

MHSc Student Handbook 2019-20



Institute of Biomaterials
& Biomedical Engineering
UNIVERSITY OF TORONTO

Institute of Biomaterials & Biomedical Engineering
2019-20 MHS&C Handbook

WELCOME

On behalf of the faculty and staff of the Institute of Biomaterials and Biomedical Engineering, we would like to extend a warm welcome to you. Whether you are new to the Institute or continuing in your graduate studies here at the University of Toronto, we hope that this handbook will be of assistance to you. We always welcome your comments and suggestions and look forward to assisting you throughout your graduate experience.

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Director

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1 Registration Policies and Procedures

Students registered as full-time students in the School of Graduate Studies must be engaged in their studies on a full-time basis, as required by government regulations for full-time graduate studies.

Full-time graduate students are defined according to government regulations as follows:

1. They must be pursuing their studies as a full-time occupation and identify themselves as full-time graduate students.
2. They must be designated by the University as full-time students.
3. They must be geographically available and visit the campus regularly.
4. They must be considered a full-time student by their supervisors.
5. If an academic program requires an absence from the University, students must apply through their graduate unit for permission to be off campus.

<http://www.sgs.utoronto.ca/calendar/Pages/Registration-and-Enrolment.aspx>

1.1 Registering in your Program and Fees

Students must register annually, in September, for each year of the program. New students must have cleared all conditional offers of admission prior to registration by submitting a final official transcript reflecting final grades and evidence of degree conferral to the Institute.

The School of Graduate Studies sends all registration material to students between July and August. If you have not received this information by mid-August, you should contact the graduate unit.

The initial payment of academic and incidental fees will ensure the student is registered in the program. Payment of fees must be made through a Canadian bank, payable to the University of Toronto in Canadian funds. Failure to register as required will cause the student's candidacy status to lapse. Payment can be made using online banking.

The SGS website is the most up-to-date place to find information on registration, fees, and University of Toronto policy. One very important link you may wish to use is:

<http://www.sgs.utoronto.ca/currentstudents/Pages/Graduate-Fees.aspx>

1.1.1 Late Registration

Students are responsible for ensuring proper registration by the appropriate deadlines. Late registration will be subject to an additional fee as outlined by the School of Graduate Studies.

1.2 Deferred Payment of Fees

Fee deferrals allow students to register for the academic year without having to make a payment toward their academic fees. Once approved, your fees are deferred until April 30th of the current academic year. Students are still eligible to make payments toward fees during the deferral period, though they are not

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required to. Interest is charged on any outstanding balance as of May 1st and the full balance must be paid by August in order for registration to be approved for the next academic year. Students with an outstanding balance will not be permitted to register for the upcoming year if there is an outstanding balance.

All MHSc students will have their fees deferred by the Professional programs office in August

1.3 Financial Support

The Institute's annual stipend for MHSc students can be found here: <https://ibbme.utoronto.ca/current-students/tuition-and-funding/>. Additional awards are not considered a top-up to this amount. Should you subsequently receive an award or multiple awards, your total stipend would be adjusted accordingly, depending on type and amount of the awards. Financial support beyond your first year will be contingent upon your satisfactory performance.

A chart of minimum stipend amounts can be found on the IBBME website under the Basic Funding tab: <http://ibbme.utoronto.ca/current-students/tuition-and-funding/>

You will be responsible for paying all tuition and fees to the School of Graduate Studies from the stipend mentioned above. Please take a moment to review the IBBME website under the Fees tab: <http://ibbme.utoronto.ca/prospective-students/master-of-health-science-mhsc/>

Students in the Collaborative Program will be funded following the policies of their home departments.

1.3.1 Domestic Students

- Domestic graduate students receive a minimum annual stipend during the BIU eligible years of their program. BIU eligibility is set by the Ministry of Education and is determined by the total number of years of graduate studies, which for the MHSc is 2 years. The minimum annual stipend for the program is equivalent to the program's tuition.
- IBBME supplements domestic student stipends with fellowship support to aid the supervisor. Additional awards are not considered a top-up to this amount. Students holding major awards of \$10k+ will not receive the IBBME fellowship and their supervisor will top up their award to meet the minimum stipend requirement.
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1.3.2

International Students

International students receive a minimum annual stipend equivalent to the year's tuition fees.

International students who obtain Permanent Resident status during their term as a full-time graduate student will only pay domestic student tuition and fees and may receive the IBBME fellowship support only if they fall within the BIU eligibility years (i.e. the first 2 years of study).

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1.4 Fellowships and Awards

Students are strongly encouraged to apply for external scholarships. Canadian citizens and permanent residents may apply for federal scholarships from granting agencies such as the Natural Sciences and Engineering Research Council of Canada (NSERC), or the Canadian Institutes of Health Research (CIHR), or provincial programs such as the Ontario Graduate Scholarship Program (OGS). Students may also apply for the Queen Elizabeth II - Graduate Scholarship in Science and Technology (QEII-GSST). Although NSERC and CIHR scholarships are strictly reserved for Canadian citizens and permanent residents, OGS and QEII-GSST awards are available to international students with outstanding academic records. Some scholarships may be multi-year awards, in which case, it is the student's responsibility to complete all necessary paperwork to allow continuation of his/her award.

For students registered in the Biomedical Engineering or the Clinical Engineering Programs, applications should be submitted to the IBBME Graduate Office. Students registered in the Collaborative Program should submit the application to their home departments. Additional information pertaining to deadlines can be found on the IBBME website.

Information on other external scholarships can be found through the School of Graduate Studies (<http://www.sgs.utoronto.ca>). Scholarship and fellowship opportunities are regularly announced by the Graduate Studies offices of both the Faculties of Engineering and Medicine. Students are strongly encouraged to consider these competitions.

2. Course Requirements

A two-year degree program that enables qualified engineers to effectively manage technology in a modern health care system. This program is intended for students who hold a Bachelor's degree in Engineering. All degree requirements must be completed within three calendar years.

The students must complete 4.0 full-course equivalents (FCE) as outlined below.

- BME1405H (0.5 FCE) or BME1439H (0.5 FCE), and BME1436H (0.5 FCE)
- Two of the following (1.0 FCE): BME1477H (0.5 FCE): Biomedical Engineering Project Design and Execution; BME1478H (0.5 FCE): Coding for Biomedical Engineers; or BME1479H (0.5 FCE): Statistical Discovery Techniques for Biomedical Researchers
- Two half course electives relevant to the student's area of research (1.0 FCE)
- BME4444Y (1.0 FCE) Practical Experience Course in health-care facilities, the medical device industry, or health-care consulting firms. The internship must total a minimum of 625 hours.
- Students must participate in: either BME1010H or BME1011H: Graduate Seminar series (0.0 FCE) and JDE1000H: Ethics in Research (0.0 FCE).

It is highly recommended that students complete their course requirements (i.e.: BME 1405 or BME1439H, BME 1436, two of BME1477/1478/1479, and two electives in the first year of studies.

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The above requirements apply to students who commenced their degrees in and after Sept. 2019. Students who commenced their degree in 2018 or prior are required to complete the following courses: BME1450, BME1436, BME 1405, BME1439 and two additional electives (0.5 FCE each). The requirements of seminar attendance, internship and ethics course completion remain the same.

A standard course curriculum for the Clinical Engineering Program includes: Year 1

Fall/ Winter terms

- Two of: BME 1477/1478/1479
- BME 1405H Clinical Engineering Instrumentation I (0.5 FCE)
- Two 0.5 FCE elective related to the student's area of research (total FCE 1.0 FCE)
- BME 1010H IBBME Graduate Student Seminar Series (0.0 FCE) Fall and Winter
- JDE 1000- ethics seminar (may take in Spring term)
- BME 1436H Clinical Engineering Surgery (0.5 FCE)

● **Summer term**

- BME 4444Y Internship (1.0 FCE total from all internships)
- Thesis Project

Year 2

● **Fall term**

- BME 1010H IBBME Graduate Student Seminar Series
- BME 4444Y Internship (1.0 FCE total from all internships)
- RST 9999Y Thesis Project (0.0 FCE)

● **Spring term**

- BME 1010H IBBME Graduate Student Seminar Series
- BME 4444Y Internship (1.0 FCE total from all internships)
- RST 9999Y Thesis Project (0.0 FCE)

● **Summer term**

- BME 4444Y Internship (1.0 FCE total from all internships)
- RST 9999Y Thesis Project (0.0 FCE)

2.1 Enrollment and Course Work

Students should select appropriate course electives for their degree in consultation with their thesis supervisor, while ensuring they clear any admission requirements. Approval from both supervisor and the graduate coordinator is required. The latter approval can be gained by filling in an online form on Quercus. Courses can subsequently be added via Acorn by the student. Students in the Collaborative Program should submit course choice to the collaborating departments and follow the guidelines of the collaborating departments with copies provided to the IBBME Graduate Office. Student should aim to complete all course work in the first year of their degree.

2.1.1 Adding and Dropping Courses

Students who wish to add or drop courses after enrolment deadlines (see SGS important dates) must complete an Add/Drop Form. The form must be submitted to the department after obtaining all necessary

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approvals. A student will not be able to add or drop courses after the prescribed deadlines of the department. The Institute's prescribed deadlines for changes are **one week prior** to the deadline dates scheduled at the School of Graduate Studies. For more information, see the SGS website at www.sgs.utoronto.ca.

2.1.2 Grading and Evaluation

Students normally receive a grade report for all courses completed within a given term. These reports are not official transcripts. Students requesting official transcripts must order them from the University of Toronto Transcript Centre located in the Sidney Smith Building at 100 St. George Street. Students may also obtain grades from the Student Web Service at <http://www.acorn.utoronto.ca/>

Additional information relating to grading scales and grading policies are found in the SGS Calendar under the section titled Graduate Grading and Evaluation Practices Policy.

2.2 Extra Courses not required for the Degree

Enrollments into additional courses not required for the degree are subject to the same regulations as those in the degree program. Students should check with the host department about course enrollment procedures.

2.3 Academic Standing and Satisfactory Progress

All graduate programs are composed of a number of academic requirements that include graduate courses and other academic activities, including participation in student seminars, annual committee meetings and student research. Students are required to maintain a minimum grade performance of A- in all graduate courses to be eligible for most scholarships. Students must maintain satisfactory progress in their research in order to remain in Good Standing with SGS and IBBME during completion of their degree program.

Progress in your degree program will be assessed each year and is measured by:

- Performance in your courses (the passing mark is B- in all courses, i.e. 70% and most graduate scholarships require a minimum GPA of A- or 3.7 for eligibility)
- Supervisory Committee Meetings (yearly or more frequently)/Satisfactory progress in research

After each session, the Departmental Graduate Studies Committee will consider the cases of those students who have failed one graduate course. Students with one failure who are allowed to proceed will have their cases reviewed by the Graduate Office. Students who find themselves in this situation are strongly encouraged to contact Accessibility Services (www.accessibility.utoronto.ca) to determine if accommodations can be put in place to meet specific needs they may have. The Graduate Office's policy is to recommend to SGS the termination of the registration of students who at any time accumulate two failing grades. Consequently, failing courses can have very severe consequences and difficulties should be addressed as soon as possible.

Students whose research work is unsatisfactory in the opinion of their supervisory committee, and/or have not completed their degree requirements after six sessions (24 months) and/or have not held an annual committee meeting, may also face termination of their registration in their graduate program. The

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committee has complete authority to recommend the termination of a student's degree program if adequate progress is not demonstrated.

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Failure to remain in good standing can affect student's eligibility for internal and external funding, registration and continuation in your program.

Please review SGS policy on Program Progress and Good Standing:

www.sgs.utoronto.ca/calendar/Pages/Good-Academic-Standing-Satisfactory-Academic-Progress-Time-Limits-Supervision-Candidacy.aspx

2.4 Seminar Requirements (BME 1010)

MHSc students are required to attend a minimum of 8 seminars, per academic year, and present their research in the second year of their studies. IBBME core, and collaborative students are required to attend a minimum of six (6) Graduate Student seminars two (2) Distinguished Seminar Series talks (BME1010Y and BME1011Y) each academic year. Any student failing to attend less than eight seminars per academic year will be considered as non-participating and will receive an *Incomplete* on their transcript, which will prevent them from graduating.

The primary goal of the IBBME Student Seminar Series is to provide practical experience and guidance in the clear, concise oral communication of research results to an audience of educated, though not specialist peers. This is an essential skill for anyone intending to seek a career in scientific research. The emphasis is different than that of a group meeting or conference style talk to a specialist audience; the emphasis here is on the skills that are important for job talks or teaching situations.

Another important goal of the series is to provide a broad knowledge of all aspects of research undertaken by other students in IBBME. Attendance at the Student Seminars is a great way to see the broad scope and reach of the graduate program at IBBME and can often offer new insight into your own research. A good, interactive audience is essential to the success of this series – so ask questions.

Please be sure to notify your supervisor and supervisory committee members as soon as you are provided with a presentation date so that they can allocate time in their schedules to attend.

2.5 Abstract Submission

Concise abstracts (~ 250 words), including the names of your supervisor and supervisory committee members must be provided prior to your seminar. These will be distributed electronically to all members of the IBBME community and posted to the IBBME web page. All speakers should email their abstracts to the Graduate Administrator by 5:00pm the Monday of the week before your seminar. Abstracts should not be over one page long.

Note:

The Graduate Office will not normally grant any exemption or allow a student to postpone her/his seminar requirement in order to protect intellectual property. Alternatives can be discussed with the Graduate Coordinator.

3. Research Thesis (RST 9999Y)

3.1 MHSc Thesis and Defense

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You should also have your proposal ready and hold your first committee meeting no later than August 31st of your first year. When nearing completion of your research you should schedule a second committee meeting to obtain approval to write your thesis. The timeline for this second committee meeting may vary due to different thesis/internship arrangements. However, the second committee meeting should occur no later than May 31st of the second year. You should leave at least two to three months to write up your thesis and prepare for your presentation for the MHSc Oral Examination.

It is highly recommended that you plan to have your oral defense by **August 31st** of your second year. The deadline for master's theses to be received at SGS for November graduation is usually the end of September. The exact date of the SGS deadline is generally announced sometime in July.

The examination committee will consist of at least 4 faculty members who bear an SGS appointment. The committee will have the following composition:

- All members of your supervisory committee;
- One independent examiner (with an SGS appointment) not associated with supervision of the project but knowledgeable in the field; and
- A chair drawn from your supervisory committee (this can be anyone from your committee except your immediate supervisor).

3.2 Committee Meetings

All graduate students with the Institute of Biomaterials and Biomedical Engineering are required to have at least one committee meeting within twelve months of registration. Annual committee meetings are required while the student remains registered.

At each meeting, the supervisory committee will assess the student's progress in the program and provide advice on future work. If after two consecutive meetings a student's supervisory committee reports that the student's progress is unsatisfactory, the Graduate Office may recommend to the School of Graduate Studies the termination of registration and eligibility of that student. A student who encounters difficulties arranging a meeting of this committee should consult the Graduate Coordinator or the Director in advance of the relevant deadline for doing so. **A student who, through his or her own neglect, fails to meet with the supervisory committee in a given year will be considered to have received an unsatisfactory progress report from the committee.**

The SGS policy on this can be found at the following page:

www.sgs.utoronto.ca/currentstudents/Pages/Maintaining-Good-Standing.aspx

Students in the Collaborative program are also required to have one committee meeting every twelve months. If your home department has a similar requirement, then please give a copy of your committee meeting report to the IBBME Graduate Office in order to fulfill the IBBME committee meeting requirement.

3.3 Supervisory Committee

Your supervisory committee is comprised of a group of professors who will assist you and your supervisor/co-supervisors in progressing through your graduate program. The members of this committee are responsible for monitoring your progress on a regular basis and must meet at **least once every twelve months** unless the committee or student elects to meet sooner. **All members of your supervisory committee must have an SGS appointment.**

Committee members are selected and invited by you and your supervisor. You are advised to confirm the SGS appointments of potential committee members. Please also refer to Section 7 of the SGS calendar for a list of professors who have full SGS appointments. Faculty with associate SGS memberships may also sit on the Supervisory Committee. However, these individuals are not listed in the SGS calendar. Committee members may be selected from departments outside of IBBME, though your supervisor must have an IBBME appointment.

Your committee shall consist of a minimum of three voting members, including your supervisor. In situations where students have more than one supervisor, two additional committee members are required for a quorum of four voting members. A simple equation to determine the minimum number of committee members required is:

$$\text{Supervisor (and co-supervisor) + two committee member (with SGS appointments)}$$

Co-supervision by more than two supervisors will not be permitted. All voting committee members must be members of the School of Graduate Studies. Students are welcome to include non-voting members in the Progress Committee but must be aware of the requirement for voting membership for the final thesis defense. Students are cautioned that large committees can become problematic for scheduling of meetings and examinations.

Satisfactory performance rating by the committee is a requirement for continued enrollment and funding in your graduate program. Committee meetings are a requirement of your graduate program and an account of the committee meeting, and its deliberations, form part of the student's official record and are reported on ACORN.

3.4 Committee Meeting Presentation and Proposal/Progress Report

The committee meeting will consist of the following:

1. A proposal/ progress report of not more than twenty pages including figures (1st meeting only);
2. A 20-minute oral presentation on the progress to date and future work (all meetings); and
3. Rounds of questions from the committee and a discussion of the thesis project.

For additional information on what to expect at the committee meeting see Appendix B.

3.4.1 Proposal/Progress Report

You are required to submit your proposal/research progress report to the members of the committee a minimum of **ten business days in advance** of the first committee meeting. The initial proposal/ progress report should include background information regarding previous research carried out in the field, what progress has been made to date with the student's research project, any results achieved, and future work to be done. Charts and figures should be included in the report. For subsequent committee meetings, you will need to ensure that your progress report addresses the concerns raised by the committee during the previous meeting (or during your PhD Qualifying Exam, if applicable).

At the meeting, you will give a 20-minute presentation where you introduce your research topic, the goals of your project, the research hypothesis (if applicable), and the research methodology/approach. You should also provide a timeline for the completion of your project. You should expect to receive critical feedback from the committee about your proposed project plan. When setting up the meeting, allot for a two-hour time period.

The critical components of a proposal are:

1. Literature review – comprehensive, critical appraisal of the relevant literature. The literature review should provide rationale for your research. For example, the literature review may identify a shortfall of previous work, a gap in the literature or an opportunity for improvement or innovation.
2. Objectives/hypotheses – these are succinct statements of your research objectives (what you plan to achieve) and hypotheses (relating to the specific questions you want to answer), in light of your literature review.
3. Methods – this section should include everything you propose to do in sufficient detail for the committee to judge its viability. This section will include different items for each proposal, depending on the nature of your thesis. Below are some suggestions (which are not intended to apply to every thesis).
 - a. For theses involving experimental work, one would usually talk about the study design, the inclusion/exclusion criteria for research participants (if humans are involved), the instrumentation to be used, the experimental protocol/data collection and the anticipated data analysis.
 - b. For theses that are about device design, one might include technical specifications/requirements, the design methodologies, the proposed design (preliminary ideas), and the criteria, analytical methods or tests for evaluating the design.
 - c. For theses that focus on modeling a phenomenon, you might include the assumptions of your model, the modeling methodologies, relevant computational tools, the proposed model (preliminary ideas), and the criteria, analytical methods or simulations for evaluating the model.

Of course, some of these items are subject to change as your project evolves. However, it is important to at least put down the tentative plan on paper. Your methods should be justified, for example, by the scientific literature or preliminary data.

4. Preliminary results that you have observed/collected

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5. Timeline – this usually takes the form of a Gantt chart or a table. It should map out all the major milestones from the first committee meeting to the completion of your thesis. You should probably include internships so the committee may gain a sense of how much time you'll be able to devote to the project at different periods of the year.
6. Bibliography – literature references cited in the body of your proposal.

Note:

Your supervisor should read over your proposal before it is submitted to the committee. In fact, you should work closely with your supervisor in developing the proposal.

3.4.2 Committee Meeting Evaluation

For every committee meeting, students prepare a committee meeting package containing the following:

1. Committee Meeting Evaluation Form → download from Quercus
2. Up-to-date transcript → print off Acorn
3. A copy of your previous Committee Evaluation report
4. Update of your completed internship requirements (i.e. percentage or total hours internship hours completed).

Submit a copy of your committee Evaluation report (PDF) onto Quercus within 48hrs of your committee meeting

3.4.3 Scheduling Your Departmental defense and oral examination

You may not proceed to schedule your final defense/ oral examination until:

1. You have completed all course and seminar requirements.
2. Your thesis has been approved by your Supervisory Committee to go forward to an oral exam.

If your thesis has not been approved to go forward as indicated on your second Committee Meeting Evaluation Form, you will be required to submit a **Request to Schedule an Oral Exam Form** signed by your Supervisory Committee to proceed to a defense. In the event that you cannot get your entire committee together to sign the form, signatures from your thesis supervisor and one other member will suffice. Submit this form on Quercus as a PDF file.

The MHSc office will prepare the oral exam paper work for you to pick up prior to your oral exam. You will need to provide the office (MHSc.ibbme@utoronto.ca) with the following information at least **ten days** before your defense

- Names of all Examination Committee members & appointed Chair (ensure external member has an SGS appointment)
- Thesis title
- Thesis abstract
- Time, date and location of your defense.

In order for the thesis to be properly appraised, students are requested to submit the thesis to the examination committee not later than two weeks before the exam. Failure to do so may result in

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cancellation of the examination.

On the basis of the thesis and the Departmental defense, the committee may recommend that:

- The thesis may be accepted as is and the candidate be awarded the degree;
- The candidate be awarded the degree subject to minor corrections of the thesis;
- The candidate be awarded the degree subject to minor modifications of the thesis;
- The candidate be given an opportunity to address shortcomings in his/her thesis or defense with the objective of a reconvened oral examination to be held at a later date;
- The candidate withdraw from the program.

Thesis Corrections

Those committee members who find the thesis acceptable must also indicate whether the thesis is acceptable as is, or requires minor corrections or minor modifications.

- Minor corrections involve typographical errors, errors in punctuation, or problems in style; they must be correctable within one month.
- Minor modifications are more than changes in style and less than major changes in the thesis. A typical example of a minor modification is clarification of textual material or the qualification of research findings or conclusions. Minor modifications must be feasibly completed within three months.

For the procedure to be followed in case of a split vote, see the explanation on the voting ballot.

Submitting your Thesis

These will be electronically archived by both the U of T Library and LAC in their secure digital repositories. These are also submitted, by SGS, to ProQuest for publication with Abstracts International.

<http://www.sgs.utoronto.ca/currentstudents/Pages/Electronic-Thesis-Submission.aspx>

3.5 Bypass examination

The bypass examination is for students in the MHSc program who wish to transfer into the PhD, therefore it constitutes a PhD Qualifying Examination. Bypass exams must be completed within 14 months from the start date of the student's MHSc program. A first Supervisory Committee meeting must be held 3-4 months before the bypass examination (during the first year). The emphasis of the examination will be on the research proposal, not on undergraduate level background. Students are expected to have completed all the appropriate course requirements by the date of the bypass examination.

3.5.1 Bypass Examination Committee

Bypass Examination Committees are made up of the PhD Supervisory Committee plus one independent examiner. Each committee must have:

1. A supervisor, and co-supervisor if applicable;
2. Two regular supervisory committee members who hold an SGS appointment;
3. An independent examiner (with an SGS appointment) not associated with supervision of the project but knowledgeable in the field

All voting committee members must hold an appointment with the School of Graduate Studies.

3.5.2 Direct Transfer (Bypass) from the BME MHSc to a PhD

Students with excellent performance may be permitted to transfer (bypass) into the PhD program, under the same supervisor, after completing not more than fourteen months of a master's degree program. Approval of transfer will be evaluated on the basis of the student's advanced research capabilities, as well as academic standing. MHSc students in the Biomedical Engineering Program who wish to transfer directly into the PhD Program and bypass the master's thesis examination are required to take a bypass examination (PhD Qualifying Examination) within fourteen months of registration. If the candidate has spent more than fourteen months in an MHSc program, they will be expected to complete their thesis at the master's level and reapply to the PhD program. Students will be considered for bypass if they have a recommendation from their Master's Committee and/or their supervisor and have maintained an A-average at the master's level.

The bypass examination will consist of the following:

1. A report detailing progress to date and providing a preliminary PhD research proposal. This report is to be thirty pages or less.
2. A 20-minute oral defense of the work to date and on the proposed research.

Assessment of the candidate will be based on the oral presentation, the written proposal, and the candidate's performance during questioning by the committee. The candidate will be expected to answer questions relative to the research proposal, the background required to undertake the work and potential applications of the research. The evaluation form is available through the Graduate Office.

3.5.3 Preparation for your Bypass Examination

You are required to submit a research proposal/report to the members of the committee a minimum of **ten business days in advance** of the examination. At the same time, you must also notify the Graduate Office (Rhonda Marley) when your examination will be held. The Graduate office will prepare a package containing documents (evaluation form + transcripts) for the Chair of your committee which you must pick up from the Office and bring to your meeting.

4. Contact Information

General Program Contact: mhsc.ibbme@utoronto.ca

Jan Andrysek, PhD, Associate Professor and Associate Director, Professional Programs
Office: MB329, (416) 978-1311; jan.andrysek@utoronto.ca

The background of the slide is a dark blue-grey color with a faint, light grey pattern of circuit board traces and circular nodes, resembling a printed circuit board (PCB) layout. The traces are thin lines that connect various circular nodes of different sizes, creating a complex network of paths across the entire page.

BME4444: Internship Guide

5. Internship Guidelines

One of the most unique and exciting components of the MHSc Program is the opportunity to acquire practical experience and knowledge through a series of internships. This Student Internship Guide contains guidelines and answers to frequently asked questions about the internship program.

If you have additional concerns or questions, please contact us a mhsc.ibbme@utoronto.ca. We will be pleased to provide any assistance or direction you may need to successfully complete your internships.

5.1 Internship Requirements

As part of BME 4444 Students are now required to complete a minimum of 625hrs (4 months of full time) internship outside of their thesis lab. The remaining 625, for a total of 1250hrs, can be completed either similarly at a company/hospital setting or at the student's thesis lab working on their own thesis. The final decision of whether a student should focus on their thesis or seek an internship outside the lab, lays in the student's hands, however is contingent on the supervisor's ability to provide funding. Funding is typically \$10,000 in lieu of 4-months of internship funding. Open communication between the student and supervisor is highly encouraged.

5.2 Obtaining an Internship

The Professional programs office actively provides information to MHSc students about available internship positions on a continual basis through emails and by updating the database of current and previous internship placements on Quercus. Students are expected to use this information and these resources to proactively seek their own internship opportunities. While the internships are mandatory, there is no guarantee that the Professional programs office will be able to provide internships to every student.

5.3 Appropriate internships

While there is considerable flexibility as to the types of internships a student can take, the internship needs to be relevant to clinical engineering, and as such should include significant aspects of work pertaining to engineering/technical work in a clinical/medical setting. The internship opportunities provided by our office (i.e. our databased on Quercus or circulated postings) will be approved as appropriate. You do not need to seek approval for these prior to applying. However, if you find a new internship opportunity on your own that has not previously been approved by IBBME, or if you are unsure if a particular position is appropriate, fill in a New Internship Proposal form and submit it on Quercus. Approval should be sought prior to accepting or commencing with the internship. Student who submit a proposal form are still required to fill an agreement form.

5.4 Internship Reports

Submission of the reports below via Quercus is required. A student's final mark will either be an average of both internships, if only one internship is completed, that mark will be used. Submission of internship reports is only required for the first 625 hours.

All reports below should be submitted as PDF files via Quercus. Please name files using the following nomenclature:

'Last name_ First name_Report name_ Internship #'
e.g.: Bloch_Jenia_AgreementForm_1

5.4.1 Internship agreement form (5%)

This is an initial form detailing information regarding the position, supervisor and the project's goals. The form ought to be signed by both the student and their supervisor. It is available on and should be submitted on Quercus no later than 2 weeks following the first day of the internship.

5.4.2 Hour reporting (5%)

Reporting of hours completed should be submitted on a **monthly** basis. Using a digital form on Quercus. Indicate the total hours worked to date when filling in the form.

5.4.3 Interim Internship Report (10%)

To be completed midway through the internship. The goal of the form is to evaluate the goals achieved to date and method applied. The form is found and should be submitted in Quercus.

5.4.4 Internship Final Report (40%)

Upon completion of an internship, students are required to write a report summarizing their experience. The report should be no more than 5 pages (double-spaced).

The report should include the following sections/information:

1. A title page, including student name, student number, name of company, submission date and start and end date of internship
2. Objectives of the internship
3. Key knowledge/skills acquired (e.g. specific technology or management practices)
4. Relevance of the internship to the clinical engineering profession
5. A list of student contributions

The report should be submitted as a PDF on Quercus within two weeks of completing the internship.

5.4.5 Supervisor Evaluation (40%)

Prior to the completion of your internship, download the supervisor evaluation form on Quercus and ask your supervisor/s to fill out an evaluation of the student's work at the completion of the internship. The assessment of a student's work may take into account the following performance indicators:

- Quality of work/research completed
- Management of assigned tasks
- Cooperation/team work/interpersonal skills
- Professional demeanor
- Reliability/punctuality
- Willingness to learn

5.5 Internship Grading Policy

All assignments/ reports are found and should be submitted as PDF files on Quercus.

Evaluation breakdown:

Internship agreement form	5%
Hour reporting	5%
Interim report	10%
Final Report	40%
Supervisor evaluation	40%

The final grade for BME4444Y will be the average of the grades from each individual internship, unless the student has undertaken only one internship. Student may also opt not to submit reports past 625 hours of work. If a student opts to work on their thesis in –lieu of an industry/hospital based placement, there is no need to submit internship reports.

5.6 Internship Placement Fee

There is a one-time internship placement fee, payable before the start of your first internship. Please see the IBBME website (<https://ibbme.utoronto.ca/prospective-students/master-of-health-science-mhsc/>) or contact the graduate office for details.

6. Appendices

6.1 Appendix A: General information

Supervision: What you should expect

The University has recently undertaken an initiative to assist students in receiving strong supervision during their graduate degree. You should be sure that you are familiar with the SGS guidelines for Graduate Supervision. www.sgs.utoronto.ca/Documents/Supervision+Guidelines.pdf

Safety

It is mandatory for all registered students to attend the Health & Safety Training course at the beginning of the program, and take the WHMIS refresher course annually thereafter. You will be prohibited from starting your research until this requirement is completed. This is in addition to any safety sessions you may be required to undertake at your lab's physical location. You should be aware of your responsibility under the Safety Act, which governs safety in the workplace in Ontario. You should also be aware of the Biohazard, Laser, and Radiation protocols particular to your research and research environment.

Ethics

All of the research undertaken in IBBME is covered under several ethical review programs. You must be aware of guidelines on Research Involving Human Subjects and attend ethics courses as required. <http://www.sgs.utoronto.ca/facultyandstaff/Pages/Research-Involving-Human-Subjects.aspx>

Intellectual Property and the Graduate Student

Students must be aware of the issues around Intellectual Property and their research. Please refer to the Faculty of Medicine (www.facmed.utoronto.ca) and the SGS websites (www.sgs.utoronto.ca) for updates and guidelines.

Plagiarism and other Cases of Academic Misconduct

Students in graduate studies are expected to commit to the highest standards of integrity and to understand the importance of protecting and acknowledging intellectual property.

The University's policy on academic misconduct is found in the *Code of Behaviour on Academic Matters* can be found on the SGS website under Information for Students. It is the student's responsibility to be aware of these policies. In particular, make sure you know exactly what is considered plagiarisms in the context of your progress reports, proposal, manuscripts and thesis and how to avoid it (<http://advice.writing.utoronto.ca/using-sources/how-not-to-plagiarize/>).

<http://www.sgs.utoronto.ca/facultyandstaff/Pages/Academic-Integrity.aspx>

Transfer to Other Programs

Transfer to/from another Department:

Students who wish to transfer from another department after registration must obtain necessary approvals from his or her supervisor(s) as well as the Graduate Coordinators from the departments.

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Transfers will normally not be permitted after one year of registration in a program. If a new research supervisor is being selected, the supervisor must be a full member of the School of Graduate Studies. A letter of acceptance is also required from the supervisor accepting the student into his/her research lab and financial responsibility.

Change of Primary supervisor

In exceptional circumstances, a student may wish to change his/her primary supervisor. In such a case, the student should discuss this plan with the Graduate Coordinator so that all pros and cons and all other possible other alternatives have been considered. Normally, the Graduate Office will give the student a defined, but limited, period of time to identify a new supervisor (who may be from within or outside of IBBME). In addition, a student can decide to take a one semester standard leave of absence during that period, if eligible. Note that it is ultimately the responsibility of the student to identify and establish a relationship with their intended research supervisor; the student may request some assistance from the Graduate Office during this process but the Graduate Office cannot simply transfer a student from one supervisor to another. Therefore, a change of supervision should be attempted only when there are no other alternatives since there is no guarantee that it will be possible.

If the student unilaterally decides to stop working with his/her current supervisor and a new supervisor cannot be identified during the time period prescribed by the Graduate Coordinator, then the Graduate Office may recommend that the student consider withdrawing from his/her graduate program in IBBME (see Section 8.8) as graduate students must have a supervisor in order to meet the requirements of their program. (<http://www.sgs.utoronto.ca/Documents/Supervision+Guidelines.pdf>)

Program Withdrawal and Termination of Registration

The Graduate Office may request to SGS the termination of the registration of students who have failed two or more graduate courses, or have failed two attempts at their PhD Qualifying Examination or have showed a lack of research progress in two subsequent committee meetings. Normally, the Graduate Office will give student the chance to voluntarily withdraw from the program within a defined time period before the request for termination is formalized with SGS (a termination status can have serious consequences as it is permanently recorded on student transcripts). However, it is important to note that termination can be appealed to the Graduate Academic Appeals Board of SGS but that withdrawal cannot. Students in this situation are encouraged to obtain additional information about appeals and withdrawals from SGS in order to make their decision.

<http://www.sgs.utoronto.ca/facultyandstaff/Pages/Termination-Student-Info.aspx>

Change of Address

Students are responsible for updating any address and/or telephone changes via the Student Web Services <http://help.acorn.utoronto.ca/how-to/>. In addition, students should also inform the Graduate Office and the Administrative Office in writing. We will make the necessary changes in the payroll system.

Office Space and Keys

Office or desk space is usually assigned to students upon registration. Inquiries related to office space allocation should be directed to the Operations Assistant. IBBME students who require keys for their offices or laboratories should contact the IBBME Administrative Office, Room 407 of the Rosebrugh Building.

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Mailboxes

There is one mailbox located in Room 407 of the Rosebrugh Building for any personal mail that may arrive for students.

Student Cards and E-mail Address

The U of T [TCard](#) is an access card for services on campus. Email service, wireless network, and access to the [Learning Portal](#) will be available upon receipt of your TCard and authentication of your UTORid. You may obtain your TCard at any one of the three campus locations. Check out [TCard News](#) for dates when you are eligible to pick up your TCard.

Proof of citizenship, identification and your offer of admission letter or student number are required in order to receive a TCard. For detailed information about the documentation required to obtain a TCard, visit <http://tcard.utoronto.ca>

Before arrival on campus, you can use your JOINid to access your student account on ACORN to update contact information. Upon receipt of your TCard, you will be given a Secret Activation Key to promote your JOINid to a fully valid UTORid.

Your email account at U of T is associated with your UTORid. It is important to activate your UTORid to receive communications from U of T, SGS, and the Graduate Awards Office.

See also: [UTmail+](#), an email and calendaring service for students and alumni.

Your University of Toronto email address is the official contact point for all University-related announcements and notices posted by the School of Graduate Studies and your Graduate Unit. Please note that, for security purposes, Faculty and Graduate Offices are prohibited from opening emails that do not come from a University of Toronto account. You are responsible for ensuring that this account is checked regularly.

Payroll

Students registered in the Biomedical Engineering Program or the Clinical Engineering Program should direct all payroll inquiries to the IBBME Administrative Office; Collaborative students should contact their home department's business officer for information.

Leaves of Absence and Student Personal Time Off

Guidelines on Leaves of Absence (<http://www.sgs.utoronto.ca/calendar/Pages/Registration-and-Enrolment.aspx>)

Graduate students whose programs require continuous registration may apply to their Graduate Coordinator for a one-session to three-session leave during their program of study for:

1. **Serious health or personal problems** which temporarily make it impossible to continue in the program;
- or

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2. **Parental leave** by either parent at the time of pregnancy, birth or adoption, and/or to provide full-time care during the child's first year. Parental leave must be completed within 12 months of the date of birth or custody. Where both parents are graduate students taking leave, the combined total number of sessions may not exceed four.

Once on leave, students will not be registered, nor will they be required to pay fees for this period. In general, students on leave may not make demands upon the resources of the university, attend courses, or expect advice from their supervisor. As an exception, students on leave for parental or serious health reasons who wish to consult with their supervisor or other faculty are advised to make special arrangements through their department. Students on leave will not be eligible to receive University of Toronto financial assistance. In the case of other graduate student awards, the regulations of the particular granting agency apply.

Students may make application for a leave by completing the leave of absence form (<http://www.sgs.utoronto.ca/Documents/Leave+of+Absence.pdf>) and submitting it to the IBBME Graduate Office for approval. The form is then sent to the School of Graduate Studies for processing. The termination date of the degree program will be extended by the duration of the leave taken, i.e., one, two, or three sessions as appropriate. Except for parental leave or in exceptional circumstances, it is not expected that a student will be granted more than one leave under the terms of this policy. Normally the start and finish of the leave would coincide with the start and end of a session.

Guidelines on Personal Time Off

It is recognized that many graduate students conduct their research almost exclusively within a laboratory setting, where they may or may not have control over their hours and the flow of the research program. Students are not employees and therefore have no rights to employee benefits, including paid vacation entitlement. However, it is recognized that in order for a graduate student to reach their full potential and achieve academic excellence and maintain a healthy work/life balance, they benefit from some personal time off or vacation. There are SGS policies and procedures in place for students who require a leave of absence for parental, personal or medical reasons. However, there are no University or SGS policies regarding graduate student personal time off or vacation. The following guidelines for faculty and graduate students provide a framework for reasonable expectations. As a general rule, students might reasonably expect up to three weeks (fifteen working days) per year in personal time off, plus statutory holidays, under the following conditions:

- Time off provisions should be negotiated, in a clear and transparent manner, between the supervisor and the graduate student.
- Time off should not compromise the research program and/or the student's graduate studies. Students must ensure that laboratory work, experimentation and other time-sensitive activities are either completed, or arrangements made for others to continue ongoing work.
- Consideration should be given to when the building or lab is closed (i.e. winter holidays) when taking time off.
- Time sensitive deadlines (i.e. award applications, abstract submissions) must be taken into consideration.
- Time off cannot be carried forward from year to year.
- Time off should be requested as far in advance as possible.

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- The student and supervisor should be able to maintain contact as appropriate if the student is away for an extended period.
- Given that students receive remuneration as a stipend, not salary, the stipend continues, unaffected by personal time off.
- Attendance at social activities within the academic community (departmental picnic, etc.) or scientific meetings do not fall under the category of personal time off.
- Sick leaves or absences for health reasons must be documented and do not fall under category of personal time off.

Graduate Course Grade Scales

The Table below presents the grade scale for graduate courses. IBBME requires the completion of every course taken for graduate credit with a least a mark of B- (or 70%). However, eligibility for most graduate scholarships requires a GPA of at least A-. A grade below 70% is inadequate and indicated on the transcript by FZ (fail) and cannot be counted for credit. A student who has received an FZ in a course should speak with the Graduate Coordinator to get the permission to either repeat the course or substitute another one. This permission may be given to the student if his/her marks in other course(s) taken is/are above the minimum required. Normally, a student will not receive this permission more than once. If a student fails two courses, the Graduate Office will recommend to SGS termination of student's registration in the program.

<http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/grading.pdf>

<i>Graduate</i>	
Truncated Refined Letter Grade Scale	Numerical Scale of Marks
A+	90 - 100%
A	85 - 89%
A-	80 - 84%
B+	77 - 79%
B	73 - 76%
B-	70 - 72%
FZ**	0 - 69%

**FZ = Fail

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General information on scholarship options:

CGS M (NSERC, CIHR)	Website: Deadline: Application:	http://www.nserc-crsng.gc.ca/students-etudiants/pg-cs/cgsm-bescm_eng.asp Deadline mid/late Fall Must be submitted to the Graduate Office.
NSERC PGS D NSERC CGS D		http://www.nserc-crsng.gc.ca/Students-Etudiants/PG-CS/BellandPostgrad-BelletSuperieures_eng.asp Deadline early Fall Must be submitted to the Graduate Office.
OGS	Website: Deadline: Application:	http://www.sgs.utoronto.ca/currentstudents/Pages/Ontario-Graduate-Scholarship.aspx Students will be notified Deadline is usually spring. Must be submitted to the Graduate Office.
QEII-GSST	Deadline: Application:	April – May of each year. Students will be notified as it becomes available.
IBBME International Fellowship Award	Deadline: Internal:	A maximum of two new awards are made to the incoming class. Only International PhD students are eligible to apply. On-going support through this program will be contingent on demonstrated performance in research and eligibility and availability of funds. Deadline for applications is May 1 st and should be submitted by the supervisor.
FOM OSOTF and Other Endowed Awards		http://graduate-awards.knowledge4you.ca/graduateawards/awards.cfm Deadline spring Application submitted directly to Faculty of Medicine
CIHR CGS D	Website: Deadline: Application:	https://www.researchnet-recherchenet.ca/rnr16/vwOpprntnyDtIs.do?prog=2097&view=currentOpps&type=EXACT&resultCount=25&sort=program&all=1&masterList=true Deadline Early Fall Application must be submitted to the Graduate Office

Teaching assistantships

A limited number of Teaching Assistantship positions are also available to students who are officially registered in degree program at the University. Information about the available positions is usually posted approximately one to two months prior to the beginning of each term on the IBBME website. All terms and conditions of employment are set out in the Collective Agreement between the Canadian Union Public Employees (CUPE Local 3902) and the Governing Council of the University of Toronto.

Policy on Extension and Late Withdrawal Requests for Graduate Courses

A request for an Extension in a graduate course should be sent to the Instructor **within two business days after deadline** for completing that particular component of the course. The request must be supported by medical documentation (see <http://www.illnessverification.utoronto.ca>), if the reason for the request is due to an illness.

If the extension required for the completion of the coursework is beyond the original SGS deadline to submit the marks for that course (e.g. past the end of the session) then the request will have to be sent to the Graduate Office. Students will petition the graduate unit for extensions, using a standard form provided by SGS (<http://www.sgs.utoronto.ca/Documents/Extension+to+Complete+Coursework.pdf>).

We strongly recommend that students request an extension instead of a late withdrawal for course whenever applicable. A request for a late withdrawal for a course should be sent to the Graduate Office as soon as possible during the session in which the course is offered. Such requests are approved only for exceptional circumstances such as a very serious illness or bereavement. These requests must be supported by appropriate medical documentation (<http://www.illnessverification.utoronto.ca>), if the reason for the late withdrawal is due to a medical condition. The Graduate Office is not likely to approve a request for a late withdrawal after the final course marks have been communicated to the students.

<http://www.sgs.utoronto.ca/calendar/Pages/Registration-and-Enrolment.aspx>

Requests for Extensions or Late Withdrawals may be granted or denied by the Graduate Office. In the case of an extension, if the course is never completed by the deadline prescribed by the Graduate Office, then the report of INC (incomplete) is permanently recorded on the student's transcript.

Academic Appeals (for a course mark, course failure or other academic decisions)

Note that decisions made by Instructors, Supervisors, Supervisory Committees and the Graduate Office can be appealed. Academic appeals are initiated within IBBME (with the exception of appeals related to Termination of Registration and Final Oral Examination failure which are appealed directly at the SGS level). When possible, the Graduate Office or the Director will provide assistance to attempt to settle the appeals informally between the parties involved (e.g. student, instructor, supervisor, supervisory committee).

If a student wants to appeal a decision made by the Graduate Office, the first step in the process is to send a notice of appeal (<http://www.sgs.utoronto.ca/Documents/GDAAC+Notice+of+Appeal.pdf>) to the Professor chairing IBBME's Graduate Department Academic Appeals Committee (GDAAC). The GDAAC will review the case and will make a recommendation to IBBME's Director (or his/her substitute) who then makes a decision. The appeal can then subsequently be taken to the Graduate Academic Appeals Board (GAAB) of SGS, and then to the Academic Appeal Committee of the Governing Council of the University.

<http://www.sgs.utoronto.ca/facultyandstaff/Pages/Graduate-Academic-Appeals.aspx>

<http://www.sgs.utoronto.ca/calendar/Pages/Academic-Appeals-Policy.aspx>

BESA (BioEngineering Student Association)

BESA represents and promotes the student community at the Institute. They organize many of the social events for our students, and are quite busy listening to students expressing their views, ideas, or concerns related to any matters. Further information about BESA can be found at <http://besa.ibbme.utoronto.ca>.

The Essential Grad Guide

The Essential Grad Guide is a booklet for new students that contains information about registration and services offered by SGS and the University of Toronto. The electronic copy of the booklet is posted on the SGS website.

6.2 Appendix B: Committee Meeting Information

What Happens at Committee Meetings

The general meeting agenda is as follows:

- You will be asked to leave the room for a few minutes. The committee will review your file and discuss any concerns.
- You will be invited back into the room and will be asked to give a 20-minute presentation of your proposed research.
- The committee will usually go through two rounds of questions/comments/suggestions. You respond to questions/suggestions as appropriate.
- You will be asked to leave the room. The committee fills out the standard IBBME Thesis Committee Meeting Evaluation Form, which includes an evaluation of your progress, strengths, weaknesses, etc.
- You will be invited back into the room and the committee will depart. Your supervisor will relay the committee's comments/suggestions to you.
- Once the committee evaluation form has been completed, you sign the document. It is your responsibility to make a copy for yourself and upload a copy onto Quercus, within 48hrs. The form will be added to your file and recorded on ACORN.

If the progress of a student is deemed "unsatisfactory" by the committee, the Graduate Coordinator will discuss the situation with the student and the student's supervisor.

Scheduling Committee Meetings

You will need about a month to organize a committee meeting. It is your responsibility to arrange your meetings. The necessary steps are listed below.

- Find a day and time that is suitable for your supervisor and committee members.
- Book a seminar room. You may choose to use IBBME Library located in Room 407, Rosebrugh Building. This can be done either with the Graduate Office or the CE Office, whichever is appropriate. This must be done at least two weeks in advance. **You may request to book a room only if all the committee members have confirmed their availability to attend.**
- Assemble a Committee Meeting package which includes: 1) Committee Evaluation Form, 2) up-to-date transcript, and 3) a copy of your previous Committee Evaluation Form.

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- Finally, send a confirmatory email to your supervisor and committee members. It is often useful to send a reminder to your supervisor and committee members at least one week in advance.

Following your Committee Meeting

- Scan your Committee Evaluation form and upload it onto Quercus within 48hrs of your meeting
- Keep a copy of the original document

Meeting Type	Timeline	Committee Composition
Committee Meeting	Minimum of once every 12 months for Master's and PhD, including Collaborative Program participants. 1 st PhD supervisory committee meeting should be after 8 months from start, 3-4 months before PhD Qualifying Exam	3 Members: Supervisor + 2 SGS Appointed Members
Master's Bypass Exam	Within the first 12 – 14 months of the Master's program	4 Members: Supervisor + 2 Regular Members of the Supervisor Committee + 1 External Member
PhD Qualifying Exam	To be completed within 14 months of initial registration in the PhD program for direct admits	4 Members: Supervisor + 2 Regular Members of the Supervisor Committee + 1 External Member
Master's Defense	The Master's should be defended within 2 years of initial registration	4 Members: Supervisor + 2 Regular Members of the Supervisor Committee + 1 External Member
PhD Departmental Defense	Should be held within 3-4 years of the PhD program (direct admit) or 5 years for those who bypassed to the PhD from the master's	4 Members: Supervisor + 2 Regular Members of the Supervisor Committee + 1 External Member
PhD Final Oral Exam	Following a PhD Departmental Defense	4-5 Members: Supervisor + 1 or 2 Regular Members of the Supervisor Committee + 1 Internal Member (the External Member from the Departmental Defense) + External Member (usually the External Appraiser)

Note: Should a student have a Supervisor and a Co-Supervisor, the minimum number of committee members will increase by one. Should any clarification be needed, please contact the IBBME Graduate Office.

6.3 Appendix C: Thesis structure

Each degree candidate must present a thesis and pass an oral examination relating to their research.

Thesis Structure

A thesis generally contains the following components. Chapter titles and content may vary depending on the nature of the thesis.

Title Page: The title should precisely describe what the thesis is about. The most important key words that you think describe your research should appear in the title.

Abstract: This is usually one page in length, presenting the research problem, the main results, conclusion and how your thesis advances the field.

Acknowledgements: You may acknowledge funding agencies, supervisors, committee members, lab mates and anyone else you feel who was instrumental to the completion of your thesis.

Table of contents: List of chapters and sections.

A list of figures: A list of figures should be provided with specific page numbers.

A list of tables: A list of tables should be provided with specific page numbers.

A list of abbreviations: A list of all abbreviations used in the thesis and their explanations should be provided.

A list of equations: A list of equations as necessary with specific page numbers.

A list of foundations and funding sources: A list of all foundations that have contributed to the achievement of the final thesis.

Introduction: Usually this chapter includes the following:

- The area of research;
- The practical and theoretical value of the topic;
- Your research problem and why this was worthwhile studying;
- The objective of the thesis: how far you had hoped to advance knowledge in the field;
- The research method in brief; and
- A roadmap of the thesis - A paragraph about each chapter. What is the main contribution of the chapter? How do they relate to each other?

Statement of the problem and hypothesis: An explicit description of the analyzed problem and hypothesis

Related literature: A survey of the literature (theories, concepts and previous work) on the areas that are most relevant to your research question. This chapter should critically appraise the previous research area that you wanted to develop further or challenge.

Research method or design: This chapter details the research method by which you investigated the problem under study. This is essentially an updated version of the Methods outlined in your thesis proposal and should basically provide a detailed description of how you actually carried out your research.

Results: This chapter presents the data collected or the outcome of experiments or simulations.

Discussion: This chapter interprets and discusses the research findings, their relevance to the field, their relationship to published literature or their clinical implications (if any).

Conclusion: This closing chapter provides a recap of the problem, the main findings and the discussion including the comparison with the literature presented. It is also recommended that you include an enumerated list of your perceived contributions to the field. You may also suggest future research directions.

References: The references should be properly formatted according to a standard reference style (e.g., APA) and includes books, journal articles, monographs, dissertations and other publications.

Please consult the SGS Guidelines for Preparation of Theses at <http://www.sgs.utoronto.ca/currentstudents/Pages/Formatting.aspx> for the appropriate formatting of your thesis.

<http://advice.writing.utoronto.ca/using-sources/how-not-to-plagiarize/>

6.4 Appendix D: University of Toronto Fully Affiliated Teaching Hospitals

1. Holland Bloorview Kids Rehabilitation Hospital
2. Centre for Addiction & Mental Health Rehabilitation
3. Hospital for Sick Children
4. Mount Sinai Hospital
5. St. Michael's Hospital
6. Sunnybrook Health Sciences Centre
7. Toronto Baycrest Centre for Geriatric Care
8. University Health Network (including Toronto General Hospital, Toronto Western Hospital, Toronto Rehabilitation Institute, and Princess Margaret Hospital)
9. Women's College Hospital

6.5 Appendix E: Collaborating Departments

Biochemistry – <http://biochemistry.utoronto.ca/>

Department of Chemistry – <http://www.chem.utoronto.ca>

Chemical Engineering and Applied Chemistry – <http://www.chem-eng.utoronto.ca>

Dentistry – <https://www.dentistry.utoronto.ca/>

Electrical and Computer Engineering – <http://www.ece.utoronto.ca>

Laboratory Medicine and Pathobiology – <http://www.lmp.utoronto.ca/>

Materials Science and Engineering – <http://www.mse.utoronto.ca>

Mechanical and Industrial Engineering – <http://www.mie.utoronto.ca>

Medical Biophysics – <http://medbio.utoronto.ca/>

Institute of Medical Science – <http://www.ims.utoronto.ca/>

Pharmaceutical Sciences – <http://pharmacy.utoronto.ca>

Physics – <http://www.physics.utoronto.ca>

Physiology – <http://www.physiology.utoronto.ca/>

Rehabilitation Science – <http://www.gdrs.utoronto.ca/>

6.6 Appendix F: Graduate Course Descriptions

IBBME Course descriptions: <https://ibbme.utoronto.ca/current-students/course-calendar/course-descriptions/>

Current year course offerings: <https://ibbme.utoronto.ca/current-students/course-calendar/>

**Note: Not all courses are offered in a given year*

6.7 Appendix G: Examples of Course alternatives (non BME courses)

Theme area: Tissue Engineering, Biomaterials and Regenerative Medicine

MSC7000Y Regenerative Medicine

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JTC1331H	Biomaterials Science.
JNR1444Y	Neuroscience
CHE1310	Chemical Properties of Polymers
PSL1040H	Systems biology in physiology
ECE1656H	Non linear modeling and analysis of biological systems
DEN1080Y	Biology of Connective Tissues
DEN1081H	Bone Interfacing Implants
MSC3001H	Foundations in Musculoskeletal Science
JNR1444Y	Fundamentals of Neuroscience: Cellular and Molecular (very advanced)
PSL1441H	Systems Level Neuroplasticity
PSL1445H	Mechanistic Molecular & Cellular Neuroscience
PSL1452H	Fundamentals of Ion Channel Function
PSL1462H	Molecular Aspects of Cardiovascular Function (**has prerequisite therefore some students may not be eligible**)
JYG1555H	Advanced Topics – Cell and Molecular Neurobiology
JCV1060H	Developmental Cardiovascular Physiology
JCV3060H	Advanced Topics in Cardiovascular Science: Molecular Biology and Heart Signal Transduction
JCV3062H	Advanced Topics in Cardiovascular Science: Heart Function
JCV3063H	Advanced Topics in Cardiovascular Science: Vascular

Theme area: Nanotechnology, Molecular Imaging and Systems biology

PHY2701	Biological Physics
PHY2703	Molecular Biophysics
PHY2703	Cellular Biophysics
PHY2704	Cellular Dynamics

Theme area: Neural, Sensory systems, Rehab

JNS1000Y	Fundamentals of Neuroscience: Systems and Behaviour
CSC 2515	Introduction to machine learning
CSC2535	Advanced machine learning (usually after CSC2515 but not necessarily)
PSY5110HS	Rhythms of the Brain in Cognition and Pathologies
REH 1120H	Research methods for rehabilitation science
PSY5123HF	Cognitive Rehabilitation
REH 1510H	Disordered and restorative motor control
MIE 1807J	Principles of measurements

Theme area: Engineering in a clinical setting

CSC 2514H	Human-Computer Interaction
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INF 1230H	Management of Information Organizations
INF 1341H	Analyzing Information Systems
INF 1342H	Designing Information Systems
INF 1343H	Data Modeling and Database Design
INF 2149H	Administrative Decision-Making in Information Organizations
INF 2150H	Advanced Management of Information Organizations
INF 2164H	Authority and Credibility in Online Communications
INF 2169H	User-Centered Information Systems Development
2183H	Knowledge Management and Systems
INF 2241H	Critical Making: Information Studies, Social Values and Physical Computing
KMD1001	KMD: Fundamental Concepts
KMD1002	KMD: Contexts and Practice
KMD2001	Human-Centered Design
KMD2002	Technologies for Knowledge Media
	KMD2003
	Technology in Education: Philosophical Issues
KMD2004	Knowledge Media, Culture & Society
	KMD4000
	Special Topics in KMD
MIE 1402H	Experimental Methods in Human Factors Research
MIE 1403H	Analytical Methods in Human Factors Research
1407H	Engineering Psychology and Human Performance
1411H	Design of Work Places
MIE 1412H	Human-Automation Interaction
	MIE1413H
	Statistical Models in Empirical Research
MIE1414H	Human Factors in Transportation
MIE1415H	Analysis and Design of Cognitive Work
MIE542H1	Human Factors Integration
MIE1616H	Research Topics in Healthcare Engineering
MSL 2325H	Museums and New Media Practice
SOC 6312H	Social Aspects of Technology and Work
6501H	Research Design and Hypothesis Testing

6.8 Appendix H: Internship Frequently Asked Questions

Q: Am I guaranteed an internship position?

A: The Program Office will do their utmost to assist you in securing a suitable internship placement. Much of the success in securing a position depends upon your particular skills and efforts, your ability to "sell" yourself in an interview and current employer demands in the marketplace. No guarantees can be given but our students have a proven track record of finding good internship positions.

Q: If I am offered a position do I have to accept it and can I change my mind?

A: You have 5 business days to accept or decline an offer unless otherwise specified by the employer. To be fair to employers who have invested time and energy in our program, you may only decline 2 internship offers per semester with adequate reason. In general, the only reason will be the acceptance of another internship offer valid within the same 5 business days. This guideline has been devised such that your fellow students who may be competing for the same positions do not have to wait indefinitely for your decision. In light of the above, we strongly advise that you only apply to positions in which you are genuinely interested.

You *cannot* withdraw your acceptance of a position to accept another position, unless you received approval to do so from the Director of the program.

Q: Can I go for other interviews or accept other offers after I have accepted an offer?

A: To be fair to employers and to your fellow students, as soon as you have accepted an offer you should withdraw from the internship competition process.

Q: How much am I expected to be paid for the internship?

A: Typical internship compensation ranges from \$16 to \$20 per hour. Keep in mind that the internship primarily provides opportunities to gain practical skills and training in a real clinical environment. Occasionally students wish to take an unpaid internship. In such a case they are required to complete the Full Funding Waiver form.

Q: Is there any government funding for the internship?

A: Yes, if your internship involves an Ontario company you may be able to receive funding through the Mitacs Accelerate program. It is a unique program which funds short-term, applied internship research projects *in any faculty or discipline* involving a faculty member, a graduate student and an Ontario company. The intern receives approximately \$10,000 as a stipend for a four-month internship. Applications need to be submitted months prior to the start of the internship. There are also matching fund programs. For detailed information please refer to the Mitacs *Accelerate Canada* [website](#).

Q: Am I allowed to combine my thesis project with my internship and how?

A: Yes, you may choose to focus on your thesis rather than take on a second internship after you have completed 625 hours working outside the lab.

Q: May I find my own internship?

A: Yes, you absolutely may do so. However, each position needs to be approved in advance by the program coordinator to ensure that it meets the objectives of the Clinical Engineering Program. To

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propose an internship that you have found yourself, or if you are unsure whether a particular internship is appropriate, you should submit an Internship Proposal form.

Q: Do I need to pay the internship placement fee even if I find my own internship?

A: Yes, you must still pay the internship placement fee, even if you find your own internship. The fee covers the costs of all administrative support related to internship, not just the finding of the internships.

Q: Do I need to pay the internship placement fee if I undertake an unpaid internship?

A: Yes, you must still pay the internship placement fee even if you undertake an unpaid internship. The administrative work remains the same, regardless of remuneration to the student.

Q: What if I don't like my job after I start?

A: If you do not like your job or have any concerns or problems, you must contact the program director immediately to discuss the situation. Do not take any impulsive action without consulting with the program coordinator.

Q: What if I don't find an internship position?

A: Completing 625 internship hours is part of the degree requirement. Please consult with the program coordinator or program assistant if you are concerned about your internship prospects.