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Welcome to Materials Science and Engineering!

The Graduate Student Handbook outlines the policies and procedure followed by the Department of Materials Science and Engineering. All students are advised to familiarize themselves with the regulations in the School of Graduate Studies Calendar (2019-20), available online: https://academiccalendars.romcmaster.ca/index.php?catoid=38

If you have any questions or concerns please do not hesitate to contact your Graduate Administrative Assistant (Grad Admin) in the Materials Science and Engineering main office, JHE-357.

CONTACTS

DEPARTMENT LEADERSHIP
Chair
Dr. Hatem Zurob | Extension 23515 | zurobh@mcmaster.ca

Associate Chair – Graduate
Dr. Joey Kish | Extension 21492 | kishjr@mcmaster.ca

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Research Technician
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MCMASTER ENGINEERING GRADUATE SOCIETY (EGS)
Student Department Reps
Farheen Ahmed (MASc candidate) | JHE-348 | ahmedff2@mcmaster.ca
Elliot Asare (MASc candidate) | JHE-A203C | asaree@mcmaster.ca

Disclaimer
In the event of a discrepancy between the information provided in this handbook and the School of Graduate Studies Calendar, the latter prevails.
GENERAL INFORMATION

Arrival

Upon your arrival, please come to the Materials Science and Engineering administrative office, located in John Hodgins Building (JHE) 357. Bring a copy of your offer letter and all official documents as indicated in your offer letter to clear your conditions.

☐ Official Transcripts
☐ Official Translations In English (if required)
☐ Confirmation of Degree completion (if not indicated on your transcript)
☐ Visa Students ONLY – bring a copy of your Study Permit. We will keep a copy on file.

Condition Clearing

Conditions must be cleared by the date indicated on your offer letter. This will not restrict your current enrollment. Mosaic will list your conditions and will be updated as they are cleared by the School of Graduate Studies. Failure to clear the conditions will result in your offer being rescinded.

Welcome Package

Every new graduate student will receive a welcome package which will include important paperwork that must be completed and submitted to the Graduate Administrative Assistant. To prevent delays in pay, please complete the following forms as soon as possible:

- Direct Deposit Forms (Mosaic and paper copy)
- Tax Forms – SIN required
- Employee Information form

Desk Assignments and Grad Office Policy

Desks are assigned to all full time, in-time students. While we do our best to provide overtime students a desk, this is not always possible and we may ask you to vacate or relocate.

Graduate offices are also shared offices. We try to keep similar research/supervisor groups together. At times discussions can be louder than anticipated. Please be mindful of others working nearby, and if possible take lengthy and group conversations outside. The “orange room” (JHE 352), the “green room” (JHE 247) and the Engineering Graduate Lounge (JHE 328) are options for meeting spaces and are available on a walk-in basis or can be booked in advance. Contact the department admin staff to book a room.

Each grad office is equipped with a microwave and fridge for short term small snacks and beverage storage. Meal preparation should be done at home. Alternatively, the Engineering Graduate Lounge (JHE 328) has a microwave, fridge and sink for use as well. Small snacks and cutlery may be left in the office if concealed in an air-tight plastic container. Dispose of food wrappers/scrap frequently in the bins in the hallway. If food issues, pests, rodents or other problems related to food become a concern, food and drinks privileges may be revoked. Food or drinks are not permitted in labs.

The custodial staff regularly washes the floors and empties the trash containers. Large items for disposal that do not fit in the containers should be clearly marked for disposal. The custodians do not clean desks or equipment of any kind.

**Graduate students are responsible for the general tidiness of their office, appliances, and their personal areas.**

Scent-Awareness

Persons entering our facilities should be encouraged to use scent-free products. Wherever practical, in our workplace, scent-free products should be used. The purchase and use of "unscented" products should be preferred over scented substitutes. Please minimize the use of, and exposure to, scented products in your office and when visiting JHE 357. Scented products more commonly used include the following:
• Personal hygiene products (e.g., shampoo, conditioner, hairsprays, deodorants, colognes, after-shaves, fragrances, perfumes, lotions, soaps, cosmetics and creams);
• Industrial and household chemicals and cleaners;
• Air fresheners (e.g., deodorizers, potpourri, oils and candles); and
• Various household products.


Keys
A number of keys are commonly used by graduate students. When you meet with your supervisor, you will find out what keys are required. Once the card access key form has been completed and signed by appropriate supervisor and administrative staff, take the form to the HUB (JHE-216a). There is a $20 key deposit required for each key and you will need to show your student ID. The deposit will be refunded when the key is returned when you graduate. Do not lend your keys, or allow anyone else into your office after hours. This is for safety and security reasons. Outside building keys are not permitted.

Graduate Mailboxes
Physical mailboxes are located in JHE-355. Mail is filed under the first letter of your last name. It is your responsibility to check your mailbox frequently. The correct address for your personal mailbox is:

Name, Graduate Student
Materials Science and Engineering (JHE-357)
McMaster University
1280 Main Street West
Hamilton, ON L8S 4L7

Outgoing mail can be left in the outgoing mail tray in the Department office (JHE-357).

FED EX
Students can FedEx research related items. Please complete the FedEx form found on the Resource page of the MSE website and bring it to JHE 357. You will be required to obtain an account number from your supervisor.
https://www.eng.mcmaster.ca/materials/resources#graduate-students

Photocopying and Paper
The photocopier is located in JHE-355. If photocopying or scanning is required for your research project, you will require an account number from your supervisor.

Each grad office is equipped with a printer. Paper is stored in the Department office (JHE-357), underneath the set of faculty mailboxes. When taking paper, please fill in the form stating your name, supervisor and how many packages you are taking. Your supervisor will be billed at the end of the month. There is no need to ask department staff.

Bulletin Boards/E-mail Messaging
Check your McMaster email regularly for important information such as events, scholarships, courses, and job announcements for graduate students. You can also refer to the bulletin board located outside the Department office for similar postings and on the bulletin boards in each office. It is important that you check your email and/or the notice board regularly to see if anything might apply to you.
SOCIAL INSURANCE NUMBER (SIN)

It is essential that the School of Graduate Studies and Human Resources has your Social Insurance Number (SIN) on your record (for income tax receipt purposes). You will be asked to provide your SIN on the direct deposit forms and Tax Forms. Your SIN is a nine-digit number that you need in order to work in Canada or to have access to government programs and benefits. **If you do not have a SIN number, please apply for one immediately either at:**

Human Resources and Skills Development Canada (HRSDC)
Hamilton Mountain Human Resource Centre of Canada
1550 Upper James Street, Hamilton, ON (corner of Rymal Road)
905-572-2211

Hamilton East Satellite Office
2255 Barton Street East, Hamilton, ON (corner of Nash Road)
905-572-2211

International students need a Canadian SIN to work in Canada. If you hold a Teaching Assistantship (TA), then you will need to take the following documents with you when you apply:

- Your employment contract/Offer letter
- Your passport and study permit
- Completed SIN application form

*Your new SIN card will have the same expiry date as your study permit. Remember to renew both documents at the same time.*

STUDENT AUTHORIZATIONS (for Visa students only)

Visa students are required to provide photocopies of their student authorizations to the School of Graduate Studies and to the Graduate Administrative Assistant when they begin their programs (i.e. at the time of arrival in September, January or May) and each time such authorizations are renewed. Failure to do so will result in the withholding of your payments.

Student permit extensions take some time to process, so plan ahead. Remember that SIN and Study Permits have expiry dates and must be renewed at least three (3) months in advance. The ultimate responsibility for maintaining up-to-date documentation lies with you – the graduate student. Remember also that it is your responsibility to ensure that your passport remains current. Information regarding Study Permits can be accessed from the Citizen and Immigration Canada website: [http://www.cic.gc.ca/english/study/study.asp](http://www.cic.gc.ca/english/study/study.asp)

**Verification Letter Requests**

International students may need McMaster to issue different types of letters for different purposes. International Student Services has put together a list of possible letters you might need. Please visit: [https://iss.mcmaster.ca/immigration/lettersandstatus/#renewstudy](https://iss.mcmaster.ca/immigration/lettersandstatus/#renewstudy)

If you require a letter to verify your status and financial details for work authorization, visas, travel etc. please print and complete the request form found on the Resources page of the MSE Department website. [https://www.eng.mcmaster.ca/materials/resources#graduate-students](https://www.eng.mcmaster.ca/materials/resources#graduate-students)

**NOTE:** Department staff cannot provide information about Visa or Immigration. Students should contact the Immigration and Mobility Advisor from International Student Services. [https://iss.mcmaster.ca/](https://iss.mcmaster.ca/)
HEALTH INSURANCE INFORMATION

All registered students are required to have approved hospital and medical insurance. Medical costs in Canada are very expensive; therefore, having health insurance covered is essential.

Permanent Residents

Permanent residents who require health coverage under the Ontario Health Insurance Plan (OHIP) may obtain application kits from the Ministry of Health Office at 119 King Street West (the 10th floor of the Convention Centre) in Hamilton. The telephone number is 905-521-7100. You will be required to produce three pieces of identification (e.g. birth certificate, driver's license).

Visa Students

The University Health Insurance Plan (UHIP) was created to provide affordable insurance to pay the cost of hospital and medical services that students or employees at participating universities and colleges in Ontario and their families might need to maintain their health while in Canada. The plan provides coverage comparable to that of OHIP for Ontario residents. **UHIP is mandatory for all International students and McMaster University students, employees, and dependents of students and employees who do not have OHIP coverage.**

The plan provides doctors' services, hospital ward accommodation, and all maternity claims even if pregnancy began before arriving in Ontario, and coverage for medical care outside Ontario or Canada.

UHIP for all international students is administered by International Student Services (ISS).

UHIP cards are ready for pickup at the beginning of each academic term. Students are able to pick up their UHIP card from ISS between 2:00 pm and 4:30 pm Monday through Friday (excluding holidays). Student cards are required for UHIP card pickup and must be picked up by the student themselves. Students who are unable to pick up their UHIP cards within the scheduled time period must schedule an appointment by emailing iss@mcmaster.ca with their name, student number and a tentative pickup time.

If you have dependents living in Ontario with you please contact ISS at iss@mcmaster.ca or ext. 24748 for further information on how to register your dependents for UHIP. **Dependents must enroll in UHIP within 30 days of arrival in Canada.**

For more information visit: [https://iss.mcmaster.ca/studentlife/healthcare/](https://iss.mcmaster.ca/studentlife/healthcare/)

Dental Plan

All full-time graduate students who are receiving a TA and/or a RA in lieu of a TA of 130 hours or greater will have Dental Plan premiums deducted each month for the full year (September to August). Provisions for opting-out of the Dental Plan or for obtaining family coverage are covered in a separate document which describes the CUPE Dental Plan. Dental claim forms and opt out forms are available in PDF-format at [http://www.cupe3906.org/wordpress/benefits-forms/unit-1-benefits/dental](http://www.cupe3906.org/wordpress/benefits-forms/unit-1-benefits/dental)

CUPE 3906 Collective Agreement

The position of Teaching Assistant is a unionized one included in CUPE Local 3906 bargaining unit 1, and subject to the terms of the Unit 1 Collective Agreement (the "CA"). The Employer will:

(i) Make copies of the revised Collective Agreement available within one month of the printing of this Agreement in all Human Resources Services Offices and academic units; and
Provide direct access, via an email link, one month after the start of each semester, to a copy of this Collective Agreement to each newly hired employee, at no cost to the employee upon commencement of his/her initial assignment, unless a printed copy is requested by the employee.

The Collective Agreement can be found online at https://cupe3906.org/files/2015/10/CUPE-Unit-1-TA-CBA-FINAL-24FEB2017-1.pdf

NEW GRADUATE STUDENT’S PAYROLL INFORMATION

Teaching Assistantship

If you are to receive a Teaching Assistantship (TA), as indicated in your offer letter, you will be paid bi-weekly by direct deposit, based on when you are scheduled to work. TA payments are typically held in the Fall Term (Term 1) from September to December, 2019 and/or the Winter Term (Term 2) from January to April, 2020. All first time TAs will be required to attend a mandatory training session.

Research Scholarships

Research scholarships paid by supervisors from a research grant will be paid via lump sum installments via direct deposit at the beginning of each term, unless otherwise specified by your supervisor. All other scholarships will be disbursed to the student in lump sum installments via direct deposit at the beginning of each term. Further information about student accounts, timing of payments and payment schedule for the 2019-2020 academic year can be found here: https://gs.mcmaster.ca/sites/default/files/resources/final_package_2019-2020_september_0.pdf

It is important for you to recognize that the Department scholarship support does not extend beyond the twenty four (24) months of a Master’s program. Only under very special circumstances are exceptions made to this policy. For the PhD program, the Department scholarship support period is forty eight (48) months.

SCHOLARSHIPS AND AWARDS

The Faculty of Engineering has a policy ensuring that the gross pay minus tuition of any newly-hired full-time, non-overtime PhD student is a minimum of $16,000. There is no such policy for newly hired, non-overtime Master’s students.

There are three types of additional funding available to graduate students: (1) those that require an application form (major awards) (2) those that are by nomination from the Department (internal scholarships) and (3) a limited number of travel awards that are funded in the current academic year. The timing of most scholarships and award administrative processes takes place in the Fall Term (Term 1) and the successful applicants are notified in the Winter term (Term 2).

The Department strongly encourages graduate students to apply for all external and internal awards. Information and descriptions can be found here: https://gs.mcmaster.ca/awards-funding/awards-funding.

Additional awards are available from the McMaster Engineering Graduate Society (EGS) http://egs.mcmaster.ca/travelawards/ and Graduate Student Association (GSA) https://gsamcmaster.org/gsa-awards/

<table>
<thead>
<tr>
<th>EXTERNAL</th>
<th>Award Name</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario Graduate Scholarship</td>
<td>The Ontario Graduate Scholarship (OGS) and The Queen Elizabeth II Graduate Scholarship in Science and Technology (QEII-GSST)</td>
<td></td>
<td>Varies</td>
</tr>
<tr>
<td>Program Name</td>
<td>Description</td>
<td>Amount</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
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<td></td>
</tr>
<tr>
<td>(OGS)/McMaster Graduate Scholarship (MGS) The Queen Elizabeth II Graduate Scholarship in Science and Technology (QEII-GSST)</td>
<td>Programs provide funding to full-time students at the master's and doctoral levels. They are merit-based scholarships for students with an A- or above average.</td>
<td>$12,000</td>
<td></td>
</tr>
<tr>
<td>Ontario Graduate Fellowship (OGF)</td>
<td>Ontario Graduate Fellowships (OGF) provide funding to full-time students in graduate studies at the masters and doctoral level. It's a merit-based scholarship for students with an A- or above. Canadian Graduate Scholarship Master's or Doctoral (CGS) applicants through McMaster University are automatically considered for these awards.</td>
<td>$12,000</td>
<td></td>
</tr>
<tr>
<td>NSERC – CGS-M</td>
<td>The objective of the Canada Graduate Scholarships-Master’s (CGS M) Program is to help develop research skills and assist in the training of highly qualified personnel by supporting students who demonstrate a high standard of achievement in undergraduate and early graduate studies. The CGS M Program provides financial support to high-calibre scholars who are engaged in eligible master’s or, in some cases, doctoral programs in Canada (refer to Eligibility). This support allows these scholars to fully concentrate on their studies in their chosen fields.</td>
<td>$17,500</td>
<td></td>
</tr>
<tr>
<td>NSERC – CGS – D</td>
<td>The CGS D program supports high-calibre students engaged in doctoral programs in all academic disciplines. This support allows scholars to fully concentrate on their doctoral studies, to seek out the best research mentors in their chosen fields and contribute to the Canadian research ecosystem during and beyond the tenure of their awards.</td>
<td>$35,000</td>
<td></td>
</tr>
<tr>
<td>NSERC – PGS-D</td>
<td>The NSERC Postgraduate Scholarships – Doctoral (PGS D) program provides financial support to high-calibre scholars who are engaged in an eligible doctoral program in the natural sciences or engineering. This support allows these scholars to fully concentrate on their studies and seek out the best research mentors in their chosen fields. Applications to the PGS D program will automatically be considered for the Alexander Graham Bell Canada Graduate Scholarship – Doctoral (CGS D) award, which is offered to the top-ranked applicants; the next tier of meritorious applicants will be offered a PGS D award.</td>
<td>$21,000</td>
<td></td>
</tr>
<tr>
<td>Vanier</td>
<td>The Vanier CGS program aims to attract and retain world-class doctoral students by supporting students who demonstrate both leadership skills and a high standard of scholarly achievement in graduate studies in the social sciences and humanities, natural sciences and/or engineering and health.</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>INTERNAL SCHOLARSHIPS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Dr. Collin Webber Graduate Scholarship</td>
<td>Established in 2013 to honour the memory of Dr. Colin Webber, McMaster University Professor, Physicist, Radiation Safety Expert, Teacher, Mentor, and Leader in the field of bone research. To be awarded by the School of Graduate Studies to master's or doctoral students. Preference will be given to students who demonstrate interest in bone research.</td>
<td>$1,600</td>
<td></td>
</tr>
<tr>
<td>The H.G. Hilton Master’s Scholarship</td>
<td>The H.G. Hilton Master’s Scholarships were established by the income from a bequest in the estate of Hugh G. Hilton, at one time</td>
<td>$3,000</td>
<td></td>
</tr>
</tbody>
</table>
Chief Executive Officer of Stelco and member of the McMaster Board of Governors support a Master’s scholarship. The scholarship is tenable for one year, and is awarded annually to incoming Canadian citizens, permanent residents or, international students from departments which offer full-time Master’s graduate studies. Priority will be given to students intending research in Canadian industry or industrial problems. Other things being equal, preference will be given to deserving children of employees or former employees of Stelco Ltd.

| **The David Alan Reid Kay Memorial Prize** | The David Alan Reid Kay Memorial Prize was established in memory of David Alan Reid Kay, Professor in the Department of Materials Science and Engineering from 1969 to 1997 to perpetuate the spirit of service to the university and materials community, as well as research excellence for which he was so well known. The prize will be awarded annually to a graduate student registered in Materials Science and Engineering based on the criteria above by the School of Graduate Studies on the recommendation of the Chair of the Department of Materials Science and Engineering. |

| **The Dante Cosma Graduate Memorial Scholarship** | The Dante Cosma Graduate Memorial Scholarship was established in 1997 by family, friends and colleagues of Dr. Dante Cosma, in recognition of his years of service in the Faculty of Engineering at McMaster University, and to his support of engineering students in their pursuit of higher education. To be awarded to a graduate student in the Faculty of Engineering by the School of Graduate Studies on the recommendation of the Dean of Engineering. Preference will be given to a student studying metallurgy. |

| **The Dr. W. Smeltzer Scholarship** | The Dr. Walter Smeltzer Memorial Scholarship was established in 2000 by Mrs. Grace Smeltzer in memory of her husband, Dr. Walter William Smeltzer, researcher and professor in Materials Science at McMaster University from 1959 to 1992. The scholarship is to be awarded to a student in the Department of Materials Science and Engineering (MSE) who is deemed to have submitted the most outstanding graduate thesis over the previous two-year period. Ph.D. theses will be recognized in even-numbered years, and Master’s theses recognized in odd-numbered years. The School of Graduate Studies will award the scholarship on the recommendation of the Department of Materials Science and Engineering. |

| **OTHER** |  |

| **Engineering Graduate Society (EGS) Travel Awards** | The EGS Travel Awards are graciously sponsored by the Faculty of Engineering at McMaster University. For the 2018-2019 academic year, $25,000 CAD has been allocated for McMaster Engineering Graduate Students. Awards are valued up to $1,200 CAD; this is dependent on the number and quality of the applications*. |

| **Graduate Student Association (GSA)** | The GSA awards a number of travel awards (up to $500) every semester for travel to conferences to present, or to undertake research relevant to their field of study. GSA Travel Awards are funded from the proceeds of the GSA Development Fund, which is sustained by contributions from Graduate Students and the University. Award recipients will be asked to voluntarily contribute a 250-word statement of how this award and travel contributed to |

| **$500** |  |

| **$1,000** |  |

| **$1,250** |  |

| **Varies** |  |

| **Varies** |  |
their graduate experience, which may be posted on the Graduate Studies and GSA websites and other media sources.

| Wilson Leadership Scholarship Award | The Wilson Leader Scholarship Award for graduate students is different. Valued at up to $25,000, it’s a leadership development and career launcher program that builds on your studies. It involves about 15 hours/month over 6 months – less than a TA or RAship. And it includes experiential learning opportunities. The award program is open to incoming and current McMaster graduate students at all levels whose research and interests relate to democracy, the economy, education, healthcare, the impacts of technology, or public policy in a Canadian context. | Varies |

**POLICY ON MAJOR GRADUATE SCHOLARSHIPS**

For the purposes of this policy, a “major graduate scholarship” includes the following: NSERC, Vanier, OGS, CREATE, QEII GSST, CSC (China), CNPQ-Brazil, KASP (Saudi Arabia), and EAA (Egypt).

In no case can the total support per year provided to the student who holds a major graduate scholarship be less than the Faculty of Engineering minimum stipend or the value listed in the admission letter for the student.

New applicants who brings with them a major graduate scholarship, the total support per year provided to the student cannot be less than the Faculty of Engineering minimum stipend.

If the student is currently enrolled in an Engineering-hosted program and receiving a graduate scholarship from the university, the total stipend currently being provided by the program cannot be reduced by more than $2,500 per term for each term in which the student holds the award (i.e., maximum stipend adjustment of $7,500 per year).

<table>
<thead>
<tr>
<th>Award</th>
<th>Value</th>
<th>Duration</th>
<th>Net Minimum Increase to Student Funding Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFS</td>
<td>$12,000</td>
<td>1 Year</td>
<td>$5,000</td>
</tr>
<tr>
<td>OGS</td>
<td>$15,000</td>
<td>1 Year</td>
<td>$5,000</td>
</tr>
<tr>
<td>NSERC CGS-Master’s</td>
<td>$17,500</td>
<td>1 Year</td>
<td>$7,050</td>
</tr>
<tr>
<td>NSERC CGS-Doctoral</td>
<td>$35,000</td>
<td>2 or 3 Years</td>
<td>$18,200</td>
</tr>
<tr>
<td>NSERC PGS-Doctoral</td>
<td>$21,000</td>
<td>2 or 3 Years</td>
<td>$4,200</td>
</tr>
<tr>
<td>Vanier</td>
<td>$50,000</td>
<td>3 years</td>
<td>$33,200</td>
</tr>
</tbody>
</table>

**SCHOOL OF GRADUATE STUDIES**

In addition to the MSE Graduate Handbook, you are responsible for familiarizing yourself with the School of Graduate Studies Academic Calendar and the School of Graduate Studies website. Here you will find information, policies and procedures as they pertain to you and your Graduate studies.


The School of Graduate Studies - [https://gs.mcmaster.ca/](https://gs.mcmaster.ca/)

The School of Graduate Studies website provides robust pages of information and resources including academic services, awards and funding, news and events. Familiarize yourself with the School of Graduate webpage and the Resources tab. If you have questions about your graduate studies that cannot be answered by the Grad Admin, Associate Chair, Department Admin, you may contact members of the Graduate Studies office by email.
School of Graduate Studies Contact Information

General Questions:  askgrad@mcmaster.ca
Student Records:  sgsrec@mcmaster.ca
Payroll & Graduate Support:  gradpay@mcmaster.ca
Student Accounts (Tuition/Fees):  student.accounts@mcmaster.ca
Thesis preparation & PhD defenses:  gthesis@mcmaster.ca
Scholarship Competitions:  graduatescholarships@mcmaster.ca

SGS GRADUATE STUDENT WELCOME 2019-2020

The School of Graduate Studies would like to welcome all new McMaster Graduate Students. The official Graduate Student Welcome period is scheduled from September 3 to 13, 2019. Join in at events that will introduce you to life as a graduate student at McMaster University, help you meet new people and discover your new school and city.

The Department of Materials Science and Engineering will also offer a Welcome Orientation on Friday, September 6, from 2:00pm – 4:00pm, introducing you to MSE faculty, staff and students. More information will be communicated as it becomes available.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tues, Sept 3</td>
<td>2:00 – 4:00pm</td>
<td>Graduate Student Resource Fair</td>
<td>CIBC Hall (MUSC 3rd Floor)</td>
</tr>
<tr>
<td>Wed, Sept 4</td>
<td>9:00 am – 12:00pm</td>
<td>MacPherson Teaching and Learning Forum</td>
<td>CIBC Hall (MUSC 3rd Floor)</td>
</tr>
<tr>
<td>Thurs, Sept 5</td>
<td>2:00 - 5:00pm</td>
<td>Graduate Research Rounds</td>
<td>Mills Library (2nd Floor)</td>
</tr>
<tr>
<td>Sat, Sept 7</td>
<td>4:00 - 6:00pm</td>
<td>GradParents Family Picnic</td>
<td>Churchill Park</td>
</tr>
<tr>
<td>Mon, Sept 9</td>
<td>2:00 – 4:00pm</td>
<td>Waterfront SoBi Bike Tour</td>
<td>Depart from Student Centre</td>
</tr>
<tr>
<td>Tues, Sept 10</td>
<td>5:00 – 8:00pm</td>
<td>International Student Board Game Night</td>
<td>Celebration Hall</td>
</tr>
<tr>
<td>Thurs, Sept 12</td>
<td>9:00 – 11:30am</td>
<td>NSERC Information Session</td>
<td>Council Chambers (GH-111)</td>
</tr>
<tr>
<td>Thurs, Sept 12</td>
<td>3:30 – 5:30pm</td>
<td>Planting Roots welcome for LGBTQ+ students</td>
<td>Great Hall (University Club)</td>
</tr>
<tr>
<td>Fri, Sept 13</td>
<td>2:00 – 5:00pm</td>
<td>GSA Barbeque</td>
<td>The Phoenix</td>
</tr>
</tbody>
</table>

LEAVES OF ABSENCE, PARENTING LEAVE, FULL-TIME OFF CAMPUS, VACATION TIME

The following is a short summary taken from the Academic Calendar. Please refer to the Calendar for detailed information. With the exception of vacations, forms must be completed.

Leaves of Absence (LOA)
Generally granted on a term-by-term basis. During a leave of absence, your term count stops and you are no longer considered a student. Re-admission does not require any extra paperwork. Students do not pay tuition while they are on a leave, but must pay supplemental fees if they return at any point in the academic year. A maximum of one year over the duration of program of study. No guarantee of funding upon return.

https://academiccalendars.romcmaster.ca/content.php?catoid=37&navoid=7553#2-5-7_leaves_of_absence
Parenting Leave
The parenting leave policy is intended to assist parents in successfully combining their graduate studies and family responsibilities. The duration of the leave will not be counted towards the time limits required to complete or make progress in their graduate studies program.

https://academiccalendars.romcmaster.ca/content.php?catoid=37&navoid=7553#2_5_8_parenting_leave

Full Time Off Campus (FTOC)
Students who will be off campus for more than two-weeks for purposes related to research must apply to be full-time off campus and complete the required form.

https://academiccalendars.romcmaster.ca/content.php?catoid=37&navoid=7553#2-5-6_full_time_on_campus

Vacation
Full-time grad students are expected to be on campus for all three terms of the university year. Normal vacation entitlement is two weeks, to be scheduled by mutual acceptance with the supervisor. An exception to this allotment requires approval from the supervisor.

https://academiccalendars.romcmaster.ca/content.php?catoid=37&navoid=7553#2_5_9_vacations

GRADUATE STUDENTS ASSOCIATION (GSA)

The GSA of McMaster University advocates for the needs of the collective, acts as a resource, and provides support and services that improve the graduate student experience.

Studentcare Health Plan/Dental Plan
Initiated by your student association, the McMaster GSA Health Plan provides students with unique health benefits. The Plan was designed by students for students to provide many important services and cover expenses not covered by a basic health-care plan (i.e. OHIP), or the equivalent (e.g. UHIP for international students) such as prescription drugs, health practitioners, medical equipment, travel health coverage, and more. A comprehensive Dental Plan was added to cover those graduate students who were not covered by the CUPE 3906 Plan (except for Divinity students).

Please note all GSA members are automatically enrolled in the GSA Health and Dental plan and are assessed the fees as part of their supplementary fees paid in September. Students who have a TA and or an RA in lieu of, with 130 hours or more per academic year, will be covered by the CUPE dental are automatically opted out the GSA dental plan. Students will receive a reimbursement cheque in the amount of $170 in December from the GSA health and dental provider, Studentcare.

Students who are covered by an alternative Health and/or dental plan can upload proof of coverage using the Studentcare’s secure website at http://www.studentcare.ca/. Shortly after the Change- of- Coverage Period (Sept. 3rd – 30th 2019), the student will receive a cheque for the premium amount. The breakdown is $186.00 for Health and $170.00 for Dental coverage.

** IMPORTANT **
The opt out dates for Health/Dental Plan are as follows:
Fall Term: September 3rd – September 30th, 2019
Winter Term: Winter: January 6th -31st 2020

Please remember that you need to pay the GSA Health and Dental plan fees on your Student Account. As mentioned above, once you are opted out, you will be receive your reimbursement cheque directly from Studentcare.
Info: http://www.studentcare.ca/
Hamilton Street Railway (HSR) Bus Pass – Presto
All eligible NEW students can pick up their free blank PRESTO cards at the campus store - you must present your valid McMaster Student ID card to receive your Presto card. Students cannot start using their 2019/2020 Bus Pass/Presto cards until Sept 1, 2019. Use prior to this date will cause PRESTO “My Account” to be in a negative balance, and not work correctly. THEREFORE, between August 23 – 31, students only need to show their Student ID card to the HSR bus driver to board the bus.

ONCE YOU RECEIVE YOUR NEW HSR UPASS / PRESTO CARD, PLEASE REGISTER YOUR NEW CARD ONLINE. Part-time students and Engineering Co-op Students are not eligible for the HSR bus pass. Presto cards are valid only in the Fall and Winter term.

INTERNATIONAL STUDENT SERVICES

International Student Services (ISS) is an active and essential part of Student Affairs. As a student-centered service, our mandate is to deliver services to international students and internationally-minded Canadian students using a collaborative and integrated approach to learning. We provide an inclusive and positive environment for all students.

Services Include:
- Cultural transition support
- Referral services on issues related to Citizenship and immigration Canada (CIC), employment, access to Service Canada resources, Canada Revenue Agency (CRA), administration of the University Health Insurance Plan (UHIP) and settlement support
- New student orientation and cross-cultural information
- Mentorship program
- Implementation, promotion and processing of applications for exchange programs to and from several universities around the world
- Advice for internationally-minded Canadian students on study / work / intern and volunteer abroad opportunities
- Workshops and information sessions on practical educational topics that are not taught in classrooms, such as how to enhance the university student experience, opportunities to get involved in the community (the key to a successful adjustment to Canada), cultural adaptation issues, and how to improve writing skills
- Outdoor activities for international and exchange students

We are committed to developing a collaborative approach to learning with both international and domestic students. As partners in learning, our goal is to provide an environment in which all students can have a memorable experience at McMaster.

STUDENT WELLNESS CENTRE

The Student Wellness Centre is the place on campus to address your wellness needs. We provide a range of counselling options, medical services and wellness programs so that you can get the most out of your McMaster experience, academically and personally! If students have questions about any of the programs, they are free to email wellness@mcmaster.ca and the response time is normally within 24 hours.

Counselling

Our experienced counselling staff will sit down with you in a consultation appointment and explore with you what your needs are and some of the best and most effective ways to address those needs.
Medical

Our medical team, made up of nurses, family medicine doctors and specialist doctors, provide a wide range of health services to provide you with personal health care during your time at McMaster.

Wellness

Our wellness education team provides health and wellness prevention and awareness programs to connect you with information, resources and services in the McMaster and Hamilton community.

Mental Health – Empower Me Program

There are both workshops and drop-ins available for students. There is also a mental health nurse staffed at the Wellness Centre full-time. Empower Me is offered specifically for Graduate students. There are 24/7 accessible counselling services available to empower you to thrive, crisis support, mental health and well-being services.

It is not recommended that students email about a crisis. In a crisis you can call one of the following:

COAST – 905-972/8338, available 24/7)
- Free and confidential
- Hamilton Line for adults in crisis, their family members and caregivers
- Management plans to defuse crisis situations

EmpowerMe – 1-844-741-6389, 24/7)
- Counsellors for crisis and non-crisis

Info: https://wellness.mcmaster.ca/

STUDENT ACCESSIBILITY SERVICES

Student Accessibility Services (SAS) provides academic accommodation assistance and related supports to students with disabilities at McMaster. SAS is available to assist students transitioning from high school, other post secondary institutions, undergraduate, continuing and graduate students.

Reminder: Approved accommodations of previous undergraduates at McMaster do not automatically apply during graduate studies. Students needing accommodations should return to SAS soon after commencement of their graduate program to implement or update your student status and to activate accommodations.

Info: http://sas.mcmaster.ca/

For a listing of the central services/resources that are available to you as a graduate student, please visit the following website for a listing of services/resources and the specific link to the individual websites:

MOSAIC STUDENT CENTRE

McMaster’s on-line MOASIC Student Center provides access to the following academic, personal and financial information:

<table>
<thead>
<tr>
<th>Academics:</th>
<th>• Class Search</th>
<th>• Course History</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Academic Planner</td>
<td>• Enrollment/Financial Letters</td>
<td>• Grades</td>
</tr>
<tr>
<td>• Enrollment</td>
<td></td>
<td>• Transcripts - instant access to unofficial transcripts and ability to order official transcripts</td>
</tr>
<tr>
<td>Class Schedule - List &amp; Weekly views</td>
<td>Program/Plan/Sub-plan Selection</td>
<td>Academic Advising</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td><strong>Finances:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Account Inquiry</td>
<td>Charges Due</td>
<td>View/Print T2202A/T4A</td>
</tr>
<tr>
<td>Make a Payment</td>
<td>Enrollment/Financial Letters</td>
<td>Travel Expense Reimbursement</td>
</tr>
<tr>
<td><strong>Personal Information:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change mailing address</td>
<td>Add emergency contacts</td>
<td></td>
</tr>
<tr>
<td><strong>Scholarships/Financial Aid:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unified application for many scholarships and bursaries</td>
<td>Application to determine eligibility for work/study positions</td>
<td></td>
</tr>
</tbody>
</table>

To access these services, you need to activate your MAC ID account and enable your MAC ID services.

For a complete description of all of these services, and managing your MAC ID visit the MAC ID homepage at: http://www.mcmaster.ca/uts/macid

**Enabling Your MAC ID Services**

MAC ID is your McMaster username that is unique to a student and is used to access various McMaster resources such as:

- UTS Student Labs
- Wireless Access on Campus
- McMaster Email Account
- Avenue to Learn
- Online Voting System

Applicants are preassigned a MAC ID upon applying to McMaster University. An applicant must enable their MAC ID by going to MOSAIC and selecting “Enable you MacID services”

https://www.mcmaster.ca/uts/students/gettingstarted/activateMACID.html

**Password**

Choose a strong password: it has to be at least eight (8) characters long, and has to include at least one character from two of the four groups below:

- Uppercase letters: A, B, C, ...Z
- Lowercase letters: a,b,c, ..z
- Numerals: 0,1,2,3,4,5,6,7,8,9
- Symbols on the keyboard that aren't letters or numerals: ~ ! @ # $ % ^ & * ( )_ + - = { } \ | ": ; ' < > ? , . /

Set your challenge questions (used if you forget your password, and need to reset it).

For assistance, please contact the Technology Service Desk at: Extension 24357 | uts@mcmaster.ca

**MCMASTER ENGINEERING GRADUATE SOCIETY**

McMaster Engineering Graduate Society

The Engineering Graduate Society (EGS) at McMaster University was founded in 2014 to represent Engineering Graduate Students at McMaster University. We liaise with McMaster’s Faculty of Engineering, Graduate Student Association (GSA), Science Graduate Association (SciGSA, formerly SAM), the undergraduate McMaster Engineering Society (MES), our Union (CUPE 3906), and the School of Graduate Studies (SGS) to ensure that Engineering Graduate Students’ interests are heard.
The EGS Council is composed of 27 Council seats — 3 representatives from each Engineering Department — of which there are 10 Executive positions. EGS Council members will also be elected to sit on a variety of External Committees and Councils at the Faculty and University level; some of which are:

- Graduate Curriculum and Policy Committee (GCPC): A committee which votes on curriculum and policy changes for Graduate programs. The EGS representative voices the Engineering Faculty.
- Graduate Council — a subcommittee of the Senate which all policies related to Graduate Students are discussed.
- Faculty of Engineering Membership — a venue for Graduate Student leaders (EGS), Undergraduate Student leaders (MES), and the Faculty of Engineering to discuss pertinent topics of state, potential collaboration opportunities, and overall cohesiveness. This is led by the Dean of Engineering.
- GSA Council — dealing with all matters pertaining to graduate students, supplementary fees, social events, Alumni relations, etc...
- The Senate — responsible for determining academic policy and regulating the system of education, economics, staffing, etc... *a separately elected position* (i.e. you must run independently to achieve this position).


**GRADUATE COURSES REQUIREMENTS**

The requirements listed below only apply to in-coming students with a September 2019, January 2020 or May 2020 start. For in-course students, you need to refer to the graduate course requirements stated in the School of Graduate Studies Calendar issued for the year of your start. For example, if you started in September 2016, January 2017 or May 2017, then the School of Graduate Studies Calendar, 2017-2018 needs to be consulted. In the event of a discrepancy between the information provided in this handbook and the School of Graduate Studies Calendar, the latter prevails.

**Master’s Degree**

Master’s students are required to successfully complete at least 12 units of course work, which must include the mandatory seminar half course (3 units) MATLS 701. Courses at the 700 level are offered as either a half course (3 units) or a quarter course (1.5 units), whereas courses offered at the 600-level are offered as half courses (3 units). Only one 600-level course is allowed for graduate credit. Only one non-technical half course (3 units) is permitted with written approval from the supervisor. The passing grades for a graduate level course are A+, A, A-, B+, B, and B-.

**PhD Degree**

Students entering the PhD program in the Department directly with a Bachelor’s degree are required to successfully complete at least 12 units (4 half-courses) of course work, which includes the mandatory seminar course MATLS 702 (3 units) and 6 units of technical courses at the 700 level. Courses at the 700 level are offered as either a half course (3 units) or a quarter course (1.5 units), whereas courses offered at the 600-level are offered as half courses (3 units). Only one 600-level course is permitted for graduate credit. Only one non-technical half course (3 units) is permitted for graduate credit with written approval from the supervisor.

Students entering the PhD program in the Department with a Master’s degree are required to successfully complete at least 12 units (4 half-courses) of course work, which includes the mandatory seminar course MATLS 702 (3 units) and 6 units of technical courses at the 700 level. Courses at the 700 level are offered as either a half course (3 units) or a quarter course (1.5 units), whereas courses offered at the 600-level are offered as half courses (3 units). Only one 600-level course is permitted for graduate credit. Only one non-technical half course (3 units) is permitted for graduate credit with written approval from the supervisor.

Students transferred to the PhD program from the Master’s program in the Department are required to successfully complete at least 12 units (4 half-courses) of course work, which includes the mandatory seminar course MATLS 702 (3 units) and 6 units of technical courses at the 700 level. Courses at the 700 level are offered as either a half course (3 units) or a quarter course (1.5 units), whereas courses offered at the 600-level are offered as half courses (3 units). Only
one 600-level course is permitted for graduate credit. Only one non-technical half course (3 units) is permitted for graduate credit with written approval from the supervisor. The passing grades for graduate level course are A+, A, A-, B+, B, and B-.

Courses Outside Department

Students are encouraged to consult with their Supervisor to select some of their courses from areas beyond the focus of their research, including courses offered by other Departments. For courses to be taken for credit outside of the Department, but within the Faculties of Engineering, Science and Health Science, written approval from the Supervisor is required. Any other courses for credit require approval from the Associate Dean Graduate Studies (Engineering). The passing grades for such graduate level courses are A+, A, A-, B+, B, and B-.

Graduate students are normally required to complete their course degree requirements by taking courses from within their program (Department of Materials Science and Engineering in this case). As a minimum, at least 50% of courses taken must be listed or cross-listed by the Department’s (Materials Science and Engineering) program in order to be counted towards your degree. Courses taken outside of the Faculty of Engineering and not listed as part of the degree requirements require the permission of the Associate Dean – Graduate of the Faculty of Engineering or their delegate to be counted towards the degree.

Department Course Offerings 2019-2020

**All courses scheduled to be offered can be found on our website and MOSAIC**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
<th>Hours</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATLS 6I03</td>
<td>Sustainable Manufacturing</td>
<td>Fall</td>
<td>3 Units</td>
<td>6NN3</td>
<td>Computer Modelling in Materials</td>
<td>Winter</td>
<td>3 Units</td>
</tr>
<tr>
<td>MATLS 6P03</td>
<td>Properties of Polymeric Materials</td>
<td>Fall</td>
<td>3 Units</td>
<td>6T03</td>
<td>Property &amp; Process Composites</td>
<td>Winter</td>
<td>3 Units</td>
</tr>
<tr>
<td>MATLS 701 (Master’s)</td>
<td>Graduate Seminar (Master’s)</td>
<td>Fall</td>
<td>3 Units</td>
<td>MATLS 701 (Master’s)</td>
<td>Graduate Seminar (Master’s)</td>
<td>Winter</td>
<td>3 Units</td>
</tr>
<tr>
<td>MATLS 702 (PhD)</td>
<td>Graduate Seminar (PhD)</td>
<td>Fall</td>
<td>3 Units</td>
<td>MATLS 702 (PhD)</td>
<td>Graduate Seminar (PhD)</td>
<td>Winter</td>
<td>3 Units</td>
</tr>
<tr>
<td>MATLS 715</td>
<td>Solidification Processing</td>
<td>Fall</td>
<td>3 Units</td>
<td>MATLS 725</td>
<td>Transmission Electron Microscopy</td>
<td>Winter</td>
<td>3 Units</td>
</tr>
<tr>
<td>MATLS 723</td>
<td>Functional Materials</td>
<td>Fall</td>
<td>3 Units</td>
<td>MATLS 730</td>
<td>Xrd2 &amp; Xrd3 Diff Mtds for Mtl</td>
<td>Winter</td>
<td>1.5 Units</td>
</tr>
<tr>
<td>MATLS 724</td>
<td>Materials Characterization</td>
<td>Fall</td>
<td>3 Units</td>
<td>MATLS 792</td>
<td>Nano-Structured Electronic Materials</td>
<td>Winter</td>
<td>3 Units</td>
</tr>
<tr>
<td>MATLS 734</td>
<td>X Ray Theory</td>
<td>Fall</td>
<td>1.5 Units</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that the course enrollment process will automatically assign a course towards the primary academic program that a student is enrolled in for a particular term. This process does not determine whether the course will exceed the requirements outlined in the curriculum. Where a student wishes to designate a particular course towards a program other than their primary academic program a Request for In-Program Course Adjustments form is required during the normal add period outlined in the sessional dates.


Extra Courses (Extra Course)

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

Courses that are required by the supervisory committee or the Department Chair as additional requirements in excess of the stated minimum for the program must be designated as Master’s or PhD.


Failing Grades and Incomplete Grades

Please see the Academic Calendar for Failing Grades and Incomplete grades. https://academiccalendars.romcmaster.ca/content.php?catoid=25&navoid=4667#2.6.4_Failing_Grades_and_Incomplete_Grades

SGS 700 Research/Writing (Full-Time)

MOSAIC requires students to be enrolled in a course, in every term that they are an active student. If there is a term in which the student is not taking a course, the student needs to enroll in SGS 700. This applies to course based and thesis based students. If the student is not enrolled in this course, during a term in which they are not taking anything else, Mosaic will class that student as no longer being active and this will prevent them from moving onto the next academic year. It will also make a transcript read incorrectly, should students need transcripts for scholarships or applications to other degree programs. This does not apply to students who are on a leave of absence.

Once a student has this course in their term, they cannot add another course to the that term. If they originally planned not to take a course in that term or planned to work on their thesis for that term and put SGS 700 on their record, should they change their minds and want to take a course, they must first drop the SGS 700 course before the system will allow them to add anything else.

Students fees in MSE are assessed on a per-term based structure. Students with per course based fees will not see a financial impact from adding this course.

MANDATORY COURSE REQUIREMENTS

MSE Graduate Seminar (MATLS 701/702) – Attendance is Mandatory

The Department holds a regular meeting, which incorporates the Graduate Seminar, featuring oral presentations by registered graduate students (MATLS 701 or MATLS 702) and by visitors and fulltime researchers.

Each student is required to prepare and present a major seminar, based upon extensive research work and literature surveys, on any topic of current research interest in Materials Science and Engineering. A pass/fail grade will be assessed based on overall performance in the course.

MATLS 701 (Master’s)
- One (1) seminar required, usually in Year 2 of program.
- Enroll in Mosaic. Watch for communication from Grad Admin.

MATLS 702 (PhD)
- Two (2) seminars required, usually in Year 2 and Year 4 of program.
• Registration required for first (1st) seminar (do not enroll in Mosiac). Watch for communication by Grad Admin.
• Enroll in Mosaic for second (2nd) seminar. Watch for communication from Grad Admin.

NOTE: There is a permission placed on the course when enrolling in Mosaic simply to prevent students from registering for this course more than they need to.

Career Planning - Mandatory

Entering graduate students in Master’s or PhD programs within the Faculty of Engineering are required to complete a career planning exercise within their first academic year (September to August). The courses is a one time only course facilitated by Engineering Career and Co-Op services. Students will receive communication about course registrations and will register in a course via Oscar. Subsequently, the student will produce and (at most) a two-page report before the end of their first year (Year 1). This report is to be submitted to the Grad Admin to be updated in Mosaic.

SGS MANDATORY COURSES

All graduate students at McMaster are required to complete the following two (2) on-line courses available within McMaster’s Avenue to Learn software within their first academic term:

SGS 101 – Academic Research Integrity and Ethics
SGS 201 – Accessibility for Ontarians with Disabilities Act – AODA Training

Anyone who has not completed either of the following courses by the deadline provided by SGS will be automatically assigned an F grade. Each course takes approximately one hour to complete and consists of watching an online presentation followed by a test.

Check your MOSAIC Student Centre to ensure that you are registered in these courses. If they do not appear in your course schedule or in Avenue to Learn, please contact the School of Graduate Studies (SGS) at sgsrec@mcmaster.ca

SGS will block all access to future registration if this requirement is not met by the end of the Fall Term (Term 1).

Notes
• Passing grade for SGS 101 is 14/20 and students have three (3) attempts.
• Passing grade for SGS 201 is 6/6 and currently there is no limit to the number of attempts.
• Students who have taken SGS 101 and 201 for a previous graduate degree do not need to take the course again.
• Any student who has taken an AODA equivalent course, either previously at McMaster (e.g. undergraduate welcome week rep) or at another institution, should contact aoda@mcmaster.ca. They will confirm that this is either complete or equivalent. Please then forward this confirmation to sgsrec@mcmaster.ca. Students in this situation do not need to retake SGS 201.

MANDATORY SAFETY TRAINING

Below is a list of the mandatory safety training every graduate student must take:

1. WHMIS 2016
2. Asbestos Awareness
3. Fire Safety
4. Ergonomics
5. Slips, Trips and Falls
6. Chemical Handling and Spills
7. Health and Safety Orientation
8. Violence and Harassment Prevention
9. Job Hazardous Analysis
Additional safety courses such as, Machine Guarding, Gas Cylinder and Hydrogen Fluoride are required if the hazard is present. Please discuss the need for additional safety courses with your supervisor.

Health and Safety training can be completed online through MOSAIC under “Regulatory Training”:

https://epprd.mcmaster.ca/psp/prepprd/?cmd=login&languageCd=ENG

**Please complete these courses as soon as possible**

**WHMIS TRAINING SESSIONS**

**This course is mandatory for all incoming graduate students**

The WHMIS legislation makes it mandatory that all employees attend a short course (approximately three hours in duration), which will provide basic information. WHMIS Core is for individuals handling chemicals working in a lab environment. It is intended to provide necessary and required training to all who use department laboratories. The Workplace Hazardous Materials Information System (WHMIS) is a comprehensive national system for safe management of hazardous chemicals which is legislated by both the federal and provincial jurisdictions.

WHMIS is mandatory training for anyone working with or in the proximity of hazardous materials. The WHMIS legislation provides that workers must be informed about the hazards in the workplace and receive appropriate training to enable them to work safely. To accomplish this, WHMIS requires all suppliers (manufacturers, importers, packagers and processors) to label and prepare Material Safety Data Sheets (MSDSs) for products they make, import, package, or process that meet the hazard criteria set out in the Controlled Product Regulations under the federal Hazardous Products Act. The buyers of these controlled products must make sure that these products are correctly labeled and that MSDSs are available.

Employers must set up worker education programs that instruct workers about the contents and significance of labels and MSDSs and how to work safely with hazardous materials. In summary, WHMIS delivers the necessary information by means of:

- Cautionary labels on containers of controlled products
- The provision of an MSDS for each controlled product
- A worker education program

The ultimate goal is to create a safer workplace by providing workers with the knowledge and tools to enable them to work safely. Please visit the web site listed below for all courses and to register:

http://www.workingatmcmaster.ca/eohss/training/index.php

**You must complete WHMIS training before you can work in the lab**

**JOB HAZARD ANALYSIS FORM**

A component of the Workwell audit criteria requires McMaster to provide a documented job hazard analysis of main activities associated with each worker. A job hazard analysis is essential in clarifying the work to be done in conjunction with the hazards and controls that are associated with the activity. While reviewing a list of the main activities involved with each job, common hazards are identified. If a hazard cannot be eliminated it needs to be minimized before the job is performed. Hazards can be minimized by implementing controls such as personal protective equipment, written procedures or training.

The form can be completed on the web at the following link: http://www.mcmaster.ca/workwell/
Both you and your supervisor must review and sign the summary page and then submit it to the Grad Admin.

The main likely types of potential hazard encountered in the laboratory include but are not limited to:

- Fire/Explosion: List the flash point and the auto ignition temperature.
- Toxic (usually comprises chemicals): Review of all associated Safety Data Sheets (SDSs) is mandatory.
- Radioactivity: List the acceptable exposure values.
- Electrical
- High Pressure
- Mechanical
- Falling Objects

DEPARTMENT SAFETY AND PROCEDURES

The Lab Safety Handbook
This is mandatory reading for all employees, graduate students and volunteers working in laboratories. This handbook applies to all campus labs.

https://hr.mcmaster.ca/employees/health_safety_well-being/our-safety/lab-safety/

New Employee or Student Safety Orientation Checklist (RMM 300 FORM)
Make an appointment with your supervisor to discuss the roles, responsibilities, procedural guidelines, record keeping and mandatory safety training matrix.

Reporting of a Safety Incident
Any incident, which could have resulted in injury, must be reported to the Department immediately. Please advise your supervisor as soon as possible and see the Department Administrator for a McMaster University Injury/Incident Report form. These must be completed as soon as possible.

Fire Safety Procedure
In the case of fire, or the sounding of an alarm, “Get Out And Stay Out”. You should be at least 50 feet away from the building and not return until the “All Clear” is given. Department Fire Wardens have been designated and can be identified by orange vests.

Security
Please be security conscious. Do not leave personal valuables in your office or desk. Keep all books, notes, etc. locked in your locker. Do not share your keys or invite others to the graduate student offices or other department facilities. So that no rooms are left unattended, the last person leaving an office should lock the door. Do not give your copier code to anyone. Do not reveal your computer password to anyone. If you suspect that it is compromised, change it immediately.

Emergency
The McMaster Security office is located in E. T. Clarke 201 and can be contacted at ext. 24281. This office is responsible for overall security on campus. In addition they operate a Lost and Found service (ext. 23366). Any lost items will be held by them for 60 days.

**IN CASE OF EMERGENCY DIAL 88**
MASTER’S DEGREE REQUIREMENTS

Supervisory Committee Meeting

Each Master’s student will meet with their supervisor and one additional faculty member (Supervisory Committee) to assess the progress of their studies and set goals. For students who are accelerated, this review should really be given once they start the Master’s degree to help them get started, but otherwise within eight (8) months of starting. For a normal 24 month Master’s degree, it is MANDATORY that such a meeting take place prior to completion of 12 months in the program. Part-time students must also receive a review after their first year in the program.

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<tr>
<th>Deadline for Supervisory Committee Meetings</th>
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<td><strong>If the student was admitted in:</strong></td>
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<td>September</td>
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Master's Thesis Defence

This is an oral exam administered by the Department. This is a PUBLIC examination open to all interested persons. It is conducted by a minimum of three faculty members (including the supervisor). The exam covers material presented in the written thesis and the background material to this thesis. It is normally taken by students who intend to leave the program upon completion of their Master’s degree. After a short oral presentation, the student is asked to defend the contents and background to the written thesis. After a discussion of the examination, the Chair will ask for a vote on the success or failure of the defence. If the examiners approve the defense, the Chair will ask the examiners to complete the Examination Report by initializing appropriately. The student will be invited back to the examination room for congratulations by the committee. In the event that minor revisions are required to the thesis, the Chair of the examination committee is responsible for ensuring that (1) the student is advised of the revisions, (2) the student receives and understands the ‘Final Thesis Submission form’ to be used by the supervisor to confirm that the revisions have been made, and (3) the supervisor is also aware of the form. The Chair will complete and sign the Examination Report and return it to the Graduate Administrative Assistant, whom will return it to the School of Graduate Studies.

However, if there are two or more negative votes, the student will be deemed to have failed the defence, and a reconvened oral defence must be held at a later date. The student should be told as clearly as possible by the Chair and the examining committee what he/she must do to improve the defence. The reconvened defence is the student’s final opportunity to complete the degree. Membership on the reconvened examining committee should be the same as that for the original defence. If the defence fails a second time, that decision is final, and is not open to appeal.

After a successful defense, the student must correct any errors detected by the readers to the satisfaction of the Supervisor and then submit an electronic copy to the School of Graduate Studies via MacSphere (see Section 2.8.3 - Publication of Electronic Theses at McMaster University). Students are normally expected to submit their final thesis within four weeks of a successful defence.

To initiate your Master’s thesis defence, send your Grad Admin an email a minimum of 4-weeks with a working title, the name of your Supervisory Committee Members and an anticipated defence date. The Associate Grad Chair will then assign a chair for the defence. All members of the examining committee must receive a copy of your final thesis report a minimum of 2-weeks prior to the defence.

Tuition fees continue to be assessed until all degree requirements are met, including the successful submission of the final approved thesis to MacSphere.

Transfer Exam from Master's to PhD

https://academiccalendars.romcmaster.ca/content.php?catoid=39&navoid=8154#2-1-3-_transfer_to_phd
Complete regulations for this exam are in the Graduate Studies Calendar under admission to a PhD program. The student submits five typed copies of a research report, which should take the form of a literature review plus some preliminary results and analysis followed by a detailed research proposal. The literature review should not simply catalogue the papers in the field. Rather it should offer some insight into the state of the field (i.e. what are the main advances achieved, what are the main problems which occur, what is good or bad about the approaches taken by previous workers). This should lead into a discussion of what approach you intend to take in your own research. What will you want to do different from previous research, and what advances in the state of the art do you hope to achieve? Some discussion of the techniques you expect to use will be important. You will be expected to demonstrate that you have thought about how best to approach your problem, and what its limitations may be. The report need not, and indeed should not, be a lengthy document. It should however indicate that you have a good grasp of the background to the project being undertaken, have demonstrated a potential to perform research, and have thought carefully about the research being proposed.

Transfer reports must be submitted at least one month before the end of the sixth term (24 months) registration in a Master’s program. Failure to meet this deadline means that the student will be overtime before the transfer exam is taken, resulting in loss of income and status as a full-time student. The committee for a transfer examination normally comprises five faculty members. The purpose of this exam is to determine whether the student has a good chance of successfully completing a PhD. It also serves the valuable function of providing a good appraisal of the problem chosen for research. After a discussion of the examination, the Chair will ask for a vote on the success or failure of the transfer. If the examiners approve the transfer, the Chair will ask the examiners to complete the Transfer Exam Report by initialing appropriately. The student will be invited back to the examination room for congratulations by the committee.

However, if there are three or more negative votes, the student will be deemed to have failed the transfer exam and a reconvened oral exam must be held at a later date. The student should be told as clearly as possible by the Chair of the examining committee what he/she must do to improve the defence of the transfer. The reconvened defence is the student’s final opportunity to complete the transfer. Membership on the reconvened examining committee should be the same as that for the original exam. If the exam fails a second time, that decision is final, and is not open to appeal. The student is then expected to complete the Master’s degree by written a thesis and defending it in an oral defense exam.

So what is required of a potentially good PhD student? Obviously knowledge as such has some importance but it is not of prime importance. In asking students to write a summary of their research proposal, we essentially are asking them to ask themselves questions such as:

- **Why am I doing this research, i.e. what is the essence of the problem? How does my proposal relate to previous work?**
- **What form of measurement will I use or what theoretical basis will I assume?**
- **Do I really understand this form of measurement, i.e. the basic science behind it, the accuracy and sensitivity required, etc?**
- **What alternative measurements or techniques could I use and why have I rejected them in favour of the one proposed?**
- **Can the problem be modeled, and on what basis?**

In short, does the student have the interest and capability of a scientist or engineer who can analyze a problem with complete understanding, or is the student prepared only to look at it superficially, with uncritical adoption of other people’s opinions? Of course, the answers to everything cannot be known or there would be no point in doing the research, but the questioning by the student of what is important, should have been done. A PhD degree demands maturity on the part of the student and the student should be able to take over the problem from his supervisor. It is, after all, an indication of the ability to do independent research.

Following completion of the transfer exam students will either be granted direct transfer into a PhD program or else they will be required to complete their research and submit this work for a Master’s degree.
PhD DEGREE REQUIREMENTS

The Department makes extensive use of oral examinations for the defence of thesis and for testing the comprehensive background of students. Regulations related to these exams are contained in the Graduate Studies Calendar. This section provides further details including the form and content of these exams. Failure in any oral examination is grounds for requesting that the student withdraw from the program. However, at the discretion of the Department, students may be granted a second attempt at an examination. If you have questions about what is expected of you in any of these exams you should approach your supervisor and/or the Associate Chair – Graduate (Dr. Gianluigi Botton), well in advance of the exam.

Supervisory Committee Meeting

The supervisor and student have a mutual obligation to meet on a regular basis, the Department shall ensure there is a formal regular meeting of each PhD supervisory committee at least once within the academic year (September-August), and possibly more often, to discuss the student’s progress. Each PhD supervisory committee must report annually on the student’s progress and the Associate Chair – Graduate must forward such reports to the School of Graduate Studies. The report formally documents the supervisory committee’s assessment of the progress of the student’s program.

Supervisory Committee Reports are completed using the Online Reporting form. Students are responsible for coordinating a date and time for their committee meeting and then inform the Grad Admin. The Grad Admin will initiate the Online Supervisory Committee Report. Students and Supervisors are responsible for the completion of the meeting using the online reporting system.

A step-by-step guide is available on the Resources page of the MSE website.

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Comprehensive Examinations for PhD Students

Comprehensive exams are meant to test the student’s background understanding in various areas of Materials Science and Engineering. It is important to realize what is expected of you in this type of examination. First of all, they are not designed simply to see how much you have remembered from your undergraduate program, although knowledge of key terminology and basic facts is important. These exams will test your ability to think and to question, and to elaborate fundamental concepts. The questions will probe your ability to work with and develop concepts. Therefore, it is the process, which is important, as much as the result. Always keep this in mind during the examination. Do not be concerned if you do not immediately know the final answer to a question you are asked. Start with some basic concept or a simple first order equation and work towards the solution. This will demonstrate to the committee your ability to think and to develop concepts. Make extensive use of the blackboard to draw simple diagrams or to write down equations. As you prepare for these exams, try to develop a good fundamental understanding of basic concepts, and you should do well.

Part I Comprehensive Examination

The comprehensive examination is designed to ensure that all students who receive a Ph.D. degree in Materials Science or Engineering have a broad understanding of the foundations of the discipline. The key to this approach is an emphasis on fundamental concepts. Students will not be expected to demonstrate a very detailed knowledge of materials processes, or of the properties of any given material. However they will be expected to understand the broad classes of materials - how their underlying structure controls properties and affects the approaches used to process them, etc. It is considered essential that all students demonstrate an appreciation for the interrelationships between structure/properties/processing of materials. The content that students must be able master is best illustrated by referring
to sections in classical textbooks. Students are of course free to study use other books with which they are more comfortable. However, the book chapters given below offer guidance as to both the nature and the depth of the content required.

You must receive three positive votes to pass. If there are two or more negative votes on either the core content or either of the two technical electives content, the student will be deemed to have failed that portion of the exam and a reconvened oral exam must be held at a later date. The student should be told the topics requiring improvement as clearly as possible by the Chair of the examining committee. The reconvened exam is the student’s final opportunity to pass this comprehensive exam. Membership on the reconvened examining committee should be the same as that for the original exam. If the exam is failed a second time, that decision is final, and is not open to appeal.

Comprehensive Exams will take place approximately 8 months from admission entry.

<table>
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<tr>
<th>Estimated time for Comprehensive Exam</th>
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The Part I comprehensive exam topics are divided into core areas that all students are responsible for and elective areas in which students may choose their area of specialization.

Overview of thematic areas

Core areas:
- **Structure of Materials** (including atomic structure and bonding and defect structures) - Callister\(^1\) Chs. 2 and 4
- **Thermodynamics** (with emphasis on solution thermodynamics and phase equilibria) - Ragone\(^2\) Chs. 1-5 and 7-9, Callister Ch 9 [Gaskell Ch. 2, 3, 7, 9, 11-13]
- **Kinetics** (including mass transfer and phase transformations) - Callister Chs. 5, 10

Elective Areas:
- **Structure of Materials.** Choose one of:
  - Crystalline solids - Callister Ch. 3
  - Polymeric solids - Callister Ch. 14
- **Properties of Materials.** Choose one of:
  - Mechanical properties - Callister Ch. 6, 7, 8
  - Electrical and thermal properties - Callister Ch. 18, 19
  - Chemical properties - Ragone Ch. 6

This exam is normally offered in January (September starts), May (January starts) and September (May starts). However, students may arrange to take the comprehensive examination at any time, following discussion with the Chair. Students must successfully complete this examination within 12 months of initial registration. Students may be granted a second attempt, but the second attempt must be in this 12 month period. Thus, students should take this examination at the earliest opportunity. Special consideration may be given for part-time students.

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\(^{2}\) David V. Ragone, *Thermodynamics of Materials Vol. 1*, 1995, Wiley. has been selected as the primary source for this material because it is fundamental and concise. However, many students may be more familiar with David R. Gaskell, *Introduction to the Thermodynamics of Materials*, 3\(^{rd}\) Ed., 1996, Taylor and Francis, so cross-references are made in square brackets.
Detailed synopsis – key concepts

While the following is not meant to be an exhaustive list of topics that might be raised, it lists key concepts with which you should be familiar.

1. Structure of Materials
   a. Atomic structure and bonding – Callister Ch. 2
      i. Atomic bonding forces and energies
      ii. Bonding types
      iii. X-ray analysis for chemical composition determination
   b. Crystalline solids – Callister Ch. 3
      i. Concept of a crystal, unit cell
      ii. Common structures including fcc, bcc, hcp, tetragonality
      iii. Miller indices for directions and planes
      iv. Physical basis of x-ray diffraction and Bragg’s law
      v. Meaning of crystalline anisotropy
   c. Defect structures – Callister Ch. 4
      i. Vacancies
         1. Thermodynamic properties
         2. Vacancy concentration
      ii. Dislocations (edge, screw, mixed)
      iii. Interface defects (free surfaces, low and high angle grain boundaries, twin boundaries)
   d. Polymeric solids – Callister Ch. 14
      i. Structure of common monomers (e.g. alcohols, ethers, acids, aromatic hydrocarbons)
      ii. Basic concepts in polymers (homo- and co-polymers, functionality
      iii. Molecular weight
      iv. Polymer types (linear, branched, crosslinked, network)
      v. Thermosets vs. thermopolymers, effect of basic properties
      vi. Crystallinity in polymers
      vii. Characterization of polymer structure

2. Thermodynamics
   a. First Law of Thermodynamics – Ragone Ch. 1 [Gaskell Ch. 2]
      i. Energy as a State Function
      ii. Work
      iii. Intensive and Extensive Properties
      iv. Enthalpy
      v. Heat Capacity
      vi. Ideal Gases
      vii. Enthalpies of Formation and Chemical Reaction
   b. Second Law of Thermodynamics – Ragone Ch. 2 [Gaskell Ch. 3]
      i. Entropy as a State Function
      ii. Adiabatic, Reversible and Steady State Systems
      iii. Entropy Changes in Chemical Reactions and the Third Law
   c. Equilibrium – Ragone Ch. 4 [Gaskell Ch. 7]
      i. Phase Equilibria
      ii. First and Second Order Transitions
   d. Chemical Equilibrium – Ragone Ch. 5 [Gaskell Ch. 11 & 12]
      i. Thermodynamic Activity
      ii. Gaseous and Solid-Vapour Equilibria
      iii. Ellingham Diagrams
   e. Solutions – Ragone Ch. 7 [Gaskell Ch. 9]
      i. Partial Molar Quantities
ii.  Ideal and Non-ideal Solutions
iii. Raoult’s and Henry’s Laws
iv.  Regular Solutions
f.  Gibbs’ Phase Rule – Ragone Ch. 8 [Gaskell Ch. 13.4]
g.  Phase Diagrams – Ragone Ch. 9 [Gaskell Ch. 12]
   i.  The Lever Rule
   ii. Miscibility and Immiscibility
   iii. Binary phase diagrams – Callister Ch. 9
       1. Types (isomorphous, eutectic/eutectoid, peritectic/ peritectoid)
       2. Congruent transformations
       3. Phases and compositions

3. Kinetics
   a. Mass transfer – Callister, Ch. 5
      i.  Mechanisms of atomic diffusion (vacancy, substitutional, interstitial)
      ii. Steady-state diffusion, Fick’s 1st Law
      iii. Transient diffusion, Fick’s 2nd Law
      iv. Characteristic diffusion length
      v.  Applications to carburization
      vi. Impurity diffusion – vacancy, substitutional and interstitial
   b. Microstructure development – Callister, Ch. 9
      i. Effect of cooling rate on microstructure
      ii. Fe-C phase diagram
         1. phases
         2. microstructure
   c. Phase transformations – Callister Ch. 10
      i. Concept of chemical equilibrium, application to phase formation
      ii. Thermodynamics of phase nucleation
      iii. homogeneous vs. heterogeneous nucleation
      iv. Transformation kinetics, Avrami equation
      v.  Fe-C system
         1. Kinetics of pearlite formation
         2. TTT diagrams
         3. Metastable phases – bainite, martensite
         4. Effect of alloying – hardness vs. hardenability
      vi. Tempering
      vii. Precipitation processes
          1. Precipitate growth by diffusion
          2. Age hardening

4. Properties of Materials
   a. Mechanical properties – Callister Chs. 6-8
      i. Definition of stress and strain
      ii. Elastic response (Hooke’s law, elastic moduli)
      iii. Tensile stress-strain curve and related parameters for strength and ductility
      iv. Basic dislocation concepts (Burger’s vector, slip systems, deformation due to slip)
      v. Strengthening mechanisms (grain size, solute, work hardening, etc.)
      vi. Recovery and recrystallization
      vii. Ductile vs. brittle fracture
      viii. Fracture toughness, Griffith relationship
      ix. Ductile – brittle transition in steels
      x. Basic concepts in creep and fatigue
   b. Electrical properties – Callister Ch. 18
i. Ohm’s law
ii. Band structure of metals, insulators and semi-conductors
iii. Conduction in terms of band structure and bonding models
iv. Electron mobility
v. Electrical resistivity of metals
vi. Semiconductivity
   1. Intrinsic
   2. Extrinsic: n-type and p-type
   3. Temperature dependence of conduction in semiconductors
vii. Capacitance
   1. polarization
   2. dielectric materials
c. Thermal properties – Callister Ch. 19
   i. Heat capacity
      1. Specific heat at constant volume & pressure
      2. Atomic and electronic mechanisms of heat capacity
   ii. The basis of thermal expansion
   iii. Thermal conductivity
      1. Fourier’s law
      2. applications to steady-state heat transfer
   iv. General ranking of different materials in terms of specific heat, thermal expansion and thermal conductivity
d. Chemical properties – Ragone Ch. 6 [Gaskell Ch. 14]
   i. Electrochemical Cells
   ii. Half Cell Reactions
   iii. Nernst Equation
   iv. Pourbaix Diagrams
   v. Concentration Cells

Part II Comprehensive Examination

The Part II comprehensive exam is centered about the research area of the student. The breadth of the exam will include the fields that are required by the student in order to understand all the features of the student’s research and its possible applications. The topics on which the examination is to be based are set by the supervisory committee and approved by the Chair. The student will be informed of these topics at least 1 month prior to sitting this exam. The examination is an in-depth oral examination lasting two to three hours. The examining committee, to be appointed by the Chair, consists of the Supervisory Committee Members, and two additional faculty members. For full-time students, it will normally take place between 24 and 36 months after the student has registered in the PhD program. Students may be granted a second attempt, but the second attempt must be in this same period. Part-time students should take the exam once their research direction is well established, but in any case it should be taken at least one year before the students expects to submit the PhD thesis.

You must receive 5 positive votes to pass. If there are three or more negative votes on either of the three topics covered, the student will be deemed to have failed that portion of the exam and a reconvened oral exam must be held at a later date. The student should be told of the specific sub-topics requiring improvement as clearly as possible by the Chair of the examining committee. The reconvened exam is the student’s final opportunity to pass this comprehensive exam. Membership on the reconvened examining committee should be the same as that for the original exam. If exam is failed a second time, that decision is final, and is not open to appeal.

Retroactive Admission to the PhD Program

Students who hold a Master’s degree from abroad, but who were nevertheless admitted at the Master’s level may apply for retroactive admission to the PhD program. This should be done within nine 9 months of arriving at McMaster. The student must prepare a short report which is submitted to the Associate Chair – Graduate. The aim of the report is to
demonstrate that the student has a clear understanding of the background of the research project, and of the underlying basis for the work proposed. Thus, the report should include a survey of current literature relevant to the project, and a project outline. If the student has obtained preliminary results, these may be included. However, this is not a necessary component of the report. An oral examination will then be scheduled at which time the student will be expected to answer questions related to the content of the report, and to relevant background material. Following the exam, the committee will recommend either that the student be transferred directly to PhD status, or continue as a Masters’ student. In the latter case, it may still be possible for students to transfer to the PhD program at a later date, as outlined above. The report should not be lengthy (30 typed pages at most).

Research Proposal Exam for Students Enrolling Directly in a Ph.D. Program

Students who enroll directly into the PhD program must submit a written proposal for their research program after one year. The student submits five typed copies of a research report, which should take the form of a literature review plus some preliminary results and analysis followed by a detailed research proposal. The report need not, and indeed should not, be a lengthy document. It should indicate that the student has a good grasp of the background to the project being undertaken, has demonstrated a potential to perform research, and has thought carefully about the research being proposed. The report is examined by a committee consisting of the supervisory committee, augmented by two other MSE faculty members. The student must satisfy the committee that they are capable of successfully completing PhD caliber research in order to be allowed to continue in the program.

After a short oral presentation, the student is asked to defend the Research Proposal. After a discussion of the examination, the Chair will ask for a vote on the success or failure of the exam. If the examiners approve the proposal, the Chair will ask the examiners to complete the Examination Report by initialing appropriately. The student will be invited back to the examination room for congratulations by the committee. The Chair will complete and sign the Examination Report and return it to the Graduate Administrative Assistant.

However, if there are three or more negative votes, the student will be deemed to have failed the proposal exam and a reconvened oral exam must be held at a later date. The student should be told as clearly as possible by the Chair of the examining committee what he/she must do to improve the defence of the proposal. The reconvened defence is the student’s final opportunity to complete the proposal. Membership on the reconvened examining committee should be the same as that for the original exam. If the exam fails a second time, that decision is final, and is not open to appeal.

So what is required of a potentially good PhD student? Obviously knowledge as such has some importance but it is not of prime importance. In asking students to write a research proposal, we essentially are asking them to ask themselves questions such as:

- Why am i doing this research, i.e. what is the essence of the problem? How does my proposal relate to previous work?
- What form of measurement will I use or what theoretical basis will I assume?
- Do I really understand this form of measurement, i.e. the basic science behind it, the accuracy and sensitivity required, etc?
- What alternative measurements or techniques could I use and why have I rejected them in favour of the one proposed?
- Can the problem be modeled, and on what basis?

In short, does the student have the interest and capability of a scientist or engineer who can analyze a problem with complete understanding, or is the student prepared only to look at it superficially, with uncritical adoption of other people’s opinions? Of course, the answers to everything cannot be known or there would be no point in doing the research, but the questioning by the student of what is important, should have been done. A PhD degree demands maturity on the part of the student and the student should be able to take over the problem from his supervisor. It is, after all, an indication of the ability to do independent research.
PhD Defence

This is also an oral exam administered by the School of Graduate Studies. The examining committee includes members of the supervisory committee, members of the University from outside the department, and an external examiner from outside the University. After a short oral presentation, the student will be asked to defend the contents and background to the written thesis. This is a PUBLIC examination open to all interested persons.

COURSE WORK REQUIREMENTS SUMMARY

Master’s Degree

- **12 units** of course work: **9 units** of course work in addition to the mandatory MATLS 701 course (**3 units**)
- 700 level courses are either a half course (**3 units**) or quarter course (**1.5 units**)
- 600 level courses are offered as half courses (**3 units**) – only 1 permitted
- 50% of courses must listed or cross-listed in the Department (Materials Science and Engineering)
- Select course work after consultation and permission of your Supervisor

Accelerated Master’s Degree Option

- 1 term (4 months) research project with Supervisor; in summer of 3rd or 4th year
- 1 600 level course (**3 units**) in final year of undergraduate degree (counts towards undergraduate AND graduate degree)
- Complete MATLS 4K06 OR a second 4 month summer work term
- 50% of courses must listed or cross-listed in the Department (Materials Science and Engineering)
- Enroll in MASc. program
- **6 units** of course work (700 level) in addition to the mandatory MATLS 701 course (**3 units**)

PhD Degree

- **12 units** of course work: **9 units** of course work in addition to mandatory MATLS 702 course (**3 units**)
- 700 level courses are either a half (**3 units**) or quarter course (**1.5 units**)
- 600 level courses are offered as half courses (**3 units**) – only 1 permitted
- 50% of courses must listed or cross-listed in the Department (Materials Science and Engineering)
- Select course work after consultation and permission of your Supervisor

DEGREE PROGRAM REQUIREMENTS SUMMARY

Master’s Degree

TA Training Sessions (first time TA students only) – September 2019 and January 2020
- Mandatory - Students are paid for TA training once

SGS 101 / SGS 201
- Complete by the end of the term that you started your program. A pass is required. If you did not receive a pass the first time, you can re-take the exam and email your passing grade to sgsrec@mcmaster.ca
- NOTE: these courses are administered by the School of Graduate Studies

MATLS 701 Seminar Course
- Mandatory attendance for all students
- Must complete 1 seminar course (usually in 2nd year)

Career Planning Milestone Training & Report (CARP)
- Attend training session in September 2019 for May 2019 and September 2019 starts
- Submit report to the Grad Admin by end of Year 1 (3 Terms: 12 months)
Supervisory Committee Meeting and Report
- Complete by end of Year 1 (3 Terms: 12 months)

Transfer Exam Option
- Transferring to the PhD program prior to completing a Master’s degree
- Transfer report submitted by end of Term 5 (20 months)

Defence
- Complete by end of Year 2 (6 Terms: 24 months)
- Exam administered by Department
- Exam Committee: Supervisory Committee plus 1 external member

PhD Degree

TA Training Sessions (first time TA only) – September 2019 and January 2020
- Mandatory - Students are paid for TA training once

SGS 101 / SGS 201 – mandatory
- Complete by the end of the term that you started your program. A pass is required. If you did not receive a pass the first time, you can re-take the exam and email your passing grade to sgsrec@mcmaster.ca
- NOTE: these courses are administered by School of Graduate Studies

MATLS 702 Seminar Course
- Mandatory attendance for all students
- Must complete 2 presentations (usually 2nd year, final year)

Career Planning Milestone Training & Report, CARP
- Attend training session in September 2019 for May 2019 and September 2019 starts.
- Submit report to the Grad Admin by end of Year 1 (3 Terms: 12 months)

Part I Comprehensive Exam
- Approximately 8 months from admission entry
- Selected Exam Committee administered by Department

Supervisory Committee Meeting and Report – Annual Requirement
- Complete yearly - due each year by November 30 (exception: September incoming students)
- Complete using online Supervisory Committee Reporting form

Research Proposal Exam
- Submit written research proposal by end of Year 1 (3 Terms: 12 Months)
- Exam Committee: Supervisory Committee plus 2 external members

Part II Comprehensive Exam
- Complete before the end of Year 3 (9 Terms: 36 Months)
- Exam Committee: Supervisory Committee Members, 1 external member chosen by Associate Chair - Graduate

Defence
- Completed by end of Year 4 (12 Terms: 48 months)
- Exam administered by School of Graduate Studies
2019-20 Graduate Handbook Sign-off Sheet

I have read the MSE Graduate Handbook and reviewed the document with my supervisor. I understand that in the event of a discrepancy between the information provided in this handbook and the School of Graduate Studies Calendar, the latter prevails.

☐ I have read the 2019-20 Graduate Handbook in its entirety.

☐ I have met with my Supervisor prior to the start of term.

____________________________________  ______________________
Student Name  Date

____________________________________  ______________________
Supervisor  Date

Please return signed and completed form to the Graduate Administrative Assistant, JHE 357.