



## Graduate Student Handbook

**2019-2020**

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This document is not intended to replicate or modify the information found in the School of Graduate Studies (SGS) Calendar (available at <https://graduate.mcmaster.ca/grad-council/graduate-calendar.html>). If there is any discrepancy between this document and the SGS Calendar, then the School of Graduate Studies Calendar shall prevail. Students and faculty are encouraged to look at the SGS Calendar for information about:

- Graduate study at McMaster;
- General regulations of the School of Graduate Studies;
- University regulations;
- Graduate fees and financial assistance;
- University regulations affecting graduate students;
- University services;
- Fellowships, scholarships, bursaries and other awards;
- University governing bodies;
- Student appeals; and
- Degree programs (including degree requirements).

## **DEPARTMENTAL CONTACTS**

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## **GRADUATE STUDY AT MCMASTER UNIVERSITY**

When McMaster moved to its current graduate organization, the aims of graduate work were described as "the highest development of the powers of reasoning, judgment, and evaluation in intellectual concerns; specialized training in professional skills; initiation into research or scholarly work and development of a capacity for its successful and independent pursuit; the fruitful pursuit of research and scholarly work". This description remains as valid today as it was then. Research is central to graduate work, and McMaster's strong research orientation has a pronounced effect on the character of its graduate programs. The numerous research achievements of McMaster faculty members have been recognized by grants, prizes, medals,

and fellowships in academic societies. Such distinctions attest to the qualifications and dedication of faculty members in developing and disseminating knowledge. The education that McMaster faculty provide is valuable not only for the graduate student's career but also for the student's development as a person.

## **RESPONSIBILITIES OF GRADUATE STUDENTS TO THE UNIVERISTY**

Just as the University has responsibilities to graduate students, graduate students also have responsibilities to the University.

The student's responsibilities include, **but are not limited to**:

- Registering annually until graduation, withdrawal, or withdrawal in good standing due to time limit.
- Paying fees as required.
- Complying with the regulations of the School of Graduate Studies as set out in this calendar.

<http://academiccalendars.romcmaster.ca/index.php?catoid=25>

### **Academic Integrity**

The Office of Academic Integrity strives to assist instructors and students with issues of academic and research integrity. The McMaster University Academic Integrity Policy can be found here: <http://www.mcmaster.ca/academicintegrity/>. The McMaster University Research Integrity Policy can be found here:

<https://www.mcmaster.ca/policy/faculty/Research/ResearchIntegrityPolicy.pdf>

\*Please also take note of the policies and guidelines referring to student misconduct. The School of Biomedical Engineering will also adhere to these policies.

### **Leaves of Absence**

Leaves of absence are normally granted on a term-by-term basis and, whenever possible, should commence at the beginning of a term (i.e., January 1, May 1, or September 1). During the period of a Leave the student cannot expect to be given supervision or be entitled to use the University's facilities. Students applying for a leave of absence for personal reasons must normally have completed at least one year of full time graduate studies. During a Leave of Absence no tuition will be charged nor will the student be eligible for any scholarship support. The length of time for completing the degree (see qualifier in section 2.5.7 of the Graduate Calendar) will be extended by the duration of the Leave on the resumption of studies. Leaves of Absence affecting Teaching Assistantship duties are covered by the Collective Agreement with Local 3906 (Unit 1) of the Canadian Union of Public employees. Students should be aware that in the event of Leaves of Absence continuation of the same research project and/or supervisor cannot be guaranteed.

### **Reasons for Leaves of Absence**

A Leave of Absence for up to one year is permitted for medical reasons. A medical note by the physician or nurse practitioner that is taking care of the student is required at the time of submitting the petition and upon return. A parenting leave of absence can be up to 4 terms and requires a medical note as well, with details found at the website for the School of Graduate Studies.

Students who have successfully completed at least one full year in a graduate program may apply for a Leave of Absence for up to one year for other personal circumstances provided that the student's supervisor and the department support the request.

### **Vacation**

Full-time graduate students are expected to be on campus for all three terms of the university year, as specified in Section 1.3 of the Graduate Calendar. Normal vacation entitlement is two weeks of vacation during the year, to be scheduled by mutual agreement with the research supervisor and the employment supervisor. Exception to this allotment requires different levels of approval based on its duration, as listed in the Graduate Calendar.

## **SAFETY & SECURITY**

### **Mandatory Health and Safety Training**

Graduate students must complete the mandatory health and safety training courses.

1. Asbestos Awareness
2. Ergonomics
3. Fire Safety
4. Office WHMIS
5. Slips, Trips and Falls
6. Health and Safety Orientation Training
7. Violence and Harassment Training

Training can be completed on Mosaic. After completion students are required to send verification to their supervisor.

### **Emergency**

In case of emergency on campus dial 88. The McMaster Security office is located in E.T. Clarke 201 and can be contacted at ext. 24281. This office is responsible for overall security on campus.

### **Walk Home Service – SWHAT**

During the months of September through April, students operate a service called "Students Walk Home Attendant Team" (SWHAT). After dark, if you telephone ext. 27500, you can arrange to be escorted to your car or residence by a male and a female student. During the summer term, Campus Security will escort you to your car or residence and they can be reached at ext. 27500.

## **GRADUATE STUDIES AT MCMASTER**

### **Registration**

*ALL incoming students are required to produce a career plan within their first year of study with the assistance of the staff in ECCS. The staff at ECCS will contact each student by email to set up an appointment to assist in preparing a career plan. A milestone report must be submitted to the*

*program administrator or director within the first year to be eligible to register for the second year of studies.*

All students are required to register for the academic year on-line using MOSAIC:

<https://graduate.mcmaster.ca/academic-services/how-enroll>

ALL STUDENTS MUST REGISTER FOR PLACEHOLDER SGS 700 FOR EACH TERM EVEN IF THEY ARE NOT TAKING COURSES. This “placeholder” course ensures that you are fully registered at the university.

Sessional Dates: <https://academiccalendars.romcmaster.ca/content.php?catoid=37&navoid=7560>

Tuition and Fees: [http://www.mcmaster.ca/bms/student/pdf/fees\\_grad.pdf](http://www.mcmaster.ca/bms/student/pdf/fees_grad.pdf)

Initially you will require both your student number and your bar code shown on your admission letter or student card to set a PIN number. Any student who fails to register on time will be charged a late fee.

In addition to completing registration, students are also required to complete a payment agreement using MOSAIC.

For more information on how to complete your Payment Agreement, please refer to the “Financial Matters” section of the School of Graduate Studies Calendar, 2018-2019.

Funding Options: [http://www.mcmaster.ca/bms/student/SAC\\_funding.html](http://www.mcmaster.ca/bms/student/SAC_funding.html)

Payment Guide: [http://www.mcmaster.ca/bms/student/pdf/SAC\\_pa\\_guide.pdf](http://www.mcmaster.ca/bms/student/pdf/SAC_pa_guide.pdf)

### **Teaching Assistant**

ALL NEW TAs as of September 2017 will be expected to attend a workshop on being a Teaching Assistant. This workshop will be 5 hours and the TA will be paid for this time. TA must attend the entire workshop. This workshop will cover grading and leading a tutorial such as setting up a lecture plan and handling different personality types and will have exercises for same.

Once you are assigned a TA, you will be required to complete an ‘Hours of Work’ form that specifically includes the duties you are required to complete. The course supervisor and the student need to sign off on the completed form.

### **New VISA Students**

Visa Students must register on-line, but will receive the message "Study Permit Required". Registration will not be complete until a copy of the study permit has been presented to the Graduate Studies office (Gilmour Hall, Room 212).

### **Email**

The School of Graduate Studies and the Department will use electronic mail to communicate directly with graduate students at various times during the year. The University Technology Services (UTS) provides each with an e-mail address. You are required to "self-register" for your e-mail address via MOSAIC.

During the self-registration process you will be given a password, it is important to keep a note of this original password, it will be required again for library and computer access. If you have any major problems you can call the UTS helpline ext. 24357.

All students are required to register for services on MOSAIC on an annual basis. Student accounts not renewed by October 15 are disabled and subject to deletion. Students are expected to read their email on a regular basis. Not reading email messages will not be treated as a valid reason for not adhering to regulations, procedures or deadlines.

### **Mailboxes and Desk**

Each student will be provided a mailbox in ETB (Engineering Technology Building) on the 4th floor in the Biomedical Block (ETB 400). Any incoming mail will be distributed to the alphabetically labelled mail box.

Each student will also be assigned a desk or a shared desk in the graduate student office (ETB 303). It is **your responsibility** to empty and clean your desk at the end of your studies to ensure a new student is assigned a clean & available desk. Failure to do so will cause a delay in defending your thesis. The desk you are assigned is the desk you must stay at for the duration of your degree. If there are any issues please see the administrative assistant.

### **FINANCIAL SUPPORT**

#### **Payment of Departmental Scholarship & Teaching Assistantship - SGS Notifies Students of Pay Schedules.**

Taxes – The University is required by law to deduct Employment Insurance and Canada Pension premiums on ALL employment income. You should complete the Personal Tax Credit Return Forms (TD1 and TD1ON) which may lower the rate at which you are taxed. These forms are available on line on the School of Graduate Studies webpage under “Forms Initiated by a Student”:  
<http://www.workingatmcmaster.ca/hris/employee/TD1/>

CUPE - If you are receiving a Teaching Assistantship (TA) or a Research Assistantship (RA) in lieu of TA, you are a member of the Canadian Union of Public Employees, Local 3906. Union dues are deducted in each month in which you receive TA/RA monies.

Dental Plan - All full-time graduate students who are receiving a TA and/or a RA in lieu of a TA of 130 hours or greater will have Dental Plan premiums deducted each month for the full year (September to August). Information on the Dental Plan is available.



## **Employment Regulations**

There are 3 terms in the School of Graduate Studies: Fall (September to December), Winter (January to April), and Summer (May to August). Students who begin as full-time students are expected to remain full-time until the degree requirements are completed, or until they take up employment of more than 505 hours per academic year, which includes work as a Teaching Assistant or RA in Lieu of TA. In the latter case, they are no longer considered full-time students (but continue to pay the fee schedule set out for the regular program). Once the student has ceased full-time status, it cannot be regained unless approved by both the Department and School of Graduate Studies.

If a student is to be employed at the University as other than as a TA, the School of Graduate Studies will track the hours and flag any student who is above the 505 hour threshold.

## **Discounted Fees**

Only full-time Ph.D. students (term 13 or greater) will be charged tuition at a discounted rate. The discounted tuition rate is normally equal to ½ of the domestic tuition rate.

## **Tuition Fees Overall – 2018/2020**

Canadian Fees Full Time = \$6307.20

Visa Fees Full Time = \$17,096.22

Mandatory Supplementary Fees = \$957.24 (Full time)

Full Disclosure: [http://www.mcmaster.ca/bms/student/pdf/fees\\_grad.pdf](http://www.mcmaster.ca/bms/student/pdf/fees_grad.pdf)

## **SCHOLARSHIPS & AWARDS**

Terms and conditions related to financial support are found in Sec. 5.2. of the graduate calendar. Recipients of graduate scholarships and awards are made on the basis of academic merit or other achieved merit. General information on scholarships is available in the Graduate Calendar (Section 8) and online: <https://gs.mcmaster.ca/awards-funding/scholarships>.

Per the policy of the Faculty, students receiving a major external scholarship after they commence in their degree program (for example, NSERC CGS-D) and currently receiving a graduate scholarship from the university may have their university-provided stipend reduced by no more than \$2,500 per term for each term in which the student holds the external award (i.e., maximum stipend adjustment of \$7,500 per year).

## **UNIVERSITY ADMINISTRATIVE INFORMATION**

### **Graduate Transcripts**

If you wish to obtain a McMaster graduate transcript, you must place your order with the receptionist in the Office of the Registrar (Gilmour Hall, Room 108). The form is available on-line at: <https://registrar.mcmaster.ca/services/transcripts/request/>

### **Housing**

In an effort to assist students in their search for housing, the University operates an Off-Campus

Resource Centre. The office is located in MUSC B112. For additional information, please visit: <http://macoffcampus.mcmaster.ca/>

### **Parking & Transit Services**

Security & Parking Services strive to provide our University Community and visitors, with safe and well maintained parking and transiting infrastructure. The University is dedicated to courteous and helpful customer service through information resources, polite and knowledgeable staff, and convenient parking facilities. If you require parking for an extended period, please contact the Parking & Transit Service Office: <http://parking.mcmaster.ca/>

### **Student Wellness Centre**

The Student Wellness Centre is a resource for all McMaster students. It offers services in several main areas: personal counseling, academic skills, services for students with disabilities and Leadership Training. Located in MUSC B118.

### **Student Health Services**

The medical services are located in the McMaster University Student Centre B101 ext. 27700. Health care is available throughout the year. Whether you have a health emergency, a concern about nutrition, or a bad case of the flu, you can expect care, dispensed by health professionals who are friendly, concerned and accessible. <http://wellness.mcmaster.ca/>

### **Financial Aid & Scholarships**

The Student Financial Aid & Scholarships office provides service to students in all areas of financial support: loans (i.e. OSAP, BCSAP), bursaries, work programs and scholarships. <http://sfas.mcmaster.ca/>

### **McMaster Library**

McMaster University has four libraries to help with your research, teaching and learning.

- [Mills Memorial Library](#) (Humanities and Social Sciences)
- [Innis Library](#) (Business) located in Kenneth Taylor Hall, Room 108
- [H.G.Thode Library of Science & Engineering](#)
- [Health Sciences Library](#) housed in the Health Sciences Centre

### **International Student Services**

The aim of McMaster University's International Students Services (ISS) is to make your stay as comfortable and beneficial as possible. <https://iss.mcmaster.ca/>

### **Graduate Students Association (GSA)**

The mandate of the GSA is to promote the welfare and interests of the members through the provision of facilities and opportunities for social, athletic and intellectual activities; to the members before the duly elected and appointed authorities of McMaster University, and to promote communication and participation in all matters of common interest between the members of other student organizations, both at McMaster and in other educational institutions. <http://www.mcmaster.ca/gsa/>

### **Engineering Graduate Society (EGS)**

The Engineering Graduate Society is an official organization in support graduate students in Engineering and who organize events, both educational and social, for the development of all graduate students with the aim of impacting the student experience while at McMaster for the better. More information can be found at:

<http://egs.mcmaster.ca/>

### **Biomedical Engineering Graduate Students Association (BMEGA)**

The Biomedical Engineering Graduate Association is a group of about five students within BME who, throughout the year, organize fun and exciting social get-togethers for BME. In this respect, the goal is to bring us together through exciting and/or relaxing social activities that help build relationships, memories, and a unique identity, thus making the BME program more than about research and academia.

In the past BMEGA has organized the following events:

- The Inside Ride: Coast to Coast Against Cancer, where we put together a BME team of 6 who competed in an indoor cycling competition and helped raise money for children and families affected by cancer.
- Co-recreational Volleyball Intramurals
- Hallowe'en Party and Pumpkin Carving Contest
- Rock Climbing
- Winter Holiday Wine and Cheese Get-Together
- Salvation Army Food Hamper and Gifts for Children Volunteering
- Second Term Wine and Cheese Get-Together
- Sushi Dinner at Sapporos
- GSA Reading Week Ski Trip
- GSA D-League Softball (all summer long!)
- Phoenix Lunches
- Golf Day
- BME Open House (recruitment)

BMEGA can be reached by email at [bmega@mcmaster.ca](mailto:bmega@mcmaster.ca).

## **INTERNATIONAL STUDENTS**

### **Student Visa, Employment Authorization**

Visa students are required to provide photocopies of their study permit and/or employment authorization to the School of Graduate Studies.

### **Immigration Information**

For information on renewing your student visa or other immigration information, please visit the Citizenship and Immigration Canada site: <http://www.cic.gc.ca/>

### **Social Insurance Number (SIN)**

If you have a Teaching Assistantship or Research Assistant position as part of your offer of admission, you will need to apply for a SIN. The Service Canada Office is located at 1550 Upper James Street and is open Monday to Friday from 8:30 am to 4:00 pm. The SIN application can be found on the Service Canada site:

<http://www.servicecanada.gc.ca/eng/sin/apply/how.shtml>

You will require the following documents when applying for your SIN:

- A job offer. Please contact the department to obtain this letter
- Your passport and study permit
- Social Insurance Number application form

### **University Health Insurance Plan (UHIP)**

Your UHIP coverage will begin once you arrive on campus, enrollment is done automatically once you are fully registered in the program. All students with dependents living in Ontario must submit an application form to enroll their dependents and pay the appropriate additional fees. To complete an application form, please visit the International Student Services (ISS) office in Gilmour Hall room 104. For the 2018/2019 academic year, the cost of single coverage for 12 months is \$612.00. This amount is pro-rated for students who begin in January or May.

## **GRADUATE STUDIES IN BIOMEDICAL ENGINEERING**

### **Course Registration**

The complete list of graduate courses in the School of Biomedical Engineering is listed in the School of Graduate Studies Calendar 2019-2020. At least 50% of the required courses for the degree must be selected from this list, and any courses selected outside of the list must have the Director's approval to count as a required course. All graduate courses for BME must be from engineering, science or health sciences.

Current courses being offered can be found at the following link:

<https://www.eng.mcmaster.ca/msbe/programs/course-listing> For other and cross-listed courses, see the Calendar at:

[https://academiccalendars.romcmaster.ca/preview\\_program.php?catoid=37&poid=19924&hl=%22biomed%22&returnto=search](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=37&poid=19924&hl=%22biomed%22&returnto=search)

You will need to register for graduate courses using MOSAIC, please indicate the category (M) Masters, (D) Ph.D., or (EC) Extra Credit on this form.

M (Count towards primary academic program requirements of the Master degree requirements)  
This category identifies the courses that are to count towards the Master's degree requirements (including any additional graduate requirements or undergraduate courses specified by the supervisory committee or Department Chair). The passing grades for a Masters course are A+, A, A-, B+, B, and B-.

D (Count towards primary academic program requirements of the Doctoral degree requirements)  
This category identifies the courses that are to count towards the Doctoral degree requirements (including any additional graduate requirements or undergraduate courses specified by the

supervisory committee or Department Chair). The passing grades for a Doctoral course are A+, A, A-, B+, B, and B-

#### EC (Extra Course)

This category identifies courses that the student is taking with the approval of their supervisor but that are not required for the degree. In order to designate a course as extra, a student will have to submit a course designation request during the normal add period of enrollment in a particular term. The form is submitted to the program office and once approved will have the designation added to the enrollment record for that course only. If a failing grade (less than B-) is received in a course taken as Extra, the course and grade will not appear on the student's transcript unless there is a case of academic dishonesty. Students must petition to change the designation of an Extra Course to a Masters or Doctoral course, prior to the deadline to drop a course, provided that this change is supported by the supervisor and program. Changes of designation after the drop date will not be approved. Courses designated as Extra Course may subsequently be counted towards graduate degree requirements and the course designation changed to Masters or Doctoral, if approved by the Faculty Admissions and Study Committee of the Associate Dean (on its behalf). The passing grades for an Extra Course are A+, A, A-, B+, B, and B-.

Courses that are required by the Supervisory Committee or Department Chair as additional requirements in excess of the stated minimum for the program must be designated as Masters or Doctoral.

Note: Graduate students should make their course selection after consulting with their research supervisor.

#### **Audit Courses**

It is possible for graduate students to audit a graduate course under regulations given in the School of Graduate Studies Calendar. Auditing allows a student to participate in a course without being assigned a mark. The course will show up on the transcript as an audited course, but it will not count as an M, D, or EC course nor can it be used satisfy any degree program requirements. In order to audit a course, permission must be granted by the instructor. To apply to audit a course, a student must complete the Audit Graduate Course Form

#### **Required Courses for All Graduate Students**

All graduate students must complete and pass SGS #101 – Academic Research Integrity and Ethics within the first 12 months after their admission. The purpose of this course is to ensure that the standards and expectations of academic integrity and research ethics are communicated and understood by students. Registration for this course is completed on MOSAIC. If you have taken SGS #101 but have not fulfilled the requirements, you will be required to take it until completion. All graduate students are also required to complete and pass SGS #201 – Accessibility for Ontarians with Disabilities Act (AODA), which can be completed online at [www.mcmaster.ca/accessibility](http://www.mcmaster.ca/accessibility).

Students may not graduate or register in subsequent academic year without having successfully completed these courses.

During an academic term in which students are not enrolled in courses but remain active in their research as a graduate student at McMaster University, students must enroll in SGS #700 – Placeholder, in order to alert the Department and School of Graduate Studies of their activity. Otherwise, this course is not required if students are enrolled in and completing academic courses.

## **Core Courses**

[BIOMED \\*701 / Biomedical Engineering](#) (Core) – 3 unit(s) M. Noseworthy

- An introduction to biomedical engineering. The biological, chemical, electrical, and mechanical principles involve the design and operation of medical devices and bioprocesses. The research themes of the School of Biomedical Engineering are emphasized: biomaterials and tissue engineering; biomedical imaging; biomedical technology (e.g. biophotonics and medical robotics); bioprocessing.

[BIOMED 706 / Biomedical Engineering II](#) (Core) – 3 unit(s) R. Mishra (course cross-listed as [CHEM ENG 781](#))

- An introduction to biomedical engineering with a health science focus. The biological and chemical concepts involved in the design and operation of medical devices and biological processes will be discussed. The following research themes will be emphasized: cell biological responses to biomaterials, toxicity / pharmacokinetics, tissue and genetic engineering, gene therapy, biotechnology physiological response to biomaterials.  
\*All Students are welcome to take both.\*

## **Career Planning – CARP – Mandatory Program Requirement**

- Graduate students entering into Masters or Doctoral programs within the Faculty of Engineering are required to complete a career planning exercise within their first academic year (September to August). The report should be no more than two pages and must be submitted to the department's graduate Administrator before the end of August in their first year. For students who start their programs in May or January their career plan must be submitted by the end of their first 12 months in the program. In preparation for writing this career planning exercise, students will be contacted by the Engineering Career Services Dept. for career counseling sessions.

## **Degree Completion Overview and Transferring to a Ph.D.**

- Masters Students require 3 one-term courses to complete their M.A.Sc. degree.
- M.A.Sc. that complete their degree at McMaster and then move on to a PhD will need 2 half term courses at the PhD level.
- McMaster BME M.A.Sc. that transfer to the Ph.D. program without completing their M.A.Sc. will need a total of 5 half term courses to complete their PhD degree (2 of which needed to be completed with a B+ while they were still in the M.A.Sc.).
- PhD students transferring from a different university will need 3 half term courses to complete their degree.

## **Co-op**

The Co-op Program for Graduate students is an optional program for full-time domestic and international Masters and Ph.D. students in good academic standing that allows students to gain engineering work experience prior to graduation. Students are required to complete a minimum of 8-months of work experience for Masters students, and 12-months of work experience for Ph.D. students prior to graduation. It is administered by the Career Development & Relationship Manager - Graduate Studies. <https://www.eng.mcmaster.ca/co-op-career/co-op-program#FAQs>

## **Completion of Course Requirements**

Graduate students who have finished all courses must still use the course selection screen to select non-coursework activities: Research, Project or Thesis to indicate their current study status. For graduate students selecting non-coursework activities the following rules apply:

- Project and thesis are mutually exclusive and cannot be selected at the same time
- Students with discounted fees may only select thesis.

### **SGS Policy: Course Registration & Withdrawal Dates**

There is a deadline date for both registration and changes (drop and add) for courses. The drop and add dates are posted in the SGS Graduate Calendar. It is the student's responsibility to drop and add courses from their academic record. Drop and Add Dates:

<http://academiccalendars.romcmaster.ca/index.php?catoid=25>

In certain circumstances, it is possible to change course selection after the deadline date. Please note that students will require approval from their supervisor, Director of the School and the School of Graduate Studies. To request the change, the student must complete a Petition for Special Consideration which can be completed electronically through this link:

<https://graduate.mcmaster.ca/resources>

### **Biomedical Engineering Symposium and Seminars**

The School of Biomedical Engineering runs an annual 2 day Biomedical Engineering Symposium (in January). Attendance of all registered Masters and Ph.D. students in the Biomedical Engineering program is mandatory. Students are also required to present one seminar on the research they have carried out while enrolled in the program. Students can present their seminar during one of the following events:

1. The BME symposium (Spring)
2. The Health Sciences Plenary (May)
3. The Fall seminar day
4. 'METRIC' conference hosted by the Engineering Graduate Society, EGS, [egs@mcmaster.ca](mailto:egs@mcmaster.ca), [egs.mcmaster.ca](http://egs.mcmaster.ca)

### **Master's Program**

An M.A.Sc. Candidate entering in the 2018/2019 cohort is required to complete at least three (3) one-term courses and present a thesis embodying an original contribution to biomedical engineering; students of different cohorts may have different requirements. The thesis must be defended in an oral examination. M.A.Sc. students must complete one of the biomedical core courses (BME \*701 Biomedical Engineering – Core I for students from a health/life sciences background or BME \*706 Biomedical Engineering – Core II for students from an Engineering background). At least two of the courses must be at the 700 level.

A twenty-four (24) month period with funding has been set for our research based M.A.Sc. program. The maximum time for completion of the degree is three (3) years from initial registration, 5 years for part-time students.

### **Mandatory Meetings For M.A.Sc. Students**

Effective September 1, 2017, M.A.Sc. students will need to fill out a Supervisory Committee Report form with their supervisor/co-supervisor (if applicable).

Using the supervisory committee meeting report form that is used for doctoral students, a faculty

member must give each of their Masters students (M.A.Sc.) a mid-program progress review and submit that form to their department (and ultimately to SGS). The review should come within 6 months for students who are considering transferring to the Ph.D. program. Otherwise, the review occurs within the first 12 months. The committee must consist of your supervisor and at least 2 other members. Each student is responsible, together with their supervisor, to select and organize their supervisory committee meetings.

Part-time students must also receive a review after their first year. A student starting in September must have the report done by November 30 of the following year and within one year from September 1 in the subsequent years; students starting in January are due by November 1 of the same year and within 1 year of September of the subsequent years; students starting in May are due by November 1 of the same year and within 1 year of May of the subsequent years.

### **Master's Thesis**

The administration of the M.A.Sc. thesis defence is the responsibility of the School. The School recommends that the thesis follow the format described by Graduate Studies in their booklet "Guide for the Preparation of Theses" at [https://gs.mcmaster.ca/sites/default/files/resources/guide\\_for\\_the\\_preparation\\_of\\_masters\\_and\\_doctoral\\_theses- december 2016.pdf](https://gs.mcmaster.ca/sites/default/files/resources/guide_for_the_preparation_of_masters_and_doctoral_theses- december 2016.pdf)

The student is responsible for ensuring that the format satisfies the University requirements. The sequence of events is as follows:

- The student's supervisor gives permission to prepare the thesis. The student is responsible for submitting the thesis either hard copy or electronic copy, reasonably free of grammatical, typographical and technical errors to the examiners and to the Chair of the defense. If the thesis is found to contain an excessive number of errors, it will be returned to the student and the oral examination postponed until a satisfactory thesis has been submitted.
- The student's supervisor(s) and two other faculty members, one of whom may be from a department other than Biomedical Engineering, sit as an examining committee for the thesis. The Associate Vice-President & Dean of Graduate Studies may appoint members to these committees. The supervisor usually acts as Chair of the examination committee.
- The committee will be approved by the Director. The Administrator will prepare the appropriate forms and provide them to the Chair of the examination committee.
- Each student is responsible, together with their supervisor organize their Master's Defence.

After a successful examination and all requested changes have been made, the student will upload the final e-thesis to MacSphere (see section 2.8 of School of Graduate Studies Calendar). Students must submit their final thesis within four weeks of a successful defence when only minor changes are required of the student by the examining committee. When major revisions are required by the examining committee, the student will have one term (4 months) to complete those changes.

If some of the research undertaken expressly for the degree has previously been published or prepared for publication by the student as one or more journal articles, or parts of books, those items may be included within the thesis subject to the School of Graduate Studies' regulations and to obtaining permission from the supervisory committee. Please consult the "Guide for the Preparation Theses" for more detailed information on Sandwich Theses.

The student is required to submit the following forms to the program Administrator for processing. Both forms can be found at <https://gs.mcmaster.ca/resources>:



1. Final Thesis Submission Form
2. License to McMaster University Form

### **Transfer from M.A.Sc. to Ph.D. without completion of Master's Thesis**

Students enrolled in the M.A.Sc. program may be transferred to the Ph.D. program prior to the completion of the M.A.Sc. degree. Transfer to the Ph.D. without completion of the M.A.Sc. is intended to expedite the student's progress towards the Ph.D. by not requiring the preparation of the formal M.A.Sc. thesis and allowing the research carried out during enrollment in the M.A.Sc. program to be used in the Ph.D. thesis. The expectation for transfer to Ph.D. is that the research progress at the M.A.Sc. level should be exemplary. The candidate will be expected to have completed a minimum of two (2) half courses with a grade average of B+ or better. Each student is responsible, together with their supervisor, to select and organize their transfer examination committee. The possibility of transfer to Ph.D. should be discussed by the student and the research supervisor early in the M.A.Sc. program and then the following procedure should be followed:

- After a minimum of one year in the M.A.Sc. program at McMaster students may request in writing to the Director to be transferred to the Ph.D. program. **The program encourages students to transfer between 12 and 20 months.**
- The Director will then appoint an Examining Committee comprising of two (2) faculty members, in addition to the student's research supervisor(s).
- The student will provide four (4) copies of a formal written transfer report, which summarizes the student's research work to date, to the School office no later than ten (10) days before the scheduled examination date.

The transfer report is not a thesis and need not follow the M.A.Sc. thesis preparation requirements since the report will not be kept for archival purposes. The maximum length is 25 single-spaced pages. The transfer report must address the following:

- Definition of the research problem.
- Brief critical review of the relevant literature.
- Summary of the completed work including: experimental equipment built, experimental techniques developed, experimental data gathered and analyzed. The summary must clearly show the Examining Committee some contribution to biomedical engineering research.
- Scope of the completed work as a basis for future Ph.D. studies. The emphasis is on research progress and completed work and not on the research plan for the Ph.D.
- The examination will consist of an oral presentation, 20-30 minutes in duration, summarizing the research progress to date. The candidate will then have a session of questioning by the Examining Committee members only.
- The Examining Committee will evaluate the student's course standings, transfer report, oral presentation of the research progress and the answers provided during the examination.

The outcome of the examination is that the School recommends to the Committee on Graduate Admissions and Study one of the following:

1. Admission to Ph.D. studies following completion of the requirements of the M.A.Sc. degree.
2. Admission to Ph.D. studies without completion of an M.A.Sc. program.
3. Admission to Ph.D. studies but with concurrent completion of all requirements for an M.A.Sc. degree within two months from the date of reclassification.

4. Refusal of admission to Ph.D. studies.

### **Ph.D. Program**

The minimum course requirement for this degree for the 2019/2020 incoming cohort is at least five (5) half courses beyond the baccalaureate degree or two (2) half courses beyond the M.A.Sc. degree; students of different cohorts may have different requirements.

A minimum of two half-year graduate courses beyond the Masters Degree requirement. For students from engineering backgrounds who have previously taken the core course, one course must be from Health Sciences offerings. If the core course is required, one courses beyond the core course must be from Health Sciences offerings. Students completing a PhD will be required to complete 2 courses beyond the masters or 5 courses beyond the baccalaureate degree. One must be the core course and one additional course must be from the complimentary discipline from their background (Engineering students must take at least one 700 level Health Science Course, Health/Life Science students must take at least one 700 level engineering course).

A forty-eight (48) month period with funding has been set for our Ph.D. program. The maximum time for completion of the degree is six (6) years from initial registration, 8 years for part-time students.

### **Career Planning – CARP – Mandatory Program Requirement**

Graduate students entering into Masters or Doctoral programs within the Faculty of Engineering are required to complete a career planning exercise within their first academic year (September to August). The report should be no more than two pages and must be submitted to the department's graduate Administrator before the end of August in their first year. For students who start their programs in May or January their career plan must be submitted by the end of their first 12 months in the program. In preparation for writing this career planning exercise, students will be contacted by the Engineering Career Services Dept. for career counseling sessions.

### **Ph.D. Supervisory Committee Meetings**

In accordance with the regulations of the School of Graduate Studies (Sections 1.2.4, 2.6 and 4.5 of the Graduate Calendar), all Ph.D. and M.A.Sc. students will have a Supervisory Committee which should meet at least once every year and provide the student with feedback regarding his/her coursework and research. Each student (Masters or Ph.D.) is responsible, together with their supervisor, to select and organize their supervisory committee. The committee will consist of the research supervisor(s) and two other professors in the School.

The School of Graduate Studies requires students to complete an online progress report during or prior to the committee meeting which becomes part of the overall Ph.D. Supervisory Committee report. The Committee is required to meet with the candidate at least once each academic year. A January and May start has until November 30 of that year to have their first meeting, while a September start may go past the November 30 deadline but must still have their first meeting within 12 months of starting.

As of June 30, 2018 all Ph.D. Supervisory Committee Reports will be filled out and submitted online. Your administrator will initiate this through SGS Administrative Tools and an email will be sent to the student.

## **Comprehensive Examinations for Ph.D. Students**

The comprehensive examination is a requirement of the PhD program. This examination normally takes place between 12 and 20 months after the start of the program. In all cases, this must be completed within 24 months after their start date. Each student is responsible, together with their supervisor, to select and organize their supervisory committee. This will be scheduled by the supervisory committee.

The format will resemble a committee meeting except it will be based on a written research proposal. The supervisory committee will meet to determine the written proposal topic and scope of the oral examination. The topic will be related to, but not the same as, the PhD research topic. The chosen topic is then submitted to the Director for approval. Additional candidate information is to be provided including start date in the program, number of committee meetings and progress to date.

The proposal will be up to 10,000 words plus references in length. Once the candidate received their topic they have 21 days to submit their proposal. An official letter is sent to the candidate outlining the proposal topic, examination procedures and guidelines. The oral examination will be one week after submission of the report. The examination will include an oral presentation, not more than 15 minutes in length. This is followed by a question period from the examination committee. The first round of questions is on the actual proposal and the second round will be related to general Biomedical Engineering. The total examination will normally be 2 hours in length, but no more than 3 hours.

The comprehensive results form is to be completed by the chair and submitted to the Director for approval. This form can be found at: <http://graduate.mcmaster.ca/current-students/forms/department-forms>. The exam will be graded as either pass (P), pass with distinction (P+), or fail (F). The completed form is then submitted to the administrator who will forward to Graduate Studies and update the candidate's departmental file. If a failure is noted the student will be given one further attempt at passing. The new exam normally occurs within one month of the previous attempt and will be with a new topic, but same examining panel. A second failure will result in automatic dismissal from the program.

## **Structure of the Examining Committee**

The examination committee consists of an examination chair, 2 members of your supervisory committee, and one additional member whose area is relevant to the examination topic. Suggestions for the additional member will be provided by your supervisory committee and approved by the Director. During the initial committee meeting the chair of the committee will also be determined. The supervisor is present for the examination but is not part of the official panel. The roll of your supervisor will be to assess and convey the degree of fairness of the exam to the examining committee. They will not have any vote on the outcome of the exam.

## **Format of the Examination**

The Comprehensive Examination will consist of a written report and an oral presentation.

The candidate will be required to submit a proposal, 10,000 words of text plus references, on a research topic related to, but not the same as the Ph.D. research topic. The candidate will be required to prepare this report within 21 days of receiving the proposal topic.

The written report must include:

- Proposal objectives: both short and long term
- Literature pertinent to the proposal
- Methods and proposed approach
- Milestones for specific objectives and tasks
- Anticipated significance of the work

The oral examination will be conducted in two parts. In the first part, the candidate will be required to make a brief presentation of the report, maximum of 15 minutes, followed by questions directly related to the report. The second part of the oral examination will probe the candidate's general comprehension of the research field and peripheral areas. The oral examination will normally require two (2) hours to complete but in no case will continue for more than three (3) hours.

It is the responsibility of the Chair of the Examining Committee to call a meeting of the Committee at least five (5) weeks in advance of the examination date to review the candidate's records and background to determine an appropriate research topic and scope of background examination.

A candidate who fails the comprehensive examination will be given a second opportunity to retake the portion(s) of the exam deemed to have been failed. There is no opportunity for a third attempt.

The Chair of the Examining Committee will communicate the results of the examination, in writing, to the Director of the School who will communicate the result, in writing, to the candidate.

### **Ph.D. Thesis**

Here is the link to guide you through the preparation of your Doctoral theses:

Guide for Preparation of a Master's or Ph.D. Thesis:

[https://gs.mcmaster.ca/sites/default/files/resources/guide\\_for\\_the\\_preparation\\_of\\_masters\\_and\\_doctoral\\_theses- december\\_2016.pdf](https://gs.mcmaster.ca/sites/default/files/resources/guide_for_the_preparation_of_masters_and_doctoral_theses- december_2016.pdf)

Students close to submitting their Ph.D. thesis (approximately 2 months) should complete the on-line Thesis Defence System (TDS).

This will begin the thesis defence schedule. Candidates will be asked for a thesis title and estimated date to submit the thesis. Under separate cover, the supervisor will be asked to submit the name of an external examiner which must be approved by the supervisory committee and School. A final date and time of the defence will be scheduled and approved by the student, supervisory committee and external examiner.

Doctoral students and their supervisors should note that theses of extraordinary length are to be discouraged. As a general rule, doctoral students are urged to limit theses to no greater length than three hundred (300) manuscript pages. In cases where students and their supervisor(s) believe that responsible scholarly treatment of the thesis topic requires substantially greater length than that specified above, they are expected to receive written approval from the Associate Dean of Graduate Studies before the thesis is submitted for the defence.

If some of the research undertaken expressly for the degree has previously been published or prepared for publication by the student as one or more journal articles, or parts of books, those items may be included within the thesis subject to the School of Graduate Studies' regulations and to obtaining permission from the supervisory committee. Please consult the "Guide for the Preparation Theses" for more detailed information on Sandwich Theses.

After a successful defense, the candidate must correct any errors detected by the readers to the satisfaction of the Supervisor and then submit an electronic copy to the School of Graduate Studies via MacSphere (see Section 2.8.3 of School of Graduate Studies Calendar - Publication of Electronic Theses at McMaster University). The fee for archiving the thesis is paid by the student. Students must submit their final thesis within four weeks of a successful defence when only minor changes are required of the student by the examining committee. When major revisions are required by the examining committee, the student will have one term (4 months) to complete those changes.

### **Deadlines**

A thesis may be submitted at any time. However, there are two deadlines for the submission of the Ph.D. thesis to Graduate Studies electronically and complete degree requirements for Autumn or Spring Convocation. For 2019-2020, the dates can be found in the 2019/2020 Graduate Studies Calendar.

### **Departmental & University Thesis Procedure**

The School of Graduate Studies (SGS) has forms, regulations and information regarding thesis preparation; these are available from the SGS website.

Ph.D. Defense Thesis Defence Process:

[https://gs.mcmaster.ca/sites/default/files/resources/the\\_student\\_guide\\_to\\_the\\_phd\\_defence\\_process\\_0.pdf](https://gs.mcmaster.ca/sites/default/files/resources/the_student_guide_to_the_phd_defence_process_0.pdf)

I confirm that I have received the Biomedical Engineering Graduate Student Handbook, 2019-20.  
Please return a copy of this page to Jane Mah, Administrator (ETB-406) upon receipt.

In the case of discrepancy between this guide and other University policy, students are advised to consult the Graduate Calendar published by the School of Graduate Studies.

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Name

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Date

Revised July 17/19