Institute of Biomedical Engineering

Student Handbook

RESEARCH PROGRAMS 2022-23

WELCOME

On behalf of the faculty and staff of the Institute of Biomedical Engineering (BME), we would like to extend a warm welcome to you. The purpose of the BME graduate student handbook is to provide a quick reference of BME activities and policies. We look forward to assisting you throughout your graduate experience.

Sincerely,

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1.0 REGISTRATION POLICIES AND PROCEDURES

1.1 Full-time studies

Students registered as full-time students in the School of Graduate Studies (SGS) must be engaged in their studies on a full-time basis, as required by government regulations for full-time graduate studies. All students are required to register annually on a full-time basis until all degree requirements are completed. According to government regulations, full-time graduate students must:

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

A full-time student may be absent from the university for an extended period or may participate in a program offered by another university if, and only if, the student has received written permission from the graduate unit in which he or she is registered. A graduate student who, in a given session, is absent from the university without receiving prior approval may lose good academic standing. In exceptional cases, a graduate unit may recommend to SGS the termination of the student's registration and eligibility.

1.2 Program registration

Registration is the process by which a person establishes an active association with a program of study for an academic period. Students must register annually, in September, for each year of the program. A student is registered once any conditions of admission have been satisfied and academic, incidental, and ancillary fees are paid, or a fees arrangement has been made. In addition to tuition, students are also charged compulsory fees for incidentals and ancillary services. Fees are determined by the program of study, and fee payment is required for registration whether the student attends class or not. The student is responsible for paying fees in full before the registration deadline. Failure to register will cause the student's candidacy status to lapse.

Learn more online →

1.3 Admission conditions

Admission conditions enable BME to offer admission, and in some cases even allow registration, conditional upon satisfying some outstanding admission requirement(s) such as conferral of admitting degree. To clear all conditional offers of admission, new students must request that official transcript(s) reflecting final grades and evidence of degree conferral be sent to BME from the issuing institution(s). Digital documents must be sent to grad.bme@utoronto.ca Digital/electronic transcripts are acceptable and preferred over hard copies.

1.4 Late registration

1.4.1 Late fees

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

1.4.2 Financial cancellation

Students who missed the SGS registration deadline (e.g., did not make a minimum fee payment) will have their registration financially cancelled (FINCA). Cancelled students are automatically removed from enrolled course(s). The student is responsible for resolving FINCA status. After registration is restored, it is the student's responsibility to re-enroll in courses. Moreover, students with teaching assistantships must be registered to retain eligibility for teaching assignments.

1.5 Fee payments

1.5.1 Direct payment (i.e., pay now)

The student's invoice is available on ACORN. It can take up to two weeks for payments made at the bank to be processed. Payment is considered made on the date it is applied to the fees, not the date the payment is made at the bank. Plan and allow sufficient time for payment.

1.5.1.1 How to make a payment

Learn how to navigate the student dashboard, including how to pay your fees, by visiting https://help.acorn.utoronto.ca/how-to and reviewing the "Finances" section. For more payment options, please view instructions for "Making Payments" at https://studentaccount.utoronto.ca.

1.5.2 Deferred payment (i.e., pay later)

Fee deferrals allow students to register for the academic year without having to make a payment toward their fees. If approved, fees are deferred until April 30 of the relevant academic year. Although not required, students are still eligible to make payments toward fees during the deferral period. Interest is charged on any outstanding balance as of May 17, and the full balance must be paid by August for subsequent registration. Students will not be permitted to register for the next academic year if there is an outstanding balance owed (arrears).

1.5.2.1 Deferral eligibility

Students may be eligible for fee deferral if they satisfy specific conditions outlined by The Student Accounts Office: https://studentaccount.utoronto.ca/acorn-billing-student-information/tuition-fee-deferral/

1.5.2.2 How to defer payment

Option 1: Self-service on ACORN. Students receiving the guaranteed minimum stipend can defer tuition fees in ACORN.

Option 2: Submit a fee deferral form. This deferral can be requested if the student has proof of external funding (i.e., major award) that exceeds the Minimum Payment to the Register. A student can submit the Register Without Payment (fee deferral) form to the BME Graduate Office.

1.5.2.3 Deferral option summary table:

Guaranteed stipend holder	Major award holder	May defer fees	Procedure
Yes	Yes	Yes	Self-service on ACORN
Yes	No	Yes	Self-service on ACORN
No	Yes	Yes	Submit fee deferral form
No	No	No	Not eligible for deferral

2.0 FEES AND FUNDING

The Institute's annual stipend is based on a student's year of study, their legal status, and whether they will receive a major annual award ($\geq$ \$10,000) or not.

2.1 Educational costs and funding

Students are responsible for paying all tuition and fees from the stipend and are subject to penalties due to late or overdue fees.

Tuition and Stipend	MASc		PhD	
	Domestic	International	Domestic	International
Tuition and Fees	\$8,054	\$30,120	\$8,810	\$8,579
Basic Funding	\$26,000	\$44,000	\$28,000	\$28,500
Award Funding	\$28,000	\$46,000	\$30,000	\$30,500

2.2 Guaranteed minimum stipend

Students in the MASc or Ph.D. program receive a guaranteed minimum funding for two or four years, respectively, if they remain in good academic standing. The stipend comprises two funding sources: 1) supervisors' research grants and/or industry funds and/or 2) the Institute of Biomedical Engineering. Funding from BME is reported on the student invoice as "U of T Fellowship – BME". The Institute regulates the minimum stipend, but the maximum amount is decided by the student's own supervisor(s). There are two stipend categories:

- Basic funding: The minimum funding support for students within the funded cohort.
- Award funding: The minimum funding support for student with major awards valued at/over ten thousand dollars (Canadian).

2.2.1 Funded cohort

The funded cohort is defined as the group of students that are receiving a guaranteed minimum stipend. Master's students are guaranteed funding from their supervisor(s) for two years, and doctoral students are guaranteed funding from their supervisor(s) for four years. Master's ($\$_{MAS}$) and doctoral ($\$_{DOC}$) level funding per year is tabled below.

Program	Year 1	Year 2	Year 3	Year 4	Year 5
MASc	$\$_{MAS}$	$\$_{MAS}$			
PhD (Transfer)	$\$_{DOC}$[2]	$\$_{DOC}$	$\$_{DOC}$	$\$_{DOC}$	
PhD (Direct entry)	$\$_{DOC}$	$\$_{DOC}$	$\$_{DOC}$	$\$_{DOC}$	
PhD	$\$_{DOC}$	$\$_{DOC}$	$\$_{DOC}$	$\$_{DOC}$	

Note 1: Stipend for the master's program after year two and for the doctoral program after year four is not guaranteed.

Note 2: The first year of doctoral-level basic funding is guaranteed only for students who successfully complete the program transfer process, which includes passing the MASc bypass exam, within the accepted time limit (i.e., transfer to PhD before the end of the fourteenth month of study at the latest). This change is not available to master's students categorized under award funding in their first year.

2.2.2 Departmental contribution
The departmental contribution is provided only to domestic students without a major award. Major award holders will have the departmental contribution replaced by award funds. Master's students will receive one year of funding from BME, and doctoral students will receive up to four years of funding from BME. After this period, supervisors are responsible for determining and providing the full stipend value.

International students who obtain permanent residency may be eligible for the departmental contribution after providing proof of legal status change to the School of Graduate Studies. Students in this category may receive the departmental contribution if they fall within eligible years (i.e., PhD students in year three or earlier).

2.2.3 Basic funding table
Students without major awards ($< \$10,000$)

Financial Support		MASc		PhD	
Year	Fund Source	Domestic	International	Domestic	International
1	Department	$8,000	$0	$10,000	$0
	Supervisor	$18,000	$44,000	$18,000	$28,500
	Total	**$26,000**	**$44,000**	**$28,000**	**$28,500**
2	Department	$0	$0	$10,000	$0
	Supervisor	$26,000	$44,000	$18,000	$28,500
	Total	**$26,000**	**$44,000**	**$28,000**	**$28,500**
3	Department			$10,000	$0
	Supervisor			$18,000	$28,500
	Total			**$28,000**	**$28,500**
4	Department			$10,000	$0
	Supervisor			$18,000	$28,500
	Total			**$28,000**	**$28,500**

5[1]	Department		$0[1]	$0
	Supervisor		$28,000	$28,500
	Total		**$28,000**	**$28,500**

2.2.4 Award funding table

Students holding major awards (≥ $10,000)

Financial Support		MASc		PhD	
Year	Fund Source	Domestic	International	Domestic	International
Any	Department	$0	$0	$0	$0
	Award[2]	$28,000	$46,000	$30,000	$30,500
	Total	**$28,000**	**$46,000**	**$30,000**	**$30,500**

Note 1: there may be departmental support for doctoral students in year five, but this funding is not guaranteed. Support will only be provided based on funding availability, which may vary from year to year.

Note 2: award funds may include a top-up from the supervisor. The availability and value of the top-up is decided by the supervisor.

Learn more online →

2.3 Fellowships and awards

Students should apply for all eligible 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), the Canadian Institutes of Health Research (CIHR), and 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. Some scholarships may be multi-year awards, in which case it is the student's responsibility to complete all necessary documentation to facilitate continuation of his/her award. Students are responsible for monitoring award application schedules. Information about student awards and scholarships is available online on the Institute's website.

Learn more online →

2.4 Teaching assistantships

BME students are not required to teach. However, several optional teaching assistant (TA) positions are available to students in research programs. Students seeking TA positions must first discuss this intent with their primary research supervisor before applying. This discussion ensures that the teaching opportunity aligns with supervisor's training objective for the students. Information about vacant TA positions becomes available on the BME website approximately one to two months prior to the beginning of each term. TAs are members of the Canadian Union of Public Employees (CUPE Local 3902) and must comply with all terms and conditions set within the collective agreement between the union and the University of Toronto's Governing Council.

2.5 Holding employment while studying

Research-stream students intending to work (or take an internship) while studying full time must negotiate terms and conditions with their primary research supervisor prior to seeking or holding employment in parallel with academic obligations. Registered students must meet program requirements and milestones, and make progress toward degree completion. Thus, supervisor approval for employment must be documented in writing, and a record of agreement should be readily available for verification by the Graduate Office, if/when it is requested.

2.6 Account setup

Students may receive stipend payments by cheque or through direct deposit to a Canadian bank account. The student is responsible for ensuring the mailing address and banking information are correct and up to date.

2.6.1 Direct deposit setup

Students are strongly encouraged to set up direct deposit to receive both departmental and supervisor funds. Set up direct deposit by following **both** instructions below.

(1) The student needs to set up direct deposit on ACORN to receive the **institute** funds. The instructions are on https://help.acorn.utoronto.ca/how-to/ under the "Finances" section.

(2) The student needs to set up direct deposit on HRIS (for supervisor contribution) by emailing the U of T Payroll Bank Authorization Form for Direct Deposit (https://bme.utoronto.ca/services/forms-and-resources/) to the BME HR Office at hr.bme@utoronto.ca to receive the **supervisor** funds. If the supervisor holds their research funds outside of BME (e.g., at an affiliated hospital), the student needs to make payment arrangements with their local/on-site HR department. Please consult your supervisor.

2.6.2 Activate Payment

At the beginning of every academic year (normally around late July/early August), students must complete and a BME Supervisor–Student Agreement Form and return it to the Graduate Office to activate stipend pay instalments.

3.0 RESEARCH PROGRAMS

3.1 Master of Applied Science (MASc)

The Biomedical Engineering Program leading to the Master of Applied Science degree provides an opportunity for students to pursue advanced research studies within the field of Biomedical Engineering. The master's program requires full-time study, with students committed to completing the degree requirements within 18–24 months of registration. The program of study normally consists of four half-credit courses (2.0 full course equivalents in total) relevant to the student's research project and a research thesis completed under the guidance of a supervisor. A half-credit course is defined as one semester long (approximately thirteen weeks). Courses should be chosen in consultation with the thesis supervisor. Completion of the MASc in Biomedical Engineering requires the submission of a thesis on an original body of work in the field of biomedical engineering and an oral defense of that research. It is highly recommended to have a supervisory committee meeting a few months before completing the thesis and before scheduling

the departmental defense. A departmental defense examination will not be scheduled if the student has never had a committee meeting during his or her program.

3.1.1 Requirements related to the research thesis
- Supervisory committee meetings (at least once per year or more frequent)
- Completion of a research thesis
- Departmental defense

3.1.2 Required courses

Category	Code	FCE/CR	Frequency	Notes
Health & Safety	Various	CR	Various	See 4.1 Health and safety training
Compulsory	RST9999	CR	Every session	Automatic enrollment
	JDE1000	CR	Once	Available in Fall or Winter
	BME1010	1.0 FCE	Every Fall and Winter	Enroll until program completion
Foundation	BME1477	1.0 FCE	Student selects at least 2 of 3	Courses build a foundation for research; these courses are non-specific to a specialty area.
	BME1478			
	BME1479			
Technical Electives	Student selection	1.0 FCE	Take a minimum of 1.0 FCE in electives	Choose courses that fit your research interest and specialty.

3.1.3 Permission to write and defend
See 4.8 Permission to write and defend

3.1.4 Departmental defense
See 4.9 Departmental defense

3.2 Doctor of Philosophy (PhD)
The Doctor of Philosophy (PhD) degree is intended for students performing research at the most advanced level. Doctoral program candidates usually hold a thesis-based master's degree. A program of study for students admitted into the PhD program normally consists of two half-credit courses, a PhD qualifying examination, and the successful completion and defense of an extensive research thesis on an original body of work in the field of biomedical engineering. All required courses should be completed within the first two years, and no more than four years should be needed to complete all degree requirements.

3.2.1 Requirements related to the PhD research thesis
- Supervisory committee meetings (at least once per year or more frequent)
- PhD qualifying exam/MASc bypass exam
- PhD candidacy
- Completion of a research thesis
- Departmental defense
- PhD final oral examination

3.2.2 Course requirements

Category	Code	FCE/CR	Frequency	Notes
Health & Safety	Various	CR	Various	See 4.1 Health and safety training
Compulsory	RST9999	CR	Every session	Automatic enrollment
	JDE1000	CR	Once	Available in Fall or Winter
	BME1011	1.0 FCE	Every Fall and Winter	Enroll until program completion
Foundation	BME1477	1.0 FCE	Student selects at least 2 of 3	Courses build a foundation for research; these courses are non-specific to a specialty area.
	BME1478			
	BME1479			

3.2.3 PhD qualifying examination

Doctoral students are required to conduct a qualifying exam to ensure that they possess the knowledge, skills, and abilities required to complete the PhD program. The PhD qualifying exam may also serve as the bypass exam for students from the MASc program who wish to transfer to the PhD program. The PhD qualifying exam should be held by the twelfth month of study, but it must be completed by the fourteenth month of study at the latest. Successful completion of the qualifying exam is a condition of continued program registration. Thus, it is recommended (albeit optional) that students hold a supervisory committee meeting three months before the exam date to receive guidance on preparation, procedures, and expected outcomes of the qualifying exam.

3.2.4 Candidacy

Doctoral students should complete the coursework component of their program within the first two years of study. However, by the end of the third year, doctoral students must (a) have an approved thesis topic, supervisor, and supervisory committee, (b) complete all coursework, and (c) pass the PhD qualifying exam to achieve candidacy. A doctoral student will be denied further program registration and will have their registration eligibility terminated if the student has not completed these requirements by end of 3 years in the program.

The notation *Candidacy Achieved* will appear on the transcript of a student who has completed all requirements for the degree exclusive of the thesis. This notation is also visible in the student academic history (unofficial transcript) on ACORN. In exceptional circumstances, a student who has failed to achieve candidacy (complete all the requirements for the doctoral degree exclusive of the thesis) before the end of the third year may be considered for an extension for a maximum period of 12 months, if the student provides the following documents to the Graduate Office:

1. a request for extension to achieve candidacy form; and
2. a substantive written rationale to explain the causes for the delay and to reaffirm their commitment to completing candidacy requirements within the extension deadline.

These documents will be considered by the Associate Director, Graduate Programs, for extension approval. If the request is denied, the student may be asked to withdraw from the doctoral program.

3.2.5 Permission to write and defend
See 4.8 Permission to write and defend

3.2.6 Departmental defense (optional for PhD)
See 4.9 Departmental defense – Doctoral candidates may undertake up to two examinations to complete the thesis requirement for the BME program – a departmental defense and the PhD final oral exam. In both cases, the candidate will be examined on an oral presentation and the written thesis. The departmental defense for doctoral students is optional but highly recommended. Permission to omit the departmental defense may be granted by the primary research supervisor. This permission must be provided in writing to the BME Graduate Office. A brief statement from the supervisor's institutional email is sufficient.

3.2.7 PhD final oral examination (FOE)
All PhD students must defend their thesis at a PhD final oral exam, which is organized by BME and SGS, collaboratively. In compliance with SGS regulations, each graduate unit sets their own timeline requirements. BME requires **at least 3 months of advance notice** to prepare for the PhD final oral exam. This timeline starts with submission of the PhD External Appraiser Approval Request Form. The reason for this timeline requirement is to account for communication delays, national and international holidays, travel arrangements, and the coordination of multiple exams in parallel at the institute.

3.3 Doctor of Philosophy (direct entry)
In the direct entry program, students enter doctoral studies after completion of their undergraduate program.

3.3.1 Requirements related to the PhD research thesis
See 3.2.1 Requirements related to the PhD research thesis

3.3.2 Course requirements

Category	Code	FCE/CR	Frequency	Notes
Health & Safety	Various	CR	Various	See 4.1 Health and safety training
Compulsory	RST9999	CR	Every session	Automatic enrollment
	JDE1000	CR	Once	Available in Fall or Winter
	BME1011	1.0 FCE	Every Fall and Winter	Enroll until program completion
Foundation	BME1477	1.0 FCE		

	BME1478 BME1479		Student selects at least 2 of 3	Choose research skills that complement your existing talents
Technical Electives	Student selection	2.0 FCE	Take a minimum of 2.0 FCE in electives	Choose courses that fit your research interest and specialty.

3.3.3 PhD qualifying examination
See 3.2.3 PhD qualifying examination

3.3.4 Candidacy
See 3.2.4 Candidacy

3.3.5 Permission to write and defend
See 3.2.5 Permission to write and defend

3.3.6 Departmental defense (optional for PhD)
See 3.2.6 Departmental defense (optional for PhD)

3.3.7 PhD final oral examination (FOE)
See 3.2.7 PhD final oral examination (FOE)

3.4 Doctor of Philosophy (transfer)
Master's students who have not completed more than fourteen months of the master's program and have demonstrated excellent academic performance (i.e., maintained at least an A- grade point average) may be permitted to bypass the master's program and fast-track into the PhD program under the same research supervisor. Said students must conduct the MASc bypass exam, which is logistically identical to the PhD qualifying exam. Permission for master's students to conduct the bypass exam is granted by the student's supervisory committee. Due to program timeline constraints, master's students may have one attempt to pass the bypass exam. After a successful exam outcome, the master's student may transfer into the PhD program by returning a completed program transfer form to the Graduate Office.

As master's students who fast-tracked into the PhD program have not completed their master's program, they are effectively in the same category of students who entered the PhD program directly (i.e., direct entry) after completion of undergraduate studies. After completion of the transfer process, students will be registered in year two of their PhD program and will follow the same timeline and academic requirements of the PhD (direct entry) program thereafter. For instance, these students must now complete six half-courses instead of four.

3.4.1 Requirements related to the PhD research thesis
See 3.2.1 Requirements related to the PhD research thesis

3.4.2 Course requirements
See 3.3.2 Course requirements

3.4.3 MASc bypass examination
See 3.2.3 PhD qualifying examination

3.4.4 Candidacy
See 3.2.4 Candidacy

3.4.5 Permission to write and defend
See 3.2.5 Permission to write and defend

3.4.6 Departmental defense (optional for PhD)
See 3.2.6 Departmental defense (optional for PhD)

3.4.7 PhD final oral examination (FOE)
See 3.2.7 PhD final oral examination (FOE)

4.0 GRADUATE PROGRAM REQUIREMENTS

4.1 Health and safety training
MASc and Ph.D. students must take the Environmental Health & Safety (EHS) Training and the BME Health and Safety Orientation at the beginning of the program. Afterward, students must take the Workplace Hazardous Materials Information System (WHMIS) refresher course annually. **Students are prohibited from starting laboratory work until all Health and Safety Training requirements are completed**. Additionally, students are required to attend mandatory specialized safety courses (e.g., laser safety, radiation safety, etc.) specific to their research and training environment. Consult your supervisor on your specific training requirements.

Learn more online →

4.2 Graduate student seminars
The BME graduate student seminar series aims to provide practical experience in giving seminars to an educated audience. This seminar enables communication with other students and members of the Institute. Organizing and giving seminars are essential skills for professional life. The emphasis is different from a group meeting or conference-style talk, which is usually delivered to a specialist audience. Practicing speaking to a general audience will help with job talks or teaching situations. The seminars also provide the community with knowledge of the various interdisciplinary research activities undertaken by trainees at the institute.

The seminars consist of two 25-minute presentations given by graduate students at the Institute. Seminars take place every Wednesday, Thursday, and Friday for students in the Clinical, Molecular, and Cell & Tissue Engineering streams, respectively. Invited Speaker Seminars take place on the first Tuesday of every month.

All research-stream students are required to attend a **minimum of six graduate student seminars per semester** and **four invited seminar series talks per year** to fulfill BME 1010/1011Y requirements. An interactive audience is essential – do not hesitate to ask questions. Participation is a core requirement of the BME graduate program.

4.3 Supervisory committee meetings

All graduate students registered at the institute must have at least **one committee meeting within the first year of registration**. Subsequently, students must schedule a meeting with the supervisory committee at least once every year (or more frequently if necessary) to discuss their progress. The annual committee meeting is required for every year until program completion. Of note, BME internal (i.e., departmental) awards will require students to fulfill the annual committee requirement prior to applying to be competitive.

SGS General Regulations 7.5.2 Supervision and Satisfactory Progress:

- A student who fails to constitute a supervisory committee by the required time (within twelve months of registration) may lose good academic standing.
- A student is expected to meet with this committee at least once a year, and more often if the committee requires.
- A student who, through their 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.

A missed meeting is a failed meeting (i.e., unsatisfactory) on the student's record for the relevant academic year. A satisfactory performance rating by the committee is a requirement for continued enrollment and funding in the graduate program. The meeting report, which is an account of the committee meeting and its deliberations, form part of the student's official record.

The supervisory committee must consist of at least three faculty members at the University of Toronto with current/active membership in the School of Graduate Studies. The committee must include the primary research supervisor (and co-supervisor if applicable) and two additional members of the graduate faculty. Conversely, the supervisory committee should not exceed four members because large committees can become problematic for meeting and examination scheduling.

The student is required to submit their research progress report to the members of the committee a minimum of two weeks before the meeting. The initial progress report should include background information regarding previous research carried out in the field, current progress on the student's research project, any results achieved, and future work plans. Charts and figures should be included in the report. For subsequent committee meetings, the student will need to ensure that their progress report addresses the concerns raised by the committee during the previous meeting(s).

Remote committee meetings

Depending on social distancing rules and guidelines, students may not be able to have their committee meetings in person during the academic year. Students may use online tools (e.g., Microsoft Teams, Zoom, etc.) for virtual meetings, defenses, group work, etc.

4.4 Curriculum plan

The institute provides a general framework for fundamental skill development through course requirements. However, the supervisor and supervisory committee guide the specifics of a student's academic training. BME recommends that students consult their supervisor(s) to design a specific coursework plan that would cover the knowledge and skills necessary to undertake their research project. It may also benefit students to seek input from peers who have taken a given course to understand the expected course workload and educational outcomes.

ACORN

Students should use ACORN to self-enroll in courses. For help using ACORN, see https://help.acorn.utoronto.ca/how-to/ for more information.

4.5 Course requirements

In addition to compulsory courses (e.g., RST9999) and the Graduate Student Seminars (i.e., BME1010 or BME1011), the following table summarizes the minimum course requirements, weighted as full course equivalents (FCE), that students are required to take to fulfill the coursework requirement of their respective program.

Course Requirements	MASc	PhD	PhD (Direct entry & Transfer)
Foundation courses (take at least 2 of 3)	1.0 FCE	1.0 FCE	1.0 FCE
Additional technical electives	1.0 FCE	None	2.0 FCE
Total FCE	*2.0 FCE*	*1.0 FCE*	*3.0 FCE*

Foundation courses help students with their training. Foundation courses are not specific to a discipline but can be applied across different research subjects. The three courses are BME1477, 1478, and 1479. Students are required to take at least two out of three of these courses.

4.6 Subject specializations

Students can use the following tables of recommended electives as a guide for creating a specialized learning plan to bolster knowledge and gain expertise on topics of interest. However, note that the specialization course listings are not comprehensive. If a student finds a course from another Engineering department that is a better fit for their training, the student should discuss this course with their research supervisor and/or supervisory committee. The curriculum should be custom-tailored to the student's training and interests. Elective recommendations may change from time to time depending on instructor availability. The following is a list of subject specialization topics:

- Molecular Engineering
- Imaging
- Nanoengineering
- Regenerative Medicine

- Microengineering
- Neural Engineering
- Rehabilitation Engineering
- General Biomedical Engineering (for students without an engineering background)

Molecular Engineering: Introduction to concepts and research developments in building devices and systems using molecules. In addition to the two required courses, the student is encouraged to take four of the six specialty courses.

Required courses – Select at least 2	Recommended courses – Select up to 4
BME1477	BME1459
BME1478	JCB1349
BME1479	JMB1050
	CHE1125
	CHM1104
	BME1453
	APS course (any)

Imaging: Introduction to concepts and research developments in molecular, cell, and tissue imaging as well as the use of imaging for disease diagnosis. In addition to the two required courses, the student is encouraged to take four of the six specialty courses.

Required courses – Select at least 2	Recommended courses – Select up to 4
BME 1477	BME1459
BME1478	BME1460
BME1479	BME1462
	BME1466
	ECE1475
	JEB1433
	BME1453
	One APS-coded course (any)

Nanoengineering: Introduction to concepts and research developments in the areas of nanotechnology and the building of systems and devices at the nanoscale. In addition to the two required courses, the student is encouraged to take four of the six specialty courses.

Required courses – Select at least 2	Recommended courses – Select up to 4
BME 1477	CHE1333
BME1478	MBP1410
BME1479	PCL1004
	JPB1022
	MIE1359

	BME1453
	One APS-coded course (any)

Regenerative Medicine: Introduction to concepts and research developments in the cell and tissue engineering and regenerative medicine. In addition to the two required courses, the student is encouraged to take four of the six specialty courses.

Required courses – Select at least 2	Recommended courses – Select up to 4
BME1477	BME1454
BME1478	MIE1359
BME1479	DEN1081
	JPB1022
	JTC1331
	LMP1103
	CHE1334
	One APS-coded course (any)

Microengineering: Introduction to concepts and research developments using microfabrication systems to build devices and systems for analysis, diagnostics, and implantation. In addition to the two required courses, the student is encouraged to take four of the six specialty courses.

Required courses – Select at least 2	Recommended courses – Select up to 4
BME 1477	BME1560
BME1478	MIE1359
BME1479	BME1462
	BME1460
	One APS-coded course (any)

Neural Engineering: Introduction to concepts and research developments in engineering devices and systems for interfacing with and manipulation of the brain. In addition to the two required courses, the student is encouraged to take four of the six specialty courses.

Required courses – Select at least 2	Recommended courses – Select up to 4
BME 1477	BME1472
BME1478	BME1802
BME1479	BME1500
	JEB1444
	BME1473
	JPB1071
	BME1580
	One APS-coded course (any)

Rehabilitation Engineering: Introduction to concepts and research developments in rehabilitation technologies for patients. In addition to the two required courses, the student is encouraged to take four of the six specialty courses.

Required courses – Select at least 2	Recommended courses – Select up to 4
BME 1477	BME1473
BME1478	BME1471
BME1479	REH1510
	REH5100
	BME1466
	BME1580
	One APS-coded course (any)

General BME: This set of classes introduces the broad field of biomedical engineering to students who may have trained in a non-engineering field. In addition to the two required courses, the student is encouraged to take four of the eight specialty courses.

Required courses – Select at least 2	Recommended courses – Select up to 4
BME 1477	BME1454
BME1478	BME1462
BME1479	BME1560
	BME1580
	BME1478
	IMM1431
	One APS-coded course (any)

Mix and Match: Beyond course recommendations, students may also tailor their own curriculum plan. Students can mix and match classes to fit the needs of their research project. Students should consult their supervisor(s) to learn more about course selection. In addition to the two required courses, the student is encouraged to take four courses offered by institute.

Required courses – Select at least 2	Technical electives – Select up to 4
BME 1477	One APS-coded course (any)
BME1478	
BME1479	

NOTES

APS Courses: For a list of APS courses and descriptions, please go to
https://gradstudies.engineering.utoronto.ca/professional-degrees/elite-emphasis/

BME Courses: For a list of BME courses and descriptions, please go to
https://bme.utoronto.ca/current-students/course-calendar/

4.7 Thesis requirements
BME recommends following SGS guidelines on the style and formatting of the research thesis, but the research supervisor(s) and committee ultimately decide on the acceptance criteria of the student's thesis. Students are encouraged to review thesis copies from alumni in the relevant field (e.g., previous students from the same lab) to gauge thesis expectations. The U of T Libraries have established a free and secure research thesis repository (https://tspace.library.utoronto.ca) for access to previous theses.

Learn more online →

4.8 Permission to write and defend

The thesis writing process formally commences with permission granted by the supervisory committee (marked on the committee meeting form), and the thesis itself could take several months to draft. Once a draft of the thesis is completed to the satisfaction of the primary supervisor (and co-supervisor if applicable), the student should submit the thesis to the defense committee (i.e., supervisory committee members and the internal-external examiner).

Learn more online →

4.9 Departmental defense
(*) The departmental defense is required for master's students and optional for PhD students. Permission to proceed directly to the PhD final oral exam, and omit the department defense, is granted by the primary research supervisor. This permission must be provided in writing to the Graduate Office.

Examination of the candidate will be based on both the oral presentation and the written thesis. The student is responsible for coordinating the departmental defense with guidance from the primary supervisor. For the thesis to be properly appraised, students must submit the thesis to the examination committee three weeks before the exam. Failure to do so may result in cancellation of the examination. Students are responsible for examination meeting arrangements, including coordinating the meeting time and location with the defense committee. The candidate must also put together all the required documents and forms for the defense and make these available during the examination.

4.9.1 Bring the following documents to your examination
1. A copy of the previous committee meeting form – Required
2. A copy of the student's most recent academic transcript (unofficial) – Required
3. The departmental defense form – Required
4. Physical print copies of the student's thesis for all members – Optional

4.9.2 Examination committee composition
The examination committee comprises the supervisory committee plus one independent examiner. All voting committee members must hold a SGS appointment. The independent (also known as the "internal-external") examiner must be at arm's length from the candidate. The internal-external

examiner may be a faculty member of the candidate's graduate unit and/or a faculty member of other departments, centres, or institutes of the University of Toronto. The internal-external member must have graduate faculty membership and expertise relevant to the student's research topic but must not be a collaborator or committee member.

The exam committee must have:
1) a supervisor and co-supervisor if applicable; and
2) two regular supervisory committee members who hold SGS appointments; and
3) an internal-external examiner (with an SGS appointment) not associated with supervision of the project but knowledgeable in the field.

The chairperson of the defense may be any member of the supervisory committee. The chairperson should ensure: (1) all members adhere to the agenda and maintain order, (2) the defense is conducted fairly, (3) all members are given an appropriate amount of time to question the candidate, and (4) the defense is adjourned in a timely manner.

4.9.3 MASc departmental defense outcomes
Based on the written thesis and the oral defense, the committee may recommend that:
- The thesis be accepted as is and the candidate be awarded the master's degree; or
- The candidate be awarded the degree subject to minor corrections of the thesis; or
- The candidate be awarded the degree subject to minor modifications of the thesis; or
- 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 later; or
- The candidate withdraw from the program.

4.9.4 PhD departmental defense outcomes
Based on the written thesis and the oral defense, the committee may recommend that:
- The candidate be granted permission to proceed with the PhD final oral exam; or
- 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 later; or
- The candidate withdraw from the program.

4.10 Thesis corrections
Those committee members who find the thesis acceptable must also indicate whether the thesis is acceptable as is or whether it 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.

Program completion is achieved by submission of the final corrected thesis to the U of T thesis repository. Students must follow SGS guidelines for electronic thesis submission.

5.0 ACADEMIC POLICIES

5.1 Adding or dropping courses

Students may take graduate courses offered at any of the three campuses (St. George, Scarborough, and/or Mississauga). Students may self-enroll into courses using ACORN during the course enrollment period. Normally, course enrollment intake begins in early August and ends in mid-September. However, student will not be able to add or drop courses after the prescribed SGS deadlines. Pay attention to SGS sessional dates to monitor program deadlines.

5.1.1 BME courses

- During the course enrollment period, students may self-enroll into the desired course through ACORN.
- After the course enrollment period, students who wish to add or drop BME courses must complete the SGS Add/Drop Courses form. Students can find this form on the SGS website.

5.1.2 Non-BME courses (i.e., courses in other departments)

Some courses will require instructor approval, but the student still makes the request on ACORN. Once the course instructor(s) approve the list, the student's status will change from 'INT' to 'APP'. Courses in other departments can be taken with approval from the student's primary supervisor. However, BME does not have control over other departments' courses, so the student will have to find out how to enroll.

Learn more online →

5.2 Grading and evaluation

Students can view and print their complete academic history by visiting the Academic History page on ACORN. Students are encouraged to monitor their grades (at least once per session) to keep track of their academic progress. The academic report from ACORN is not an official transcript. Students who would like to acquire an official transcript must purchase them from the University of Toronto Transcript Centre. Moreover, official University of Toronto grade scales are available in the Transcript Guide.

Learn more online →

5.3 Academic misconduct

Students in graduate studies are expected to commit to the highest standards of integrity. It is the student's responsibility to be aware of academic misconduct policies and what constitutes plagiarism.

Learn more online →

5.4 Good academic standing and satisfactory progress

All research-stream graduate programs include coursework and other academic activities, such as student seminars, annual committee meetings, and thesis projects. Students should maintain a minimum grade performance of A- in all graduate courses for scholarship eligibility. The passing mark is B-, and any grade below this benchmark constitutes a failure (i.e., FZ).

Additionally, students must maintain satisfactory progress in their research to remain in "good academic standing". Good standing means that a candidate has no past or current sanctions on their university record and is not subject to any current disciplinary investigations (relating to either their academic performance or conduct) which may bring the program into disrepute.

Key metrics for satisfactory program progress:
- Performance in courses (the passing mark is B- in all courses, i.e., 70% and most graduate scholarships require a minimum GPA of A- for eligibility)
- Supervisory committee meetings (yearly or more frequently)
- Satisfactory progress in research, which is determined by the supervisory committee

Unsatisfactory performance in courses:
Failing courses can have severe consequences. BME may recommend to SGS the termination of the registration of students who at any time accumulate two failing grades (i.e., FZ).

Unsatisfactory progress in research:
Students whose research work is unsatisfactory in the opinion of their supervisory committee or who have not met the annual supervisory committee meeting requirement (e.g., missed two consecutive meetings) may face termination of program registration. The supervisory committee has full authority to recommend the termination of a student's degree program due to inadequate research progress.

5.5 Ethics

5.5.1 Ethical conduct in research
Graduate students should be familiar with and follow the policy on ethical conduct in research.

5.5.2 Ethics: research involving human subjects
All graduate student and faculty research involving human subjects must be reviewed and approved by relevant institutional Research Ethics Board (REB) before work can begin. The student is responsible for learning the relevant policies and completing the relevant ethics tutorials.

Learn more online →

5.6 Intellectual property
Intellectual property (IP) is the product of intellectual or creative activity that can be protected under the law (to some extent). There are various forms of legal protection. Copyright is likely to be to most relevant to research students. The University's Copyright Policy governs the rights in IP created by members of the University community. This policy is administered by the Office of the Vice-President, Research. Students should learn the impact of these policies on their research.

5.7 Supervision
SGS provides guidelines on the responsibilities of the student, supervisor, and supervisory committee.

5.8 Policy on extension and late withdrawal requests for graduate courses

If an extension is needed in a graduate course, the student should send a request for an extension to the instructor within two business days after the deadline for completing that component of the course. The request must be supported by medical documentation (see http://www.illnessverification.utoronto.ca) if the reason 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 must be sent to the BME Graduate Office using the form on the website: https://www.sgs.utoronto.ca/current-students/student-forms-letter-requests/

We strongly recommend that students request an extension instead of a late withdrawal from a course whenever applicable. A request for a late withdrawal from a course should be sent to the BME Graduate Office during the session in which the course is offered. Such requests are approved only under exceptional circumstances such as a serious illness or bereavement. These requests must be supported by appropriate documentation (e.g., http://www.illnessverification.utoronto.ca). The BME Graduate Office is unlikely to approve a request for a late withdrawal after the final course marks have been communicated to the students.

Requests for extensions or late withdrawals may be granted or denied by the BME Graduate Office. In the case of an extension, if the course is not completed by the deadline, then the report of incomplete (INC) is permanently recorded in the student's transcript.

5.9 Academic appeals
Graduate students may appeal substantive or procedural academic matters, including grades, evaluation of comprehensive examinations, and other program requirements; decisions about the student's continuation in any program; or concerning any other decision with respect to the application of academic regulations and requirements to a student.

6.0 PROGRAM LEAVES, TRANSFERS, AND WITHDRAWALS

6.1 Leave of absence (LOA)

Graduate students may apply for a one session (i.e., a semester) to three sessions leave during their program of study due to:

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

Applying for a LOA

Students will need to provide the BME Graduate Office with a) written proof that their supervisor supports their leave of absence (e.g., through an email exchange), b) a filled out a Leave of Absence Form (available on SGS's Student Forms & Letter Requests page) returned to the BME Graduate Office via email. The request will be reviewed by the Associate Director, Graduate Programs (i.e., Graduate Coordinator), and if approved, sent to the School of Graduate Studies for final approval. Once a decision has been made, the Graduate Office will inform the student of the outcome of their request.

Note: It is expected that leaves coincide with sessional start and end dates (see the SGS sessional dates for the start and end dates). In exceptional circumstances, students may request special arrangements by submitting a LOA form along with a separate document with a rationale for the nonstandard start and/or end date.

What to expect while on leave

SGS General Regulation 6.1.15 Leave Policy

- Once on leave, students will neither 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. Students on an approved leave of absence may opt in to pay compulsory non-academic incidental fees and receive continued access to campus services offered by Student Life (Academic Success Centre, Career Centre, Centre for International Experience, Centre for Community Partnerships, Health and Wellness, etc.), Hart House, and the Faculty of Kinesiology & Physical Education during a leave of absence.
- Students on leave for parental or health reasons who wish to consult with their supervisor or other faculty are advised to make special arrangements through their graduate unit.

In addition, the student's academic timeline and student funding will be paused for this period.

Return to study before reaching the end of an approved leave period

If you would like to return to your studies before your LOA ends, you will need to inform the BME Graduate Office through email. To discuss how this will affect your academic timeline, please consult the Gradate Office.

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Learn more online →

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6.2 Guidelines on personal time off

Graduate students can take up to 15 business days per academic year in personal time off, in addition to statutory holidays and days designated as University closures or holidays. This time off is not mandatory.

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6.3 Program transfer

6.2.1 Transfer from PhD to MASc

A PhD student may choose to transfer to the MASc program for several reasons, such as the program no longer being compatible with their career goals. Students transferring from the PhD program to the MASc program must complete all MASc degree requirements (see MASc degree and course requirements section) to be awarded the master's degree. The option of transferring from the PhD to MASc program is available to students who have:

- not completed an MASc in Biomedical Engineering at the University of Toronto; and
- are in *Good Standing* in their PhD program.

To start the transfer process, the student will need to submit a program transfer form along with a rationale to Graduate Office. They must copy their supervisor, who will need to indicate their approval. The student's rationale and program transfer form will be reviewed by the Associate Director, Graduate Programs. If this request is approved, the transfer form will be sent to SGS for final approval.

Important notes
- Students who transfer from the PhD to the master's program will not be permitted to transfer subsequently to the PhD program within the same graduate unit unless approved by the SGS Admissions and Programs Committee.
- PhD candidates who have twice failed their PhD Qualifying Exam will not be considered for a transfer to the MASc program as they are no longer in good standing.
- International PhD students who transfer to and complete the MASc program may be required to pay a balance of degree fee. The balance of degree fee is the minimum degree fee minus program fees already paid by the student. The balance of degree fee is assessed by SGS just prior to graduation. The payment due date for the balance of degree fee is three months from the student's convocation. If the fee is unpaid, students are charged a monthly service fee of 1.5% compounded (19.56% per annum).

6.2.2 Transfer to another department at U of T

If a graduate student decides they would like to transfer to a different department, they will need to get permission to transfer from their current supervisor and both Graduate Coordinators from their current department and their prospective new home department. This can be done by sending the Graduate Office a completed Program Transfer form (signed by the new department's Graduate Coordinator) and a written rationale for the transfer. The student should provide the Graduate Office with proof that their current supervisor, new supervisor, and new department are aware and approve the transfer. This can be done by copying the abovementioned parties on the email submission of the Program Transfer form to the Graduate office. The Graduate Office will have the BME Graduate Coordinator review the Program Transfer form. If the Graduate Coordinator approves this transfer request, the form will be sent to SGS for final approval.

6.2.3 Transfer to another primary supervisor

To meet the requirements of the BME research program, all graduate students must have a supervisor. Students are accepted into the research program at the Institute to undergo intensive academic training under the guidance and sponsorship of a research supervisor (and co-supervisor, if applicable). Although every effort is made, during recruitment, to ensure matching interests between the student and the supervisor under whom the student is originally admitted, individual goals and competencies may change during training such that the student may benefit from collaboration with a different supervisor. In such exceptional circumstances, a student may wish to change his/her primary supervisor.

Whereas academic change can play an important role in enhancing the educational experience, proper implementation of the change process is needed to mitigate potential barriers and/or disruption to the student's program and create opportunities for student success. The change of supervisor process is collaborative and provides for proper disclosure and cooperation between the student, the original (i.e., current) supervisor(s), and subsequently the new supervisor, and serves to establish a new supervisory relationship for the student to ensure academic continuity.

At a high level, the student is solely responsible for securing a new research supervisor in this process. In other words, the Graduate Office cannot match the student with a new supervisor. Instead, the Graduate Office works with the student, the original supervisor, and the new supervisor to provide all parties with process instructions, clarify documentation requirements, outline expectations, and answer process-related questions to officiate the transition. The student transfer to a new supervisor is completed by the joint signing of a new supervisor-student agreement, wherein funding obligations to the student are also transferred to the new supervisor. After completion of the change process, the original supervisor is relieved of his/her responsibilities to the student, and the student is expected to continue studying under the direction of the new supervisor with no change to their program timeline.

Normally, the Graduate Office will give the student a defined, but limited, period to identify a new supervisor (who may be from within or outside of BME). 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.

If the student unilaterally decides to stop working with his/her current supervisor and a new supervisor cannot be identified by the process deadline prescribed by the Associate Director, the Graduate Office may recommend that the student consider withdrawing from the BME program.

6.4 Program withdrawal or termination of registration

The Graduate Office may request to SGS the termination of the registration of a student who has failed two or more graduate courses or who has failed two attempts at their PhD Qualifying Examination or has shown a lack of research progress in two subsequent committee meetings. Normally, the Graduate Office will give the student the chance to voluntarily withdraw from the program within a defined period before the request for termination is formalized with SGS (a termination status can have profound consequences as it is permanently recorded on student transcripts).

7.0 GENERAL POLICIES

7.1 Change of address

Students are responsible for updating any address and/or telephone changes via ACORN. In addition, students should inform the Graduate Office and the Administrative Office in writing to make the necessary changes in the BME payroll system.

7.2 Office space and keys

Office and desk space are usually assigned to students upon registration. Enquiries related to a) office space allocation or b) keys for offices or laboratories should be emailed to the BME Operations Assistant (i.e., Judy Gilligan).

7.3 Mailboxes

There is one mailbox located in Room MB319 for any personal mail that may arrive for students.

7.4 Purchases

Students making purchases should consult with their supervisors to ensure that proper approvals are granted prior to purchasing.

7.5 Photocopy

Photocopying machines are in the BME Graduate Student Office (room RS422). Students using a photocopying machine must enter login identification assigned by the Operations Assistant.