The School of Graduate and Postdoctoral Studies discourages students from being in contact with Doctoral thesis defense examiners, in particular the external examiner. The supervisor is to communicate with the examiners.
7. COLLABORATIVE PROGRAMS

A. Environment & Sustainability (Thesis-Based)
For further information, contact Holly Sanderson (hsanders@uwo.ca), Program Administrator for the Centre for Environment & Sustainability.

The Collaborative Program in E&S is an enrichment program for current graduate students (M.Sc. or Ph.D.) who are currently enrolled in home programs in faculties across campus and whose research intersects with matters concerning the environment and sustainability. Hosted by Western’s Centre for Environment & Sustainability, this program provides an exciting opportunity for graduate students to gain valuable exposure to current research projects in other fields, and to engage with peers to gain perspective on the different guiding principles that other researchers use in their fields of investigation. The Collaborative Program in E&S is for students who wish to broaden their graduate school experience, gain a greater understanding of the scope and complexity of environment and sustainability issues, or become specialists in specific aspects of environment and sustainability. Biology students enrolled in the program will graduate with a collaborative degree: Biology with Environment & Sustainability.

The Collaborative Program in E&S was designed with three goals in mind:
- to build upon and complement the discipline-based programs relevant to environment and sustainability;
- to promote an appreciation of the interdisciplinary nature of environmental problems; and
- to develop a community of students and faculty across Western who are interested in environment and sustainability.

M.Sc.
- Biology 9100 Graduate Research in Biology
  Part 1 required
  Part 2 replaced with EnvrSust 9410Y
  Part 3 required
- One additional course (0.5 credits) in Biology (or related field) at the graduate level
- Plus 1.5 course credits in E&S (these courses cannot include those used to meet the 0.5 course credit in Biology; this includes EnvrSust 9410Y for 0.5 credits).

Ph.D.
- Biology 9150 Graduate Research in Biology
  Part 1 required
  Part 2 replaced with EnvrSust 9420Y
  Part 3 required
  Part 4 required
- Three additional courses (1.5 credits) in Biology (or related field) at the graduate level
- Plus 1.5 course credits in E&S (these courses cannot include those used to meet the 1.5 course credits in Biology; this includes EnvrSust 9420Y for 0.5 credits).
Although Biology students who register in the Collaborative Program in E&S are formally excused from Part 2 of Biology 9100 (M.Sc.) or 9150 (Ph.D.), they are encouraged to participate in the seminar series offered by their chosen Stream in Biology.

B. Developmental Biology
Coordinator: Dr. Dean Betts (dean.betts@schulich.uwo.ca).

Developmental Biology is the study of how organisms develop from a single cell zygote to a mature organism. Students who have been accepted into the Biology Graduate program have the opportunity through the Collaborative Developmental Biology to work with a number of Developmental Biologists around campus – for details see http://www.devbio.uwo.ca/.

The purpose of the Collaborative Graduate Program in Developmental Biology is to create a community of graduate students with an interest in Developmental Biology and to provide specific courses to support and teach that community. Our aim is to train Developmental Biologists who will go on to make significant contributions to the field. We currently have funding as an Interdisciplinary Development Initiative and this has allowed us to provide external speakers for courses and for student performance incentives.

M.Sc.
- Biology 9100 Graduate Research in Biology
  Part 1 replaced with Developmental Biology 9000 (DEV9000)
  Part 2 replaced with Developmental Biology 9000 (DEV9000)
  Part 3 required
- DEV9000 Topics in Developmental Biology
- One additional half course in Biology (or related field) at the graduate level

Ph.D.
- Biology 9150 Graduate Research in Biology
  Part 1 replaced with Developmental Biology 9000 (DEV9000)
  Part 2 replaced with Developmental Biology 9000 (DEV9000)
  Part 3 required
  Part 4 required
- DEV9000 Topics in Developmental Biology
- DEV9100 Current Trends in Developmental Biology
- Two additional half courses in Biology (or related field) at the graduate level