



**Department of Microbiology and Immunology**

# **Graduate Student Handbook**

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## INTRODUCTION

The Faculty of Graduate Studies sets the rules for graduate students to follow at Dalhousie University. These rules are found in the [Dalhousie University Graduate Calendar](#), available online and from the Faculty of Graduate Studies Office (3rd Floor, Arts and Administration Building) or at the [Faculty of Graduate Studies](#). The information contained in this booklet is designed to help students understand the rules, regulations and procedures pertaining to graduate studies in the Department of Microbiology & Immunology.

In addition this booklet will provide graduate students and faculty with a description of specific procedures and degree requirements for graduate study in Microbiology & Immunology at Dalhousie University. Unusual situations may require some individual modifications to be made through discussions with supervisors and supervisory committees. Any modifications will be subject to approval by the Department.

The Department provides support and counseling for graduate students through a standing committee of the department, the Graduate Studies Committee. Students are welcome to contact the Graduate Coordinator, or the Associate Coordinator. There is also administrative support provided by the Graduate Secretary, who students can contact for advice and clarification of these terms.

*It is the responsibility of each student to familiarize themselves with the Faculty of Graduate Studies Regulations each year. The procedures outlined herein will apply to all graduate students registering for the first time. They will continue to apply in subsequent years. Any further revisions will apply only to students whose programs start after the date of the revision.*

## GRADUATE PROGRAM

### PROGRAM OVERVIEW

The graduate program is designed to provide students with the foundation to excel in a competitive research environment. Graduate training is first and foremost a research degree. Students are expected to aggressively pursue an independent research project that provides the foundation for their graduate thesis.

### REGISTRATION

**Registration Note: The Registrar's Office entertains admission with January, May, September start dates. ALL** graduate students must register **ANNUALLY** online.

Students must register for the appropriate thesis course (MICI 9000 for MSc students and MICI 9530 for PhD students) prior to the commencement of the term. Each new student must also register for MICI 5400 – Host Pathogen Interactions and Human Disease. Each graduate student is required to register for one of three Journal Clubs, depending on their area of research. The three courses are MICI 5001 – Cancer Biology Seminars, MICI 5006 – Topics in Advanced Immunology and MICI 5007 – Advanced Topics in Molecular Pathogenesis.

## TYPES OF GRADUATE CLASSES

There are two types of graduate classes:

1. [MICI 5003](#), [MICI 5027](#), [MICI 5038](#), [MICI 5100](#), , [MICI 5114](#), [MICI 5116](#), [MICI 5118](#), [MICI 5302](#), [MICI 5601](#), [MICI 5602](#); these are advanced-level half-credit (single semester) classes; each is intended to help the student gain a wide understanding in one of the major areas of microbiology, immunology or related subjects. Any one or more of these classes may be mandatory in an individual student's program. Note that classes below the 5000 level cannot be awarded credit as graduate classes (but may, nonetheless, be designated as mandatory).
2. [MICI 5001](#), [MICI 5006](#), [MICI 5007](#) – Mentioned above, these are full-credit classes, which use a journal club format and are designed to provide interactive instruction in specific areas, respectively. All graduate students in Microbiology & Immunology are required to take one of these courses for the duration of their program. The courses are designed to increase the expertise and confidence of the student in oral presentation and discussion as well as to explore some especially interesting areas of current research that may not be directly related to their thesis research.

## CLASS REQUIREMENTS

Graduate students are required to register for one of the journal club courses [MICI 5001](#), [MICI 5006](#) or [MICI 5007](#). Also, all students are required to participate in weekly departmental seminars. New graduate students are required to take MICI 5400 – Host Pathogen Interaction and Human Disease. Credits for advanced classes in a graduate program are applied toward the student's degree provided such credits have not already been counted towards another degree. Class requirements are determined by consultation between the student and the supervisory committee and must be approved by the departmental Graduate Studies Committee.

In addition to these general requirements, all PhD candidates are required to pass a comprehensive examination consisting of both written and oral components.

## FAILURE IN A CLASS

**Any grade below B- (<70%) is a failing grade for students registered in a graduate program.** It is a Faculty of Graduate Studies regulation that a student who fails **ANY** class is automatically withdrawn (academically dismissed) from their program of study. However, if a failure is limited to one half-class and if a grade of C- (56%) or better has been obtained, the Department, at a meeting of its faculty, will consider all aspects of any individual case and may, at its discretion, recommend to the Dean of the Faculty that the student be readmitted.

## **GRADING SYSTEM and GPA**

The standard graduate grading scale is outlined here. Please note that alternate grading scales may apply in certain courses. Any alternate scales will be outlined in the course syllabus.

### **Letter Grade Grade**

A+	90>
A	85-89
A-	80-84
B+	77-79
B	73-76
B-	70-72
FM	67-69
F	<67

## **FGS PROGRESS REPORTS**

Every graduate student in the second year and beyond of a thesis program is required to submit an [Annual Progress Report](#) to the Faculty of Graduate Studies. This form requires signatures from their supervisor(s) and the Graduate Coordinator.

The report is due on an annual basis, **one month prior** to the anniversary of the student's admission date, e.g. due August 01 for September admits, December 01 for January admits, and 01 April for May admits. Students are reminded faculty may be absent during the summer months and are encouraged to submit the August report early.

If you hold an NSERC PGSM/D you must complete an [Annual Progress Report](#) one month in advance of the anniversary date of the start of your award. If the progress report is not received by the posted deadline it may result in the award being terminated or a delay in the renewal of the award.

## **MSc TO PhD TRANSFERS**

Students who wish to transfer from the MSc program to the PhD program are required to prepare a PhD research proposal (details below). Ideally, students should apply to transfer to the PhD program by the 12th month and generally no later than the 16th month after initial registration.

Due to deadlines set by the Registrar, students should note that transfers only become effective on May 1, September 1 or January 1. Students should also note that transfer from the MSc to PhD program after the first full year will alter their fee status (from thesis-only fee back to full fee) and will only make them eligible for an FGS scholarship starting the following September. Further explanation can be obtained from the Graduate Secretary. Students should also check with the Faculty of Graduate Studies Office regarding the fee payment schedule for their program.

Students intending to transfer to the PhD program usually make their intentions known to their supervisory committee during one of the two scheduled committee meetings that occur each year during the student's program. The supervisory committee assesses the student's progress and development, provides their recommendation on the student's suitability for the PhD program, and sets a tentative meeting date for submission of the PhD proposal. The recruitment of an additional committee member to satisfy the committee requirements for a PhD student (i.e. supervisor, co-supervisor [if required] and three additional faculty members) should occur prior to submission of the research proposal. Following this meeting the committee must submit a signed PhD Thesis Proposal form to the Graduate Secretary **NOTE: the student should ensure that this entire process is coordinated with the Graduate Secretary.**

### **PhD RESEARCH PROPOSAL**

Students who directly entered the PhD program and those students transferring from the MSc to PhD programs must submit a PhD research proposal to their committee. For students who directly entered into the PhD program, their proposal should be completed before the end of their first year in the program.

Writing a research proposal that will form the basis of a student's directed research is an important step towards focusing one's efforts and resources on a particular problem and devising appropriate strategies for its solution. The skills of "grantsmanship" necessary for writing a successful research proposal are important in establishing scientific credibility and in attracting interest (i.e. funding) in one's work. In the course of graduate student training, demonstration of these skills is also an important early indicator of academic development. The proposal, in the format of an NSERC-type grant application, should outline the proposed research project. Students are encouraged to seek advice from their supervisor, supervisory committee members (and others) during the preparation of their research proposal.

For detailed information on the required format of the proposal, please refer to the document, [PhD Proposal Guidelines](#).

Following submission of the research proposal, the student delivers an oral presentation of their proposal to the committee. During this meeting, while providing advice and feedback to the student, the committee reviews and evaluates the feasibility of the proposal and the student's ability to carry out the proposed work.

The committee then makes a recommendation of acceptance, modification or rejection.

## **RESIDENCY PERIOD**

All graduate programs are normally completed within five years from initial registration. The following sets out residency requirements for each program offered:

<b>DEGREE</b>	<b>RESIDENCY</b>	<b>MINIMUM ADMISSION REQUIREMENTS</b>
MSc	2 years	General BSc (3 yr. program), including 4 senior undergraduate classes in the discipline* with B+ or better average.
MSc	1 year	Honours BSc, including 4 senior undergraduate classes in the discipline, or equivalent pre-Masters classes from another university.
PhD	3 years	Honours BSc or MSc in the discipline
PhD	2 years	MSc in the discipline or transfer after 1 year in Masters program

\*Discipline is meant to include all classes pertinent to Microbiology & Immunology. This includes certain classes in Biochemistry, Pathology, and Biology. The majority of these are listed for the Honours BSc program in Microbiology & Immunology (see the Undergraduate Calendar). A class is normally the equivalent of one-half credit.

Residency requirement is the number of years for which full tuition fees are charged. The MSc is usually completed in 2-3 years while the PhD normally takes 4-5 years.

Graduate students have a maximum period of time within which to complete all the requirements of their graduate degree. The maximum period for MSc is 5 years and for PhD is 6 years.

## **GRADUATE STUDIES COMMITTEE (GSC)**

The GSC is an appointed committee of the Department (and includes a graduate student representative) with the following primary responsibilities:

1. to recommend to the FGS which students should be admitted to graduate programs in the Department;
2. to recommend stipends for graduate students;
3. to administer placement and qualifying examinations as required;
4. to monitor the progress of graduate students. The GSC will ensure that each graduate student fulfils the requirements of the Faculty and of the Department. To this end, the Graduate Secretary will maintain records of all graduate students. The GSC will report to the Department at departmental meetings.

## **SUPERVISION**

### **GUIDELINES ON THE SUPERVISION OF GRADUATE STUDENTS**

#### **I. Responsibilities of Supervisors**

1. to be reasonably accessible to the graduate student and to be available for consultation at relatively short notice;
2. to help design a viable research project;
3. to provide resources adequate for the successful completion of said project;
4. to regularly monitor and provide advice regarding research progress;
5. to assist in the resolution of technical problems, either personally or by identifying appropriate resource personnel;
6. to advise and if necessary assist in the timely production of research publications;
7. to provide advice and detailed feedback both before and after oral presentations;
8. to encourage (and if possible assist) students to present their findings at scientific meetings;
9. to help students make personal contacts with experts in their field;
10. to continue supervision when on leave, possibly with arrangements also being made for members of the students supervisory committee to assist the student for the leave period;
11. to advise and help the student to approach other faculty members for assistance with specific problems or even to request the reading of a chapter or section of the thesis.

#### **II. Responsibilities of Students**

1. to participate in the design of a viable research project;
2. to provide the intellectual input required to implement and carry through same;
3. to accept and act upon all reasonable advice provided by the student's supervisor or Supervisory Committee;
4. to develop expertise and dexterity in the use of relevant lab techniques;
5. to contribute to the provision of common lab resources;
6. to seek assistance in the event that deficiencies with communication skills are identified;
7. to prepare and thoroughly practice oral presentations well in advance, and to seek experienced feedback in so doing;
8. to produce thesis drafts, if requested, in timely fashion, and to act upon suggestions provided by the supervisor or supervisory committee.

Graduate students are expected to be present and working in the laboratory every day of the work week with the exception of time spent in class (if the class is part of their program). Students are entitled to a two week vacation annually with dates chosen in consultation with their supervisor.

NB: It should be noted that the thesis represents your work and you are ultimately responsible for its intellectual content and production. This includes writing, typing, artwork, photocopying and binding costs; some costs may be defrayed by your supervisor at his/her discretion.



### **III. Rights of Supervisors**

1. to expect you to respond positively to advice and to all reasonable requests;
2. to expect you to exhibit reasonable and timely progress in all aspects of your work;
3. to expect you to contribute harmoniously to the common good of the lab;
4. to terminate supervision and advise you to find another supervisor if you do not heed advice and ignore recommendations for changes in the thesis, or if you are not making a reasonable effort;
5. to have your thesis supervision properly credited by the Department as an intrinsic part of their workload so that, in the assignment of duties, they are not overburdened to the point of having their effectiveness as a supervisor impaired;
6. to have you acknowledge, by footnoting, all portions of their own research over which they want to retain future rights of authorship;
7. to have you agree to give permission for the results of their research to be used for the benefit of a larger project when you are working as an assistant with your supervisor on research that is part of such a project, always with the understanding that you will retain scholarly credit for your own work.

### **IV. Rights of Students**

1. to have a clear understanding of what is expected at all times from all of your supervisory committee members and the Department;
2. to expect assistance/advice/feedback from your supervisory committee in all relevant matters;
3. to receive a fair assessment of the completed thesis and explanation of negative criticism;
4. resources permitting, to present results at one or more scientific meetings;
5. to be represented on all appropriate Department Committees;
6. to be permitted to change supervisors when you can offer convincing reasons to the Department ;
7. to be protected from exploitation by your supervisor or other faculty members if the latter should:
  - o intrude upon your rights of authorship or
  - o constrain your research efforts for purposes not directly related to the advancement of the thesis project;
8. to submit a thesis even if your supervisor is not satisfied, although such action should be taken only in extreme cases and after full consultation with the Department.

### **RESEARCH SUPERVISOR**

Normally, graduate students will have made mutually acceptable arrangements with a faculty member for the supervision of their research before registering for their program at Dalhousie. Financial constraints may limit the choice of supervisor since all or part of the graduate student stipend may be drawn from the supervisor's research grant. As soon as possible after registration, but within the first two months of the program, the supervisor, with the student's input, if desired, will nominate a supervisory committee. The membership of the committee is subject to approval by the GSC. From time to time students will have both a supervisor and co-supervisor.

## **SUPERVISORY COMMITTEES**

The course of study of every graduate student in the Department is approved by the student's supervisory committee. If changes are required, the student should consult with the supervisor and the Graduate Coordinator. This committee also forms most of the examining committee which recommends to the Department (and hence to the Faculty) when a student has satisfactorily fulfilled all requirements for the MSc or PhD degree. Students should feel free to utilize the expertise of their committee members. Supervisory Committee meetings normally take place at six month intervals in the fall and spring of each academic year. However, graduate students are encouraged to call committee meetings whenever they feel it is necessary.

## **COMMITTEES FOR MSc CANDIDATES**

A minimum supervisory committee comprises the student's research supervisor and two other faculty members, at least one of whom should be a faculty member of the Department. Students with co-supervisors will have a four member committee.

## **COMMITTEES FOR PhD CANDIDATES**

These comprise:

- the student's research supervisor
- three other members, at least one of whom should be a faculty member of the Department
- with co-supervision, there will be 5 members of the supervisory committee

## **DUTIES OF SUPERVISORY COMMITTEES**

- to meet with the student and to discuss a program of study in light of the student's background
- to meet at least twice a year with the student to review and discuss progress
- to be available for consultation as requested by the student
- to form the nucleus of examining committees

## **SUPERVISORY PROGRESS REPORTS**

One week before a supervisory committee meeting, the student should complete and submit Part A of the Progress Report Form (along with any additional information) to each member of the committee and to the Graduate Coordinator outlining the student's research progress. At the time of the meeting, the student will discuss current progress, future research directions, and any technical difficulties and will entertain comments and questions from committee members.

A committee member other than the supervisor will chair the meeting and complete Part B of the form. Once signatures are obtained the completed Progress Report (Part A & B) is copied to each committee member and submitted to the Graduate Secretary for filing in the student's file.

## **COMPREHENSIVE EXAM**

### **COMPREHENSIVE EXAMINATION**

The purpose of the Comprehensive Examination is to evaluate the doctoral candidate's overall knowledge of relevant subject matter, to challenge the candidate's ability to critically evaluate the literature, and to assess their ability to effectively communicate and discuss scientific concepts both in written and oral formats. The skills thereby attained by students in the preparation for and performance of the Comprehensive Examination mark an important level of accomplishment in their scientific training. The ability to consolidate knowledge and prepare critical summaries in a timely manner is an essential skill for the successful preparation of manuscripts and grant proposals, which graduate students, as new scientists, will encounter increasingly during their careers. In addition, successful completion of the Comprehensive Examination ensures that the candidate possesses the background knowledge and reasoning skills necessary for the Doctoral Thesis Defense.

#### **Preparation for the Comprehensive Examination**

Candidates are expected to exhibit a general knowledge of microbiology and immunology (2nd year undergraduate level as covered in MICI 2100), advanced knowledge (3rd to 4th year undergraduate level) in their general discipline (as defined by the candidate's supervisory committee), and detailed knowledge on the written essay topics. The student and supervisory committee should define the candidate's general discipline within the first year of the student's PhD program, based on the focus of the student's PhD research (e.g. bacterial pathogenesis, immunity and inflammation, vaccinology, cancer cell biology, molecular virology, etc). Since candidates can expect the acquisition and maintenance of advanced knowledge in their discipline will be a continuous process, they are strongly advised to begin reviewing their general and advanced knowledge in preparation for the Comprehensive Examination immediately upon entering the doctoral program. Weekly attendance and periodic presentations at Departmental Seminars and Journal Clubs, as well as regular reading of relevant scientific literature, is essential!

#### **Timing of the Comprehensive Examination**

The comprehensive exam should take place no later than 28 months after initial registration in the PhD program (36 months after original registration for students who register for MSc and switch to PhD), and after completion of all required coursework.

#### **Examination Committee**

The Examination Committee consists of the candidate's supervisory committee (usually comprising three faculty members plus the supervisor [and co-supervisor if the candidate is jointly supervised]) and one additional member to be chosen by the supervisory committee. The Graduate Coordinator or Associate Graduate Coordinator will act as Chair of the Examination Committee. The Chair is responsible for ensuring that the Departmental Comprehensive Examination process is uniformly applied to all candidates.

### **Written Comprehensive Examination**

The Examination Committee will meet six weeks prior to the Comprehensive Exam to set three essay questions. These questions should deal with topics that are related, but peripheral, to the student's own research project. In many cases the topics are designed to strengthen the candidate's knowledge in an area of weakness or one that the supervisory committee deems to be especially important. Essay topics are generally fairly broad, covering an important area in the general discipline. The candidate will receive the three essay questions five weeks prior to the examination date. The candidate will choose **two** essay topics and has three weeks in total to prepare a written paper for each. Copies of these papers are provided to all members of the examination committee **two weeks** prior to the oral exam.

Candidates are encouraged to consult with Examination Committee members regarding the form, content, and expectations of the written papers. To facilitate this process, the identity of primary and secondary readers for each topic will be indicated to the candidate at the time the topics are received. Candidates are also encouraged to refer to Comprehensive Examination essays done by former students, available in the Departmental Library. It is also useful to consult graduate students who have recently passed the Comprehensive Examination for advice.

Criteria for essays: As a guideline for length, each paper should be approximately twenty, double-spaced pages (excluding figures and references). The paper should provide an overview of the literature, citing relevant current primary literature in addition to reviews and historical references. The papers should provide a **synthesis**, not just a recitation, of the literature and include **critical analysis**, challenges and opportunities, questions still to be addressed, future directions and approaches, etc. (i.e. where is the field currently and where is it going). Simply recounting a body of facts without providing any original input is not satisfactory. Proofreading the paper for **clarity** and grammatical correctness is important!

### **Oral Comprehensive Examination**

The candidate will be examined orally by the Examination Committee two weeks after submission of the written papers. The Examination Committee will meet *in camera* before the exam commences to assess the quality of the written papers. If the written papers are not judged suitable for examination, the Chair of the Examination Committee will notify the candidate with the Committee's recommendation for remedial action. Otherwise, the Committee will proceed to the oral examination, which will generally last approximately two hours. The examination will stress lateral thinking, as well as factual knowledge related to the essay topics.

It is important that equal emphasis be placed on the examination of each essay. Generally, the assigned primary or secondary reader for each essay initiates a line of questioning, and other members of the Examination Committee then join in. The candidate's level of knowledge in their general discipline will be assessed by all members of the Examination Committee during the course of questioning. Candidates are advised to expect some questions relating to the examination question which the candidate did not choose to answer.

When answering questions from the Examination Committee, candidates are advised to begin with the basics and then develop the answer to a more advanced level of knowledge. Examination Committee members may interrupt an answer if the candidate clearly has a detailed

knowledge of the subject matter, since one purpose of the examination is to identify apparent deficiencies in the candidate's knowledge.

### **Assessment and Outcomes**

At the end of the examination, the Examination Committee will meet *in camera* to deliberate and reach a consensus decision. Students must perform satisfactorily in all components of the Comprehensive Examination. The Chair of the Examination Committee will inform the candidate of the committee's decision and recommendations, and will provide the candidate with feedback on strengths and weaknesses. In cases where the candidate's overall performance is satisfactory but some significant knowledge deficiencies are identified, the Examination Committee will assign the candidate a "Pass with Program Requirement" and recommend appropriate remedial action, which may include (but is not restricted to):

1. Assignment as a Demonstrator in an appropriate undergraduate class or classes
2. Complete additional undergraduate course-work with a grade of B+ or better
3. Complete a graduate-level Independent Studies class with a grade of B+ or better
4. Present additional papers at Journal Club
5. Complete another essay in the area that needs strengthening

If the performance of the candidate in the oral exam is judged to be unsatisfactory, the candidate *will* be permitted to re-take the oral component of the Comprehensive Examination at a date not later than six months following the first attempt. The Chair of the Comprehensive Examination Committee *will* advise the candidate regarding the Committee members' requirements for satisfactory performance in the re-examination.

Failures to perform satisfactorily (pass or pass with program requirement) during the second attempt at the Comprehensive Examination will result in academic withdrawal from the PhD program, and may result in dismissal from the graduate program.

## **MSc & PhD THESIS**

### **Preparation of Graduate Theses**

All graduate theses, whether for Master's or Doctoral degrees, must be completed according to the formal [Faculty of Graduate Studies regulations](#) for thesis preparation and submission. All thesis students must review these regulations; students are responsible for ensuring their theses comply with all aspects of these regulations. Failure to do so may cause delays in completion, and may even result in the cancellation of a scheduled defense or examination.

### **Dalhousie Thesis Guidelines**

Dalhousie University recognizes two formats for thesis submission, Master's or Doctoral: Standard Format and Publication Format.

## Standard Format

The Department of Microbiology & Immunology guidelines for the Standard Format thesis are the same as those of the Faculty of [Graduate Studies' Thesis Format Guidelines](#)

## Publication Format

The Department of Microbiology & Immunology requirements for the Publication Format exceed the standards of the Faculty of Graduate Studies and must be adhered to.

A. Requirements: A student may opt to submit their thesis as a series of related papers (manuscripts intended for publication) that form a coherent body of work. This option requires prior consent of the supervisory committee and appropriate copyright permission.

The Department of Microbiology & Immunology requires that a student be lead author of at least two manuscripts (published, accepted, or submitted for publication) in order to use the Publication Format. Additional data generated by the student and presented in other co-authored publications (including co-first author papers) can also be integrated into the thesis. The student's contribution to both the research and the writing of any multi-authored paper must be clearly specified at the beginning of each relevant chapter. The Student Contributions to Manuscripts in Theses Form is found with [Forms and Documents: Theses and Defences](#) and should be filled out by the supervisor and submitted with the thesis.

### B. Format:

(a) General - The papers will normally form one or more well defined thesis chapters. The publication status (submitted, in revision, in press, or published, with dates) and book or journal details (volume, page numbers, etc.) of any manuscripts or papers included in the thesis must be specified with each such chapter. The publication or acceptance of such manuscripts before the thesis defense in no way supersedes the examination committee's evaluation of the work, including requesting revisions. Publications incorporated as thesis chapters should be in manuscript form in a style consistent with general FGS guidelines. Linking sections between manuscript chapters may be included as necessary. Where publication abstracts or acknowledgements are included, they should appear as sections or subsections that are numbered in accordance with the rest of the chapter text.

Just as the academic content of the thesis must reflect the student's own work, so must the standard of writing and expression. It is expected that the student must have contributed substantially to the writing of the manuscripts. The examining committee may require students to either modify or rewrite the thesis in Standard Format if the quality of the writing style differs significantly between the manuscript chapters and the general introduction and discussion.

b) Introduction: Although manuscript chapters will normally have their own introduction, there should be a single general introductory chapter at the beginning of the thesis that provides a comprehensive review of the relevant literature. The Introduction should also tie together the individual manuscript chapters into a coherent story, and should include clear rationales,

objectives and/or hypotheses to provide a framework for the entire thesis.

c) Materials and Methods: This section should be presented in a single chapter and should be detailed enough to permit a rigorous assessment of the approaches without the need to consult other publications (i.e. usually more comprehensive than those commonly found in publications).

d) Results: In addition to the results presented in the manuscripts, additional results generated by the student but not presented in the manuscripts are frequently included to complete or extend the studies. Supplemental data from the manuscripts published only on-line should generally be included in the relevant chapter of the thesis. The term “data not shown” should be kept to an absolute minimum. Data not generated by the student, but which is essential to the flow of thesis, may be included in the thesis but should be kept to a minimum and must be clearly identified as such in the relevant figure legends and attributed to the contributor.

e) Discussion: in addition to the discussions in the manuscript chapters, there should be a single comprehensive discussion chapter at the end of the thesis. This chapter ties together the different manuscript chapters of the thesis and clearly indicates how the student’s graduate research has advanced the field. The Discussion provides students with the opportunity to step outside the restrictive boundaries of journal publications to include more forward-looking statements and speculation than commonly found in published papers.

f) References: All references cited in publication-format chapters must be included in a single complete reference list at the end of the thesis. The citation style should be consistent throughout the thesis.

g) Supplementary Material: Supplementary material (e.g. extensive data tables) may appear as supplements to publication-format chapters, as separate chapters, or as appendices, depending on the nature and length of the additional material required. However, most supplementary data figures should usually be integrated into the thesis.

h) Copyright Permission: Students must obtain appropriate copyright permission for any substantial part of the thesis for which copyright is held by another party (e.g. a publisher). Permission letters are included in an appendix at the end of the thesis. Letters must include provision for LAC (NLC) reproduction (<http://dalgrad.dal.ca/currentstudents/thesesanddefences/forms/>).

i) Reprints: Reprints may be included in the appendices. Copyright permission is required.

## **TITLE OF THESIS**

The title of the PhD thesis, indicative of subject matter, must be submitted to the Dean of Graduate Studies for Faculty approval **no later than six months** before the expected final thesis examination. This is the responsibility of the student and their supervisor.

## **THESIS SUBMISSION**

Unbound copies of an MSc or PhD thesis must be presented to the student's supervisory committee for final approval. Any thesis presented in bound form will be rejected automatically. The student's attention is drawn to the other thesis requirements in the [Dalhousie Graduate Calendar](#). The Faculty of Graduate Studies Office has information available on the preparation of theses, [Common Thesis Format Review Comments](#) and students are **strongly advised** to read these before reaching the final stages of [thesis writing](#). In addition, the thesis format must be approved by Graduate Studies BEFORE it is submitted to the committee members. For MSc candidates, a copy of the MSc Thesis Approval form (available from the Graduate Secretary), signed by the supervisor and the student should be given to the secretary and unbound copies of the thesis must be given to members of the Examination Committee no later than two weeks prior to the Defence.

For the PhD candidate, two forms The [PhD Examination Information Form](#) and the [Thesis Submission Form](#) (completed and signed by all committee members) together with the candidate's CV and an unbound copy of the thesis must be submitted to the Faculty of Graduate Studies at least four weeks prior to the thesis defence date.

## **THESIS DEFENCE**

Each MSc and PhD candidate will make a public oral presentation of their work for not *more than 20 minutes*. Thereafter questions will be asked by the examining committee. The departmental office will arrange and publicize the MSc defence; PhD defences are arranged and publicized by the Faculty of Graduate Studies. Both are done in consultation with the research supervisor and the student. The MSc defence will be chaired by the Graduate Coordinator, Associate Graduate Coordinator or designate, and the PhD defence by a member of the Panel of PhD Defence Chairs.

## **EXAMINATION COMMITTEE**

- MSc: Supervisor (and co-supervisor, if applicable), two committee members and one additional faculty member. Chaired by the Graduate Coordinator or designate.
- PhD: Supervisor (and co-supervisor, if applicable), at least two committee members plus an external examiner (external to the University) and the departmental representative. Chaired by a member of the Panel of PhD Defense Chairs.
- The external examiner is chosen by the student's supervisory committee. The supervisor then informs the Departmental Chair who then advises the Faculty of Graduate Studies through the submission of the "[Request to Arrange Oral Defence of a Doctoral Thesis](#)" form. The Faculty of Graduate Studies extends the formal invitation to the external examiner.



## SEMINARS

### SEMINARS

All graduate students are expected to present the results of their research in the weekly Department seminar series. First year students will present a talk in the Grad Student Symposium usually held in late January or early February.

Students in the MSc program will normally give 2 seminars (one each academic year). Students in the PhD program or who switch from the MSc to the PhD program are required to give 3 seminars in total (one each year for the first two years and the third at the student's discretion).

First-year graduate students will present a short (~10 minutes with 3-4 minutes for questions) seminar in the Grad Student Symposium usually held in late January or early February. This presentation provides the audience with an overview of the general research area (what has been done, what is being done, what is going to be done and why it is important). The review may include previous data from research conducted by the student's supervisor and from other laboratories. The student's own research project should then be outlined relative to the "larger picture" painted from the overview of the field. The objectives of the research, the approaches to be used and the expected significance of the results should be detailed. Students receive written comments and suggestions from the audience following the symposium.

Senior graduate students should present a seminar approximately 45 minutes in length with appropriate visual support. This will focus on the progress in their research project and include experimental results, conclusions, and models.

The function of these seminars is to involve the entire department in a student's research project and to permit the student to gain experience in one important format of oral communication. Prior rehearsal of the seminar with the supervisor or supervisory committee (strongly recommended), post-seminar debriefing (with the seminar coordinator and supervisory committee), and use of standard evaluation forms distributed to a few selected members of the audience (faculty and students) will help the student to benefit from this experience.

These seminars should be well-planned, formal presentations and these presentations should be developed so that a **general science audience** can understand and appreciate the material presented. The content should be appropriate for a graduate level with relevant, current data from the literature used to support general statements. As with any presentation, effective use of well-prepared visual aids is a necessity (slides, overheads, blackboard).

The student's final presentation to the Department (in their thesis year) should be on their research (accomplishments, significance, future implications). This is a good opportunity for the student to practice a formal, "job interview"-type seminar with slides.

## **JOURNAL CLUB**

### **JOURNAL CLUB PARTICIPATION**

Students are required to register and participate throughout their program in one of three journal clubs: either Cancer Biology Seminars (MICI 5001), Topics in Advanced Immunology (MICI 5006) or Advanced Topics in Molecular Pathogenesis (MICI 5007). This journal club participation is in addition to the regular Monday departmental seminar.

Journal Club courses are a program requirement in the Department of Microbiology & Immunology. Students are expected to attend all sessions of the Journal Club in which they are registered. If attendance falls below 80%, the student and supervisor may be contacted. Students who anticipate an extended absence should consult with their supervisor and contact their Journal Club course organizer. Students writing their comprehensive exams may use their own discretion regarding attendance. Writing up a thesis is not a valid excuse for missing Journal Club.

## **FUNDING**

### **STIPENDS**

All students accepted into the graduate program receive at least the minimum stipend specified by the Department (\$17,850, based on the CIHR scale) regardless of the source of their funding. In addition to the basic stipend, students are also eligible for an additional \$2,000 to \$4,000 to partially defray the cost of full program fees (1 year for MSc, 2 years for PhD). The Department is committed to the continued support of graduate students who are progressing satisfactorily through their programs. The Department will do all in its power to maintain secure stipend support for the duration of their programs.

### **SUPPORT FOR TRAVEL**

Every graduate student registered at Dalhousie University is eligible to apply for support for research travel from the Faculty of Graduate Studies, e.g., to conferences. At present this support is up to \$400 (effective August 15, 2011), once per program. [FGS Conference Travel Grant](#) forms **must be submitted no later than one month before the conference and require the Department Head's signature.**

NB: The student must be planning to present a poster or a paper at the conference to qualify for support. Students are required to have either a letter confirming acceptance or a copy of the conference program including the title of the poster/presentation, the date and location of the conference.

### **Dalhousie Association of Graduate Students Travel Grants Program**

DAGS provides \$100 travel grants to graduate students who are not eligible for an FGS travel grant. [Applications](#) are available online.

### Eligibility

- a. Travel Grants may only be awarded to DAGS Members paying DAGS fees. All Microbiology & Immunology graduate students are a member of DAGS.
- b. Travel Grants may only be awarded if the applicant has already applied for a Faculty of Graduate Studies travel grant, or in the case they are ineligible.
- c. The applicant must be attending a conference relating to his or her program of study.
- d. Applications will not be accepted retroactively or for conferences that will occur after graduation.
- e. No DAGS Member may receive more than one grant in any fiscal year.

## DEADLINES

### Progress Reports

The Faculty of Graduate Studies [Annual Progress Report](#) is due on an annual basis, **one month prior to the anniversary of the student's admission date**. This means they are due **August 01 for September** admissions, **December 01 for January** admissions, and **01 April for May** admissions. Due to likely summer absences, of both faculty and students, reports due in August can be submitted any time after the first of May.

## IMPORTANT DEADLINES FOR MSc STUDENTS

### First Fall Term

- attend any relevant safety meetings and/or courses (e.g., WHIMS, radiation safety, laboratory animal care and handling, biosafety)
- in consultation with supervisor, arrange for a supervisory committee within the first two months of the program
- submit signed program form
- register online for all three terms for REGN 9999 (for stipend), MICI 5400, Journal Club and any required courses

### Each Fall

- register online for all three terms for REGN 9999 (for stipend), Journal Club and any required courses

### When the Thesis is Nearly Complete

- consult FGS for current thesis format regulations, and ensure that your thesis conforms to these regulations
- consult with supervisory committee and Department Chair to find a suitable time for the MSc final exam (allow at least three hours, to give time for presentation, examination and deliberation)
- request the Graduate Secretary reserve an appropriate room for the defence

- provide the particulars of the defence (date, time, place, list of examiners, copy of the Abstract) to the Graduate Secretary so that a Notice for the defence can be prepared
- complete "Intent to Graduate" through Dal Online or using [paper form](#)

### **When the Thesis is Complete**

- present one unbound copy of the thesis to each member of the supervisory committee and one unbound copy to the Department Chair two weeks prior to the scheduled defence
- notify the Graduate Coordinator that the thesis has been submitted
- **students are responsible for arranging for any audiovisual equipment that is needed for their defence through Medical Computing and Media Services at 494-1290.**

### **After the Defence**

- it is the student's responsibility to make recommended changes to the thesis. When this is complete and the final thesis has been approved by their Committee, the student [submits their thesis online in PDF/A](#) format and takes the signed signature page to the Faculty of Graduate Studies Office.
- Students are responsible for having their thesis bound and with providing their supervisor(s) and the department with a bound copy.

## **IMPORTANT DEADLINES FOR PhD STUDENTS**

### **First Fall Term**

- attend any relevant safety meetings and/or courses (e.g., WHIMS, radiation safety, laboratory animal care and handling)
- in consultation with supervisor, arrange for a supervisory committee within the first two months of the program
- submit signed program form
- register online for all three terms for REGN 9999 (for stipend), MICI 5400, Journal Club and any required courses

### **Each Fall**

- register online for all three terms for REGN 9999 (for stipend), Journal Club and any required courses

### **Six Months before the Thesis is to be Submitted**

- register the proposed title of the thesis with FGS

### **Three to Six Months before Submission of the Thesis**

- call a meeting of the supervisory committee to discuss possible external examiners (student may or may not be present for this discussion, depending in committee's wishes)
- remind the supervisor to submit the "[Request to Arrange the Oral defence of a Doctoral Thesis](#)"
- complete "Intention to Graduate" through Dal Online or using [paper form](#)

### **When the Thesis is Nearly Complete**

- present an unbound copy to each member of the supervisory committee and one unbound copy to the Graduate Coordinator or Graduate Secretary
- present one unbound copy of the thesis (the External Examiner's copy) to FGS, along with the [PhD Examination Information Form](#) and the [PhD Thesis Submission Form](#) This form should be signed by each member of the supervisory committee; it is important to keep in mind that the external examiner must be allowed **at least four weeks** to read the thesis before it can be examined
- notify the Graduate Coordinator that the thesis has been submitted
- provide the suggested particulars of the defence (date, time, place, list of examiners, copy of the Abstract) to the department Graduate Secretary - she will notify graduate studies who will then do the Notice for the Defence
- **If the room for the defence is not equipped with a data projector and computer the student is responsible for arranging to borrow any equipment from the department.**

### **After the Defence**

- it is the student's responsibility to make recommended changes to the thesis. When this is complete and the final thesis has been approved by the committee, the student [submits their thesis online in PDF/A](#) format and takes the signed signature page to the Faculty of Graduate Studies Office.
- Students are responsible for having their thesis bound and with providing their supervisor(s) and the department with a bound copy.

## **REGULATIONS**

### **AUTHORSHIP ON PUBLICATIONS**

*"At the beginning of the graduate student's program, the supervisor is expected to make clear to the graduate student what the requirements are for authorship on any publication."* An author is "one who made a substantial contribution to the ideas, overall design, execution and data analysis pertinent to the experiments". Graduate students have intellectual ownership of any thesis-related material and are therefore authors on any publications arising from their thesis research. All authors are responsible for the entire paper and must agree to the order in which their names are listed. Individuals who provided assistance, e.g., supplied strains or reagents or critiques of the paper need not be listed as authors.

## **GRIEVANCE/APPEALS PROCEDURES**

Faculty and departmental decisions are subject to the normal appeals procedures which begin with the Department, School or College and are then forwarded to the Dean for approval. Faculty and University regulations take precedence and cannot be overturned by an appeal at a lower level.

If still unresolved, the student may appeal to the Faculty of Graduate Studies Appeals Committee.

The grounds for appeal are limited to the following:

1. procedural unfairness
2. bias, or
3. irregularity in procedure or marking

Students appealing to the Faculty must provide the following documents:

1. a letter of circumstance describing the problem and what you would like to happen
2. a letter from the class instructor (if appropriate)
3. a letter from the Graduate Coordinator/Chair of the department
4. in a case of illness, a letter from a doctor indicating
  - o when the illness was diagnosed
  - o what effect the illness has on the student's class performance
  - o assessment of student's ability to complete the class requirements ever, and
  - o what special aids are required, if any

Decisions of the Appeals Committee are forwarded to the Dean for approval. Students may appeal the final Faculty decision to the Senate.

## **CONTACT INFORMATION**

Dr. Brent Johnston – Graduate Coordinator, Tupper Building – Room 11K  
[brent.johnston@dal.ca](mailto:brent.johnston@dal.ca)

Dr. Roy Duncan – Associate Graduate Coordinator, Tupper Building - Room 7R  
494-6770 or [roy.duncan@dal.ca](mailto:roy.duncan@dal.ca)

Susan White - Graduate Secretary, Tupper Building - Room 7-C4  
494-3562 or [susan.white@dal.ca](mailto:susan.white@dal.ca)

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