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# Department of Biomedical Sciences

## Graduate Student Handbook

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### Contents

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<b>INTRODUCTION</b> .....	<b>3</b>
<b>SAFETY AND TRAINING</b> .....	<b>3</b>
<b>RIGHTS AND RESPONSIBILITIES</b> .....	<b>4</b>
<b>ADDITIONAL SOURCES OF INFORMATION</b> .....	<b>4</b>
<b>ADVISORY COMMITTEES, COMMITTEE MEETINGS, AND EVALUATION REPORTS..</b>	<b>4</b>
<b>TIME TO COMPLETION OF THE GRADUATE PROGRAM</b> .....	<b>5</b>
<b>DEGREE REGULATIONS AND EXPECTATIONS</b> .....	<b>5</b>
ADMISSION REQUIREMENTS.....	5
DEGREE REQUIREMENTS.....	6
SEMINAR REQUIREMENTS.....	8
TIMING OF SEMINARS .....	8
FORMAT OF SEMINARS .....	9
SCHEDULING AND ATTENDANCE AT SEMINARS.....	9
SEMINAR AWARDS.....	10
<b>ADVISORY COMMITTEE</b> .....	<b>10</b>
<b>MSC THESIS</b> .....	<b>11</b>
TIME TO COMPLETION .....	11
PROCEDURES.....	11
MSC EXAMINATION .....	13
COPIES OF THESIS .....	13
PUBLICATION .....	13
<b>PHD QUALIFYING EXAMINATION</b> .....	<b>14</b>
QUALIFYING EXAMINATION COMMITTEE.....	15
QUALIFYING EXAMINATION PROPOSAL .....	15
EVALUATION OF THE QUALIFYING EXAMINATION .....	16
ROLE OF THE STUDENT .....	16
ROLE OF THE ADVISOR .....	17
ROLE OF THE ADVISORY COMMITTEE .....	17
ROLE OF THE EXAMINATION COMMITTEE.....	17
<b>PHD THESES</b> .....	<b>18</b>
TIME TO COMPLETION .....	18

PROCEDURES.....	19
EXTERNAL EXAMINER .....	19
PHD FINAL EXAMINATION (THESIS DEFENCE) .....	20
COPIES OF THESIS.....	21
PUBLICATION .....	21
<b>DEPARTMENTAL ACTIVITIES.....</b>	<b>22</b>
ACCESS TO DEPARTMENT KEYS .....	22
DEPARTMENTAL SEMINARS.....	22
ATTENDANCE AT QUALIFYING EXAMINATIONS AND THESIS DEFENCES .....	22
PUBLICATION .....	22
<b>FINANCIAL SUPPORT .....</b>	<b>24</b>
STIPENDS.....	24
TRAVEL.....	24
GRADUATE TEACHING ASSISTANTSHIPS (GTA).....	24
OVC AWARDS .....	24
EXTERNAL AWARDS .....	24
<b>GRADUATE STUDENT REPRESENTATIVE ROLES .....</b>	<b>25</b>
GRADUATE STUDENT ASSOCIATION (GSA) EXECUTIVE COUNCIL.....	25
GRADUATE STUDENT ASSOCIATION (GSA) BIOMEDICAL SCIENCE GENERAL DIRECTORS .....	25
GRADUATE STUDENT REPRESENTATIVE.....	25
<b>USEFUL REFERENCES.....</b>	<b>26</b>

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This handbook is designed to be a quick reference to important university regulations and as a guideline for information specific to the Department of Biomedical Sciences. Regulations are indicated in the Graduate Calendar, but some programs have additional departmental requirements as outlined in this document. In addition, graduate students are responsible for being familiar with:

- University regulations regarding graduate studies and programs are described in the Graduate Calendar.
- University policies on scientific integrity and ethical principles of research, including regulations concerning use of animals, human subjects, radioactive materials, biohazards, laboratory safety, and client confidentiality.

## Introduction

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The Department of Biomedical Sciences specializes in scientific disciplines which are basic to human and veterinary medicine. Within this context, the research activities of the faculty are focused under the general umbrella of biomedical science and biotechnology. The MBS, MSc and PhD programs provide emphasis in one of the department's major fields of research: Reproductive Biology, Cardiovascular Physiology, Cellular and Molecular Basis of Health and Disease, Cancer Biology, Pharmacology & Toxicology, Regenerative Medicine and Stem Cell Biology, and Neuroscience. The department also participates in the Doctor of Veterinary Science (DVSc) program, the Biophysics MSc/ PhD interdepartmental program and the Neuroscience MA/MBS/MSc/PhD and Toxicology MSc/ PhD collaborative programs.

## Safety and Training

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- All graduate students are required to take Workplace Hazardous Materials Information System (WHMIS) training.
- All students must have a laboratory orientation by their Advisor and sign a form indicating that they have done so.
- Environment Health and Safety provides information and training in Biosafety, Hazardous Materials Management, Hazardous Waste Management, Radiation Safety and Health Physics, etc.
- Animal Care Services provides information and training on use of animals in research and teaching. If you are engaged in research involving animals, you are **required** to take the Animal User Training Program. For more information please consult <http://www.uoguelph.ca/research/acs/teaching/teaching.shtml>
- **Important: you must have training and certification, before working with animals, biohazards, or radioactive material.**
- The University of Guelph Centre for International Programs (CIP) has developed a **Safe International Travel Policy**. This policy **applies to any activity undertaken outside of Canada** (including the US) by University students and employees in connection with their academic work or other activities official organized under the auspices of the University. These activities include scholarly conferences and exchange programs.

Please consult <https://www.uoguelph.ca/cip/guelph-students-preparing-study-and-travel-abroad/safe-travel-information>

- All students traveling outside of Canada on a program in connection with their academic work, research or other activity officially organized under the auspices of the University of Guelph (including scholarly conferences) **must complete a pre-departure orientation**. Please see <https://www.uoguelph.ca/cip/guelph-students-preparing-study-and-travel-abroad/pre-departure-orientation>

## Rights and Responsibilities

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- The rights and responsibilities of graduate students, Advisors, and Advisory Committees as well as mechanisms for dispute resolutions are outlined in considerable detail in the [Graduate Calendar](#). Please see <https://www.uoguelph.ca/registrar/calendars/graduate/current/>
- Frequent communication is a key to ensure optimal progress. Discuss any concerns you have with your Advisor and Advisory Committee, or with the Graduate Coordinator if the student feels their concerns are not being addressed.
- It is extremely important that all students understand what is meant by plagiarism and other forms of academic misconduct. For more information please consult <http://www.academicintegrity.uoguelph.ca/plagiarism.cfm>. Additional information is available from <http://www.academicintegrity.uoguelph.ca/>

## Additional sources of information

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- [Admissions And Progress Committee: Procedures & Guidelines](#)
- [Graduate Program Coordinator's Handbook](#)
- [A variety of forms from the Office of Graduate and Postdoctoral Studies](#)
- [Thesis/examination information](#)
- [Courses offered by the Department of Biomedical Sciences](#)
- [Graduate Awards and Financial Assistance](#)
- [Human Rights and Equity Office](#)
- [Student Health Services](#)
- [Student Housing](#)
- [Graduate Student's Association](#)

## Advisory Committees, committee meetings, and evaluation reports

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All students must have an Advisory Committee that is recruited by the Advisor in consultation with the student. The composition of the Advisory Committee is listed in the Graduate Calendar, and is detailed below for each graduate program. This committee, together with the student, will arrange a program of study (i.e., list of courses).

The **Advisory Committee Appointment Form** submitted by the Graduate Program Assistant to the Office of Graduate and Postdoctoral Studies (OGPS) no later than the **20<sup>th</sup> class day of the student's second registered semester**, or registration for the subsequent semester may be blocked by the Office of Graduate and Postdoctoral Studies.

The **Graduate Degree Program Form** outlines the student's graduate program including required courses, and **must be submitted before end of the student's second registered semester**. An amended form must be completed if the program or required courses are changed.

A **Graduate Student Evaluation Report** must be submitted to the Graduate Assistant by the **20<sup>th</sup> class day of the student's second semester**. Once the Advisor has completed their summary of the Advisory meeting, the student will receive a copy of the report and add their own comments if they wish. It is not necessary for graduate students to add comments, unless they wish to do so. A copy of the signed report goes to the Departmental Graduate Secretary (Christina Voll) and if there are concerns, to the Office of Graduate and Postdoctoral Studies.

An **Advisory Committee meeting** is *recommended each semester*. Normally, students should provide a report of progress to the Advisory Committee, in advance of each meeting. Progress and future requirements can be summarized using the optional form.

## **Time to completion of the graduate program**

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The normal time to completion of the program and the maximum program duration is regulated by the Office of Graduate and Postdoctoral Studies and is outlined in the Graduate Calendar (see “**Program durations for graduate students**”, Table 1). Students who exceed the completion period are required to complete a **Graduate Student Plan Of Study**, which must be approved by each member of the Advisory Committee, the Graduate Program Coordinator, and the Admissions and Progress Committee.

## **Degree Regulations and Expectations**

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### **Admission requirements**

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Admission requirements are described in the Graduate Calendar, including **general University regulations** as well as requirements specific for the Department.

**For admissions into the MBS or MSc programs**, applicants should have an Honours baccalaureate degree in the Biological Sciences or a Doctor of Veterinary Medicine degree (or the equivalent) with a minimum 'B+' standing in the final two years of study. Letters of reference from two individuals who can adequately evaluate the academic and research capabilities of the applicant must be provided with the application. In addition, a short statement of the applicant's research interests and career goals, is required to assist in the selection of faculty Advisors. Students may be admitted into the Fall, Winter or Summer semester. Provisional acceptance may be granted to students who do not meet this 'B+' standard if there is additional evidence that the applicant is capable of successfully completing the graduate program (e.g., outstanding letters of recommendation, or evidence of prior relevant work or research experience). Transfer to regular status will normally be recommended when the student obtains a minimum grade of 'A-' in their

first two graduate course and displays current research ability to his/her Advisory Committee. These courses will be credited to the degree program.

**For admission into the PhD program**, applicants must show evidence of potential for independent, productive and original research. Admission to the PhD program generally requires completion of an MSc program with a research component, a minimum 'B+' average in the prescribed courses taken during the master's degree program, and strong recommendations from referees who have a sound knowledge of the student's strengths and weaknesses. In addition, a short statement of the applicant's research interests and career goals is required. In exceptional cases, where a candidate has demonstrated excellence in academic work and extraordinary ability to plan and initiate original research, transfer to the PhD program without completion of the MSc program may be recommended. This transfer must take place before the end of the fourth semester in accordance with university regulations. In all cases, students who do not hold an approved research-based MSc degree must register as MSc students regardless of their ultimate goals. Students may be admitted into the Fall, Winter or Summer semester. In those cases where the student is continuing her or his MSc research program into the PhD program, the student must clearly explain how the PhD research program represents a significant advance over that of the MSc.

### Degree requirements

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**Students in the MBS program** must obtain at least an overall weighted average of 'B-' in prescribed courses. The MBS program is a course-based degree with a research component (designated as BIOM\*6900). The number of course credits prescribed will not be fewer than 4.0 credits (a 1.0 credit for BIOM\*6900 is included in the total required credits of 4.0). Selection of courses outside of BIOM\*6900 will depend on the student's prior experience and the nature of the research project.

**BIOM\*6900 is a required course exclusive to MBS students.** A grade for this course consists of the following:

- (1) NSERC-style Discovery Grant (without budget) (worth 30%, due in the middle of second month of semester 2);
- (2) poster presentation of their research to date as part of the annual OVC Student Leadership and Training (SLRP) symposium scheduled (worth 15%, presented in mid-August);
- (3) revised research paper summarizing the research findings (worth 40%, due the middle of the last month of semester 3);
- (4) faculty Advisor's assessment of performance in the lab (worth 15%) (see MBS organization chart).

The MBS Program is completed when all aspects of the required coursework, including BIOM\*6900, have been deemed appropriate by the Student's Advisory Committee.

Students enrolled in the MBS program may start in the Fall, Winter or Summer semesters. Depending what semester student start the program, the due date for various components of BIOM\*6900 (except for the poster presentation) will vary (see MBS organization chart).

MBS Program organization chart:

Fall		Winter		Summer	
month	task	month	task	month	task
September		January		May	
October		February		June	
November		March		July	
December		April		August	<b>Poster presentation (August 14-15<sup>th</sup>)</b>
January		May		September	
February	NSERC Grant (due mid-month)	June	NSERC Grant (due mid-month)	October	NSERC Grant (due mid-month)
March		July		November	
April		August	<b>Poster presentation (due mid-month)</b>	December	
May	BIOM*6900	September	BIOM*6900	January	BIOM*6900
June	BIOM*6900	October	BIOM*6900	February	BIOM*6900
July	BIOM*6900	November	BIOM*6900	March	BIOM*6900
August	<b>Poster presentation (due mid-month);</b> BIOM*6900 paper (due August 20 <sup>th</sup> )	December	BIOM*6900 paper (due December 18 <sup>th</sup> )	April	BIOM*6900 paper (due April 18 <sup>th</sup> )

**Students in the MSc program** Students must obtain at least an overall weighted average of 'B-' in prescribed courses. The MSc program is a thesis-based degree with a minimum course requirement of 1.5 credits. Prescribed and additional courses are selected by the student in consultation with the student's Advisory Committee. The courses selected will depend on the student's prior experience and the nature of the research project. The student must also prepare and defend an acceptable thesis and meet the Department's minimum scientific communication requirement. **The minimum scientific communication requirement is one conference presentation (oral or poster) at a suitable Regional, National or International scientific conference.** If this requirement has not been achieved, written justification must be provided to the Department of Biomedical Sciences Graduate Program Committee outlining the reasons why these requirements have not been achieved. The Chair of the Department of Biomedical Sciences Graduate Program Committee will provide a written response outlining the decision of the Graduate Program Committee to either grant or reject the request that the defence proceed even though the minimum scientific communication requirement has not been completed. All students are required to present two departmental seminars during their program. The thesis research proposal, developed by the student in consultation with the Advisor, must receive approval from the Advisory Committee no later than the end of the second semester of the program. The program is completed by the successful oral defence of a written thesis.

**Students in the PhD program** are expected to demonstrate the originality and skill needed to contribute to the knowledge base in a manner that transcends the mere acquisition of data. The PhD program is a thesis-based degree with no minimum course requirements. If necessary, courses are selected by the student in consultation with the student's Advisory Committee. All students are required to present departmental seminars (one per annum). **Students must also successfully complete a Qualifying Examination.** Details of the Qualifying Examination which includes written and oral components can be found in the section below and on the Department's website (<http://www.ovc.uoguelph.ca/biom/graduate/>). Successful completion of the Qualifying Examination is a prerequisite for continuation in the PhD program. The Advisory Committee is

required to evaluate the student's research productivity periodically and to report on the student's progress to the Department Graduate Program Committee each semester in which the student is registered.

The PhD program culminates in the preparation, presentation and defence of the thesis, which contains a substantial component of original research. Preparation and defence of an acceptable thesis based on research data and hypotheses generated during the duration of the study are the main criteria used to assess the satisfactory completion of the PhD program. In addition the student must meet the Department's minimum scientific communication requirements. The **minimum scientific communication requirements are two manuscripts which must at least have been submitted to a scientific journal prior to the student graduating with their PhD degree.** One of these manuscripts must be based on the student's PhD research project and the student must be the first author on this manuscript. The second manuscript may be either an original research manuscript or a review manuscript. The student is not required to be the first author on this manuscript but the manuscript must be generated during the student's tenure as a PhD candidate (i.e. the manuscript cannot be based on work performed while an undergraduate student or work presented in an MSc thesis). Students transferring from the MSc program to the PhD program can use any publications generated while enrolled in the graduate program of the Department of Biomedical Sciences. If these requirements have not been achieved, written justification must be provided to the Department of Biomedical Sciences Graduate Program Committee outlining the reasons why these requirements have not been achieved. The Chair of the Department of Biomedical Sciences Graduate Program Committee will provide a written response outlining the decision of the Graduate Program Committee to either grant or reject the request that the defence proceed even though the minimum scientific communication requirements have not been completed.

### Seminar Requirements

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The ability of researchers to communicate their scientific ideas and data concisely and cohesively via oral presentations is a valuable and important skill. In order to facilitate the development of this skill, MSc and PhD/DVSc graduate students in the Department of Biomedical Sciences are required to present two (MSc level) or three (PhD or DVSc level) departmental research seminars during the course of their studies as part of their degree requirements. MBS students are not required to present research seminars but must instead present their research in poster format (see below). There are **no exceptions to this requirement.** Under special circumstances, and in consultation with the student's Advisor and Advisory Committee, students who transfer from an MSc program to a PhD or DVSc program may be required to give an additional (4th) seminar, should their course of study change as a result of the transfer.

### Timing of Seminars

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For the **MSc program**, the first seminar should be presented in the second or third semester. The second and final seminar should be completed by the end of the fifth semester, or at least three months before the intended date of thesis defense.



For the **PhD or DVSc programs**, the first seminar (typically the Qualifying Examination seminar) should be presented by the end of the third semester. The second seminar should be presented between the fifth and eighth semesters. The third and final seminar should be completed by the end of the eleventh semester, or at least three months before the intended date of thesis defense. All students and faculty Advisors are expected to adhere to these time guidelines (see <http://www.ovc.uoguelph.ca/biom/graduate/>).

### Format of Seminars

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All seminars should be 20-25 minutes in duration and should be presented using slides or computer-based presentation programs (e.g., PowerPoint Presentations). Slides should be clearly legible, with an appropriate balance between text, diagrams, and figures in order to enhance the audience's understanding of the topic being presented.

For the **MSc program**, the topic of both seminars should be directly related to the student's research project. The first seminar should be comprised of a fairly extensive review of the recent literature (majority of seminar), followed by presentation of the student's hypothesis, research objectives and scientific methods, as well as any preliminary data. The second seminar should briefly summarize the existing literature, reiterate the hypothesis/research objectives, and focus on the student's research findings and conclusions.

For the **PhD or DVSc programs**, the first seminar should be comprised of a fairly extensive review of the recent literature (majority of seminar), followed by presentation of the student's hypothesis, research objectives and scientific methods, as well as any preliminary data. The subsequent seminars should briefly summarize the existing literature, reiterate the hypothesis/research objectives, and focus on the student's research findings and conclusions.

### Scheduling and Attendance at Seminars

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Graduate student seminars are typically held on Weekdays (12:30 to 13:30), January-December. There may be two MSc seminars during a time slot (**12:30-1:00 and 1:00-1:30**), while PhD students have the option of booking both time slots and give a longer presentation (up to 40 min). Scheduling of these seminars is the responsibility of the graduate student, and their participation will be recorded by Department Chair and the Assistant to the Chair and Faculty. Each student is responsible for scheduling their own seminar in a timely fashion. Sign-up sheets are in the department administrative assistant's office. Students must provide their seminar title and preferred date of presentation.

Students, faculty and staff are **strongly encouraged** to attend as many seminars as possible in order to support their peers as well as to expand their knowledge of the broad research interests represented within the Department of Biomedical Sciences. Faculty and students will be asked to complete evaluation and comment forms which will be used to provide feedback to the presenter and to determine year-end seminar award winners.

### Seminar Awards

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Each calendar year (September-December), monetary awards will be presented for the best MSc (\$200) research seminar and the best PhD/DVSc (\$250) research seminar. The winners of the seminar awards will be determined via peer evaluation by using cumulative numerical rankings from the student evaluation forms and tabulated by the student Seminar Coordinator.

### Advisory Committee

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**Students in the MBS program** minimally require a **two (2) member Advisory Committee** (including the Advisor).

**Students in the MSc program** typically have a **three (3) member Advisory Committee** (including the Advisor). The minimum requirement for the Advisory Committee is two (2) members.

**Students in the PhD program** typically have a **4 member Advisory Committee** (including the Advisor), one of whom will be from outside the department. Minimally the Advisory Committee must include three members, one of whom will be from outside the department.

Advisory Committee members must be Regular members or Associated members of Graduate Faculty at the University of Guelph, or be nominated for this specific task as Special Graduate Faculty using the [Graduate Faculty Nomination Form](#).

## MSc Thesis

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For the MSc program each candidate shall submit a thesis, expressed in satisfactory literary form, based upon research in some topic connected with the candidate's special discipline. The thesis must demonstrate the candidate's capacity for original and independent work, and should include a critical evaluation of work which has previously been done in the candidate's field of research. The thesis should emphasize any new conclusions which may be drawn from the candidate's own research. For purposes of equivalency calculations, a master's thesis is generally considered to be the equivalent of 2.0 credits.

Should a student exceed the maximum program duration of nine semesters, they are to complete a revised Plan of Study in consultation with their Advisory Committee. If the advisory committee is unable to agree upon a Plan of Study, the Graduate Program Coordinator will provide a letter commenting on the Plan of Study originally provided by the student. Details regarding the Program Completion Period can be found in the [Graduate Calendar](#).

### Time to completion

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- Normal [completion period](#): 6 semesters
- Maximum program duration: 9 semesters

### Procedures

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The thesis may be submitted at any time of the year, but candidates are encouraged to have the final examination well in advance of the deadline date for thesis submission. Candidates should be aware of the deadlines schedule, a copy of which may be obtained in the Office of Graduate and Postdoctoral Studies. Candidates should discuss their thesis write-up with their Advisors early in their final semester. As the thesis is being written, the candidate is expected to be in regular communication with the Advisory Committee. The draft thesis is sent to the members of the Advisory Committee, who review the document and make a recommendation for examination.

Arrange the final examination with the Graduate Secretary, at least 4 weeks prior to the date of the examination.

1. The Advisory Committee reviews the thesis and completes the [Examination Request Form](#).
2. Following approval by the Advisory Committee, the thesis is then submitted to the Examination Committee. The Examination Committee requires at least 14 days (2 weeks) to review the document prior to the examination. It is acceptable for either the student or the Graduate Secretary to submit the thesis to members of the Examination Committee, but **the onus is on the student to make the appropriate arrangements**.

Candidates should note that preparation of the thesis usually takes longer than expected, and a calculator is available from the Office of Graduate and Postdoctoral Studies to estimate the time needed. As the thesis is being written, the candidate should be in regular communication with their Advisor and Advisory Committee, and consult the Graduate Calendar for [general regulations](#) and [formatting and submission requirements](#).

Following the MSc examination the candidate, if successful, arranges for the preparation of the thesis in final form, and for its submission to the Assistant VP (see below). The thesis in final form must include any minor corrections or revisions resulting from the examination. Approval of the thesis takes the form of a Certificate of Approval, signed by the examination committee.

## MSc Examination

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The final oral examination, devoted chiefly to the defence of the thesis, is a departmental examination identified as the MSc examination. The MSc Examination Committee normally consists of three or four members appointed by the Department Chair, as follows:

1. *Chair*, a member of the Graduate Program faculty (often a member of the Graduate Program Committee) not on the candidate's Advisory Committee;
2. A member of the candidate's Advisory Committee;
3. A member of the Graduate Program faculty not on the candidate's Advisory Committee;
4. *Advisor* or, if necessary, a member of the candidate's Advisory Committee.

It is strongly recommended that the Examination Committee include a Graduate Program faculty member from another department. All Examination Committee members must be Regular Graduate Faculty or Associated Graduate Faculty at the University of Guelph, or be nominated for this specific task as Special Graduate Faculty using the [Graduate Faculty Nomination Form](#).

The examination is open to the University Community; members of the audience are not permitted to ask questions.

The examination is passed and the thesis approved if there is no more than one negative vote. An abstention is regarded as a negative vote. The report to the Assistant VP of Graduate Studies will record the decision as unsatisfactory or satisfactory. If unsatisfactory, the candidate may be given a second attempt. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions).

## Copies of Thesis

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One electronic (.pdf) copy of the certified thesis must be submitted to the Atrium by the thesis submission deadline date shown in the Academic Schedule in the calendar. Also included in the electronic submission must be a brief abstract consisting of no more than 150 words. The Certificate of Approval signed by the examination committee, a copy of the circulation waiver, and the copying license must also be submitted to the Office of Graduate and Postdoctoral Studies. Departments may have a requirement to submit a bound copy of the thesis.

## Publication

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The university requires publication of the thesis in the following manner: One electronic copy of the thesis is uploaded by the National Library of Canada, and the agreement form signed by the candidate authorizing the National Library to publish the thesis and to make copies available for sale on request. The National Library will upload the thesis exactly as it is and will list the thesis in Theses Canada as a publication of the National Library. An abstract of not more than 150 words, prepared by the author and approved by the Advisor, and submitted as part of the electronic thesis submission, is also upload by the National Library. The National Library's Theses Non-Exclusive License will be sent to the candidate prior to the master's examination, to be signed and submitted to the Office of Graduate and Postdoctoral Studies immediately after the

successful completion of the examination. The candidate, in consultation with the Advisor and the department chair, shall have the right to request that circulation and/or copying of the thesis in any form be withheld for up to one year.

Students should consult with their Advisory Committee regarding the expected style and format of the thesis, as well as information provided by the Office of Graduate and Postdoctoral Studies. Since the thesis research (in part or in whole) should be published, it is advisable to write the thesis in chapters which correspond to a selected “journal format” if possible. The thesis still requires an Introduction, a detailed Review of the Literature, and a General Discussion. It is recommended that the references be collected into a single reference section and that citations be placed in the text. Particularly if the “paper format” is used for the thesis, particular attention should be paid to the attribution of work done by others. Such contributions should be clearly indicated in “A Declaration of Work Done” which should appear on the page immediately after the Abstract.

## **PhD Qualifying Examination**

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Students entering the PhD program after completing a MSc degree or transferring into the PhD program must attempt the Qualifying Examination before the end of the second semester as a Ph.D. candidate. If a student does not complete their first attempt of the Qualifying Examination by the end of the second semester, they will receive an unsatisfactory for their first attempt (see Evaluation of the Qualifying Examination).

In the event that the student is unsuccessful in their first attempt of the Qualifying Examination, the second attempt must be completed before the end of the third semester. If a student has transferred into the PhD program, they may apply to transfer back to the MSc program if they fail their first attempt of the Qualifying Examination. If the student is unsuccessful in their second qualifying attempt they must withdraw from the PhD program and they are ineligible to transfer back to the MSc program.

If there are special circumstances preventing a student from meeting these requirements, a letter from the Advisor describing the circumstances must be submitted to the Graduate Program Committee. The graduate program committee will then determine whether an extension is warranted.

As noted in the graduate calendar, during the Qualifying Examination "consideration is to be given not only to the student's knowledge of the subject matter and ability to integrate the material derived from his or her studies, but also to the student's ability and promise in research". The department expects that students will be:

- 1) Broadly familiar with /have a working knowledge of their field of study (effectively equivalent to a published literature review);
- 2) Able to discuss the specific details of their proposed research project;
- 3) Able to place and justify their own research project in the context of the larger field of study;

- 4) Able to recognize the strengths and limitations of the proposed experiments and methods, and be able to provide alternative strategies as necessary;
- 5) Have demonstrated evidence of ability, or the promise of ability, to successfully complete the proposed research - note, results are not a requirement of the Qualifying Examination

For Biomedical Sciences the Qualifying Examination includes a written proposal, a seminar to the department and an oral examination.

### Qualifying Examination Committee

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The Examination Committee consists of:

1. *Chair*, one of the Department Chair, Graduate Program Coordinator or designate;
2. Two Advisory Committee members (exclusive of the Advisor);
3. Two Graduate Faculty members who are not members of the student's Advisory Committee

It is strongly recommended that the Qualifying Examination Committee include a Graduate Program faculty member from another department; this individual may or may not be on the student's Advisory Committee. The Advisor does not participate as a member of the Examination Committee.

The Advisor can suggest Qualifying Examination Committee members. However, the Qualifying Examination Committee will be determined by the Department Chair or the Graduate Program Coordinator. The student's Advisor will not be a member of the Qualifying Examination Committee. The Advisor may be present during the examination and will be given the opportunity to make a statement at the end of the oral examination (after the student has left the room). **The Advisor will not participate in or be present during the examination committee's deliberations about the performance of the student.** If there are deficiencies noted by the Qualifying Examination Committee the Advisor will receive a letter outlining these deficiencies.

### Qualifying Examination Proposal

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The Qualifying Examination process is initiated by the student, who must submit a 1 page abstract of their intended proposal to their Advisory Committee. An abstract form is available on the Department of Biomedical Sciences website ([www.ovc.uoguelph.ca/biom/graduate/](http://www.ovc.uoguelph.ca/biom/graduate/)). This 1 page abstract will contain a brief background or rationale for the project, a hypothesis, specific aims/objectives, a brief description of the experimental plan and a significance statement. If the Advisory Committee approves the 1 page summary, the student will collect signatures from all committee members and then submit the signed summary page to the Department's Graduate Secretary. Once an abstract is approved, the student has 6 weeks to submit the full written proposal to their Advisory Committee (see flow chart).

The written proposal will be:

- A maximum of 20 double-spaced pages (not including references or figures).
- Each page will contain a maximum of 23 lines/page and a minimum font size of 12 points.
- Each page will have 1 inch margins.
- A maximum of 3 pages of appendices are permitted (can be used for figures, diagrams, etc.)

**Supervisory and Examination Committee members have the right to halt Qualifying Examination proceedings if proposals exceed the 20 double-spaced page limit.** The written proposal should include relevant background information (~8-10 pages of the proposal), hypothesis, objectives/aims, experimental plan, overall significance of the proposal and a brief timeline for completion of the proposed experiments. The experimental plan must provide enough detail that the examination committee can determine whether or not the student understands the proposed experiments. The experimental plan should also include appropriate controls for the proposed experiments, the number of experimental replicates, and statistical analysis that may be used.

### Evaluation of the Qualifying Examination

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Each component of the Qualifying Examination (written proposal, seminar and oral examination) will be evaluated by each Qualifying Examination Committee member. Each Qualifying Examination Committee member will provide a brief statement regarding the acceptability of the seminar, written proposal, and oral examination on the provided Qualifying Examination Evaluation Form.

The student passes the Qualifying Examination if no more than one member of the Qualifying Examination Committee votes unsatisfactory. An abstention is considered an unsatisfactory vote. If more than one member of the Qualifying Examination Committee votes unsatisfactory, then it is deemed that the student has failed the Qualifying Examination. The Qualifying Examination Committee will decide whether all or a portion of the written/oral examination should be repeated. The same Qualifying Examination Committee will conduct the second examination.

In the event that a student receives an unsatisfactory rating in their second attempt, the student must withdraw from the PhD program.

### Role of the Student

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The student will identify an appropriate research project with their Advisor. The intention of the Qualifying Examination is to evaluate the student's ability to identify a relevant, novel area of research, write a coherent research proposal and defend their proposal and ideas. With that in mind the student should receive minimal guidance from their Advisor or Advisory Committee. The student can, and is encouraged to, discuss their ideas and research approach with other graduates students and post-doctoral fellows in the department. The student should be prepared



to answer questions on their background knowledge of the topic and how their research proposal advances the current knowledge in their field. It is anticipated that approximately half of the questions during the oral exam will pertain to the student's general knowledge of the topic.

### Role of the Advisor

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The Advisor should guide the student towards an appropriate hypothesis, objectives and experimental approach. Since the Qualifying Examination is a measure of the student's ability to identify and defend a relevant research topic, guidance from the Advisor should be minimal.

After an appropriate research topic and approach has been identified the Advisory will have the same role as the Advisory Committee (see next section).

### Role of the Advisory Committee

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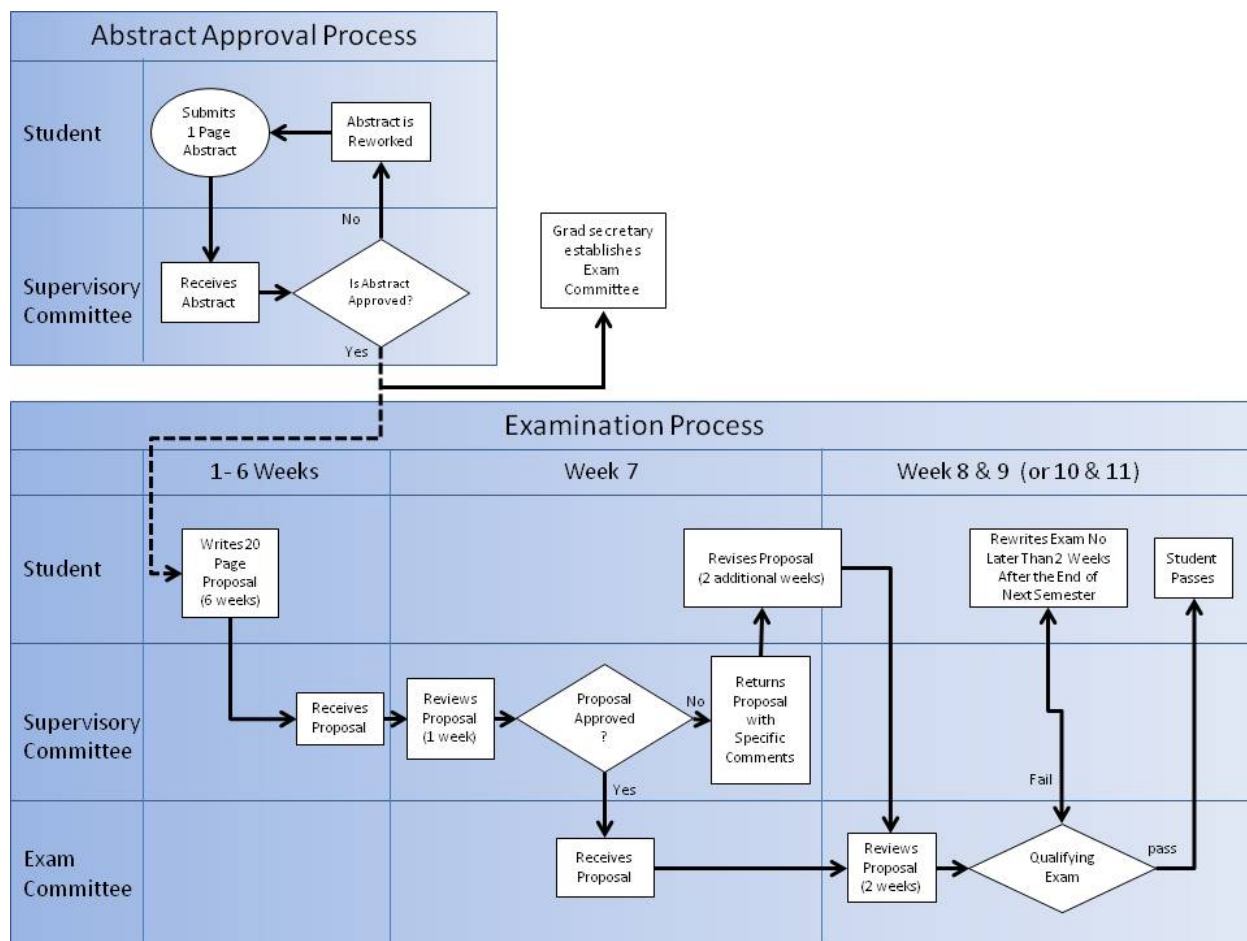
The Advisory Committee has two main roles. The first role is to determine whether the student has identified a relevant research topic with the appropriate objectives and experimental plan (this is based on the 1 page abstract). The student can hold an Advisory Committee meeting to provide committee members with more details about the objectives or experimental plan. This will be left up to student and the Advisory Committee. The second role of the Advisory Committee is to determine whether the student's final written report is suitable to proceed to the examination phase.

When evaluating the written report, **the Advisory Committee is not expected to provide detailed feedback unless the written report is unacceptable.** Unacceptable written reports include those which exceed the 20 double-spaced page limit. If the report is unacceptable, specific comments should be provided to the student so the student can address the weaknesses of the proposal. The student will have 2 weeks to revise the written proposal before it is sent to the examination committee. The Advisory Committee will not evaluate the revised version (unless they are a member of the examination committee). **If a re-write is necessary, the Qualifying Examination must be completed no later than 2 weeks after the end of the second semester** (see flow chart). Again, special circumstances preventing students from meeting this requirement will be considered by the Graduate Program Committee. The Advisor must provide the Graduate Program Committee with a letter outlining the special circumstances.

### Role of the Examination Committee

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It is anticipated that approximately half of the questions from the Qualifying Examination Committee will pertain to the student's general knowledge of the topic (i.e. background information of the proposal and how the proposal would advance our understanding of a particular topic).



## PhD Theses

Each candidate shall submit a thesis, written by the candidate, on the research carried out by the candidate on an approved topic. The thesis is expected to be a significant contribution to knowledge in its field and the candidate must indicate in what ways it is a contribution. The thesis must demonstrate mature scholarship and critical judgement on the part of the candidate and it must indicate an ability to express oneself in a satisfactory literary style. Approval of the thesis is taken to imply that it is judged to be sufficiently meritorious to warrant publication in reputable scholarly media in the field.

### Time to completion

- Normal **completion period**: 12 semesters for students with an MSc; 16 semesters for students entering directly from BSc/DVM program or transferring from an MSc program.
- Maximum program duration: 18 semesters for students with an MSc; 22 semesters for students entering directly from BSc/DVM program or transferring from an MSc program.

## Procedures

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The thesis may be submitted at any time of the year, but candidates are advised to allow ample time for revision and examination. A copy of the schedule of deadlines should be obtained from the Graduate Program Assistant by the candidate no later than the beginning of the semester in which the candidate intends to graduate. It is understood that, as the thesis is being written, the candidate will be in regular communication with the Advisory Committee. When a draft is completed which the Advisory Committee recommends for examination, the candidate, with the endorsement of the departmental chair, formally requests an examination. A copy of the final draft is then sent to the external examiner as fair copy of the thesis. Arrangements for the final oral examinations are made. It is understood that as a result of the final oral examination corrections may be necessary to produce a revised final draft of the thesis.

Arrange the final examination with the Graduate Secretary, as follows:

1. At least 8 weeks prior to the date of the Final Examination, complete the “Departmental Request for PhD Final Examination” form and the “Nomination of External Examiner” form (both are appended to this document).
2. The Advisory Committee reviews the thesis and completes the [Examination Request Form](#).
3. Following approval by the Advisory Committee, the thesis is then submitted to the Examination Committee. The Examination Committee requires at least 28 days (4 weeks) to review the document prior to the examination. **The student must submit the thesis to the Graduate Secretary, who forwards it to the external examiner.** It is important to avoid any contact between the student and the external examiner. It is acceptable for either the student or the Graduate Secretary to submit the thesis to other members of the Examination Committee, but **the onus is on the student to make the appropriate arrangements.**
4. Provide the candidate’s CV information to the Graduate Secretary, at least 3 weeks prior to the examination.
5. The Graduate Secretary completes the [Doctoral Final Examination Arrangements Form](#) at least 14 days prior to the date of the examination.

Candidates should note that preparation of the thesis usually takes longer than expected, and a calculator is available from the Office of Graduate and Postdoctoral Studies to estimate the time needed. As the thesis is being written, the candidate should be in regular communication with their Advisor and Advisory Committee, and consult the Graduate Calendar for [general regulations](#) and [formatting and submission requirements](#).

## External Examiner

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For each doctoral thesis an external examiner from outside the university is appointed on behalf of the Assistant VP of Graduate Studies by the department chair, in consultation with the Advisor. The external examiner must not have served as Advisor to the student’s Advisor, and must not have participated in joint projects with the Advisor. In addition, the external examiner must not have been a student or member of the graduate faculty at the University in the last five years. The nomination will be made when the candidate's Advisor declares that the thesis is about to be prepared, normally no later than the beginning of the student's last semester. The external examiner will submit a written appraisal of the thesis (at least seven days prior to the

examination) to the chair of the department who will then provide these comments to the candidate and the Advisory Committee. The external examiner is expected to participate in the final oral examination and to assist in evaluating all aspects of the candidate's performance. Any individual who serves as an External Examiner may not serve again until a period of 3 years has passed.

Please note: as of July 1, 2012 **the Office of Graduate and Postdoctoral Studies will no longer cover the cost of travel for External Examiners** but will continue to honor the \$200 honorarium. The University encourages departments to consider using SKYPE or video conferencing as a means of facilitating the participation of examiners from off-campus. OVC room LLC 1708 and PATH 4838 are equipped for video conferencing. The GPAs have access to laptops with video conferencing software available.

### PhD Final Examination (Thesis Defence)

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The Final Oral Examination is devoted chiefly, but not necessarily entirely, to the defence of the doctoral thesis. It is a faculty (as distinct from a departmental) examination, for which the arrangements are made by the department on behalf of the faculty in consultation with OGPS.

The Final Examination Committee includes the following members:

1. *Chair*, a member of the Graduate Program faculty (often a member of the Graduate Program Committee) not on the candidate's Advisory Committee, and typically from outside of the discipline area);
2. *External examiner*
  1. Note: any External Examiner deemed to have a conflict of interest with the Advisor, as defined in the [Graduate Calendar](#), is ineligible to serve. The External Examiner must not have been a student or member of the Graduate Faculty at the University in the last five years.
  2. Any individual who serves as an External Examiner may not serve again as an external examiner at the University of Guelph for a minimum period of 3 years. The Office of Graduate and Postdoctoral Studies has access to a list of ineligible external examiners.
  3. The Advisor nominates three External Examiners, using the Nomination of External Examiner Form attached.
3. A member of the candidate's Advisory Committee;
4. A member of the Graduate Program faculty not on the candidate's Advisory Committee;
5. *Advisor* or, if necessary, a member of the candidate's Advisory Committee.

It is strongly recommended that the Final Examination Committee include a Graduate Program faculty member from another department; this individual may or may not be on the student's Advisory Committee.

All members must be Regular Graduate Faculty or Associated Graduate Faculty at the University of Guelph, or be nominated for this specific task as Special Graduate Faculty using the [Graduate Faculty Nomination Form](#).

Note: the Final Oral Examination includes a minimum of two rounds of questions. The first round is open to all members of the University, but audience members are not permitted to question the candidate. All subsequent rounds of questions are closed and members of the audience are required to leave.

The members of the examination committee, including the External Examiner, report individually on the final examination and the thesis. The candidate is deemed to have passed if no more than one of the five examiners votes negatively. An abstention is regarded as a negative vote. Concurrently, the members sign the Certificate of Approval, which is submitted with the approved thesis in its final form to the Assistant VP Graduate Studies via the Office of Graduate and Postdoctoral Studies (see Submission of Thesis) where the decision of satisfactory or unsatisfactory will be recorded. If unsatisfactory, the candidate may be given a second attempt. A second unsatisfactory result constitutes a recommendation to the Board of Graduate Studies that the student be required to withdraw (see Unsatisfactory Progress and Appeals of Decisions).

### Copies of Thesis

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One electronic (.pdf) copy of the certified thesis must be submitted to the Atrium by the thesis submission deadline date shown in the Academic Schedule in the calendar. Also included in the electronic submission must be a copy of an abstract consisting of no more than 350 words. The Certificate of Approval signed by the external examiner and the members of the examination committee, a copy of the circulation waiver and the copying license must also be submitted to the Office of Graduate and Postdoctoral Studies. Departments may have a requirement to submit a bound copy of the thesis.

### Publication

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The Certificate of Approval indicates that the thesis is suitable for publication. The university requires publication of the thesis in the following manner: One electronic copy of the thesis is uploaded by the National Library of Canada, and the agreement form signed by the candidate authorizing the National Library to publish the thesis and to make copies available for sale on request. The National Library will upload the thesis exactly as it is and will list the thesis in Theses Canada as a publication of the National Library. An abstract of not more than 350 words, prepared by the author and approved by the Advisor and submitted as part of the electronic thesis submission, is also upload by the National Library. The National Library's Theses Non-Exclusive License will be sent to the candidate prior to the final oral examination, to be signed and submitted to the Office of Graduate and Postdoctoral Studies immediately after the successful completion of the examination.

The candidate, in consultation with the Advisor and the department chair, shall have the right to request that circulation and/or copying of the thesis in any form be withheld for up to one year. Publication in the above manner does not preclude publication of all or part of the thesis in journals or in book form.

Students should consult with their Advisory Committee regarding the expected style and format of the thesis, as well as information provided by the Office of Graduate and Postdoctoral Studies. Since the thesis research (in part or in whole) should be published, it is advisable to write the thesis in chapters which correspond to a selected “journal format” if possible. The thesis still requires an Introduction, a detailed Review of the Literature, and a General Discussion. It is

recommended that the references be collected into a single reference section and that citations be placed in the text. Particularly if the “paper format” is used for the thesis, particular attention should be paid to the attribution of work done by others. Such contributions should be clearly indicated in “A Declaration of Work Done” which should appear on the page immediately after the Abstract.

## Departmental activities

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### Access to Department Keys

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Students are required to pay a \$40 cash-only security deposit for any keys issued during the duration of their academic program. Students will be granted one replacement if they lose their key, but will be required to pay a second deposit if a key is lost twice. The security deposit will be returned once the student leaves the department.

### Departmental Seminars

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**Graduate students are expected to attend all if not the majority of Departmental seminars.**

### Attendance at Qualifying Examinations and thesis defences

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Qualifying Examination and Thesis Defence seminars are open to all members of the University. Students are encouraged to attend all Qualifying Examination and Thesis Defence seminars.

### Publication

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In addition to the preparation and defense of an acceptable thesis, MSc and PhD program students must also meet the Department’s minimum scientific communication requirement. The minimum scientific communication requirement **for MSc program students is one conference presentation (oral or poster)** at a suitable Regional, National or International scientific conference.

The minimum scientific communication requirements **for PhD program students are two manuscripts which must at least have been submitted to a scientific journal prior to the student graduating with their PhD degree.** One of these manuscripts must be based on the student’s PhD research project and the student must be the first or senior author on this manuscript. The second manuscript may be either an original research manuscript or a review manuscript. The student is not required to be the first author on this manuscript but the manuscript must be generated during the student’s tenure as a PhD candidate (i.e., the manuscript cannot be based on work performed while an undergraduate student or work presented in an MSc thesis). Students transferring from the MSc program to the PhD program can use any publications generated while enrolled in the graduate program of the Department of Biomedical Sciences.

If these minimum requirements are not achieved, written justification must be provided to the Department of Biomedical Sciences Graduate Program Committee outlining the reasons why. The Graduate Program Coordinator (or designate) will provide a written response outlining the

decision of the Graduate Program Committee to either grant or reject the request that the defence proceed in the absence of the minimum scientific communication requirement(s).

In all instances it is the student's responsibility to draft the paper or meeting abstract and to make certain that all coauthors have approved the contents before it is submitted.

## Financial support

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### Stipends

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MSc students are guaranteed support for 6 semesters and PhD students for 9 semesters. MBS students do not normally receive guaranteed support and are responsible for the full costs of the degree program. Support for longer periods is at the discretion of the Advisor and subject to the receipt of funds from sponsoring agencies. The minimum stipend for MSc and PhD students is \$17,500/year. Students are strongly encouraged to apply for external (e.g., NSERC, CIHR, OGS) and internal (e.g., OVC Scholarships) awards (see below).

### Travel

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MSc students are guaranteed up to **\$1,500**, while PhD students are guaranteed up to **\$3,000** over the course of their program for travel to conferences and meetings. It will be at the discretion of the Advisor to approve the travel regardless of whether the student is presenting or not. Students are strongly encouraged to apply for external travel awards. Faculty are encouraged to fund travel for their postdoctoral fellows and research associates.

### Graduate Teaching Assistantships (GTA)

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Incoming graduate students are eligible for a 0.5 GTA within their first 4 semesters, based on availability and qualifications. GTA opportunities are posted prior to the start of the Fall, Winter and Summer semesters outside the Biomedical Sciences main office (room OVC 2631) and online at [https://www.uoguelph.ca/sessional\\_ta/](https://www.uoguelph.ca/sessional_ta/).

### OVC Awards

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Available awards are listed on the OVC Website' and can be found at: <http://www.ovc.uoguelph.ca/research/en/researchtrainingopportunities/inprogramgraduateawards.asp>, although specific awards offered vary from year to year. There are a wide range of awards; some are ACCESS awards that take into consideration financial need. Some awards are very narrowly targeted, so the odds of success can be comparatively high.

### External awards

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Students are **strongly** encouraged to apply for both external and internal awards. Remember to give your referees at least a week to prepare a letter of reference.

The major external awards that Biomedical Sciences Students most often apply for include:

1. Natural Sciences and Engineering Research Council of Canada Postgraduate Scholarships ([NSERC-PGS](#))



- a. must be Canadians or permanent residents and have at least an 'A-' average (first-class standing) in each of the last two years of full-time study
  - b. must have completed more than 12 months of graduate studies at time of application
2. Ontario Graduate Scholarships (OGS)
    - a. Canadians or permanent residents (some awards may be available for visa students)
    - b. must have a first-class (A-) standing in each of the last two years of full-time
  3. Canadian Institute of Health Research (CIHR)
    - a. must be a Canadian citizen or a permanent resident
    - b. must have been registered for no more than ten months
    - c. persons with a health professional degree are eligible to apply for a post doctoral fellowship but not to both in the same year (i.e., September through August). program.
  4. University wide internal sources
    - a. Wide range of awards; some are ACCESS awards that take into consideration financial need.

## Graduate Student Representative Roles

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### Graduate Student Association (GSA) Executive Council

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- Any graduate student in Biomedical Sciences who has previously served on the GSA Board of General Directors is eligible to run for nomination for the GSA Executive Council (President, VP Internal, VP Finance, VP External).
  - Duties vary with executive position
- If elected, this student will represent the graduate student population for the University as a whole. Therefore, this student will not be a representative for the Department of Biomedical Sciences.
- Term: May - April

### Graduate Student Association (GSA) Biomedical Science General Directors

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- Any graduate student in Biomedical Sciences is eligible to run for election. Election is based on votes from only graduate students in the Department of Biomedical Sciences.
- Responsibilities include:
  - Attend monthly GSA board meetings
  - Communicate GSA news to department on a monthly basis, within one week following GSA board meetings
  - Represent GSA on at least 1 GSA committee or University committee
- Term: October - September

### Graduate Student Representative

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- Any graduate student in Biomedical Sciences
- Selected by Graduate Program Coordinator

- Responsibilities include:
  - Attend graduate program committee meetings upon invitation/any departmental meetings associated with graduate students
  - Plan social events for graduate students
    - GSA Biomedical Sciences General Directors can/will also assist in event planning
  - Plan graduate orientation activities
  - Attend monthly meetings with GSA Biomedical Sciences General Directors in order to bridge communication between department and GSA
- Term: September – August

## Useful references

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- How to write and publish a scientific paper. 5<sup>th</sup> edition, (1998) Robert A. Day, ISI Press.
- Scientific Integrity. An Introductory Text with Cases. Macrina, F.L. (1995, 2000, 2005) ASM Press: Washington, DC
- At the Bench: A Laboratory Navigator, Updated Edition, Kathy Barker (2005) Cold Spring Harbor Laboratory Press
- ASM Style Manual (1991) ASM Press and others