

2024-2025

Department Handbook



COLLEGE OF ENGINEERING

MATERIALS SCIENCE & ENGINEERING

UNIVERSITY OF MICHIGAN

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Dear Materials Science and Engineering Graduate Students,

We are happy that you have chosen to come to Michigan for your graduate degree. Our graduate programs are proud to train the 21st century materials scientists and engineers who will champion innovative solutions to the global problems in manufacturing, energy, national security, transportation, health care, electronics, communications and consumer products.

Our graduate research portfolio is equally strong and balanced between functional and structural materials, and between experimental and computational materials research. You, the students, are the life of the graduate program and we look forward to working with you as we strive to research the most challenging materials engineering problems that benefit the society.

This handbook will be a useful resource for you as you navigate through the department for the next few years working to complete your degree. We are here to provide you the guidance and resources you need for a productive and fun graduate student experience. Please feel free to reach out to us anytime with questions or feedback about the graduate program.

Welcome to the Department of Materials Science & Engineering at the University of Michigan!



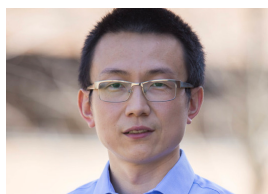
Professor Elizabeth Holm

Richard F. and Eleanor A. Towner Professor of Engineering
MSE Department Chair



Associate Professor Geeta Mehta

PhD Chair



Associate Professor Liang Qi

Master's Chair



Renee Hilgendorf

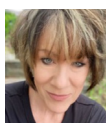
Graduate Program Advisor

Departmental Information





Meghan Connolly remote. Meghan supports the research administrative needs for Tim Chambers, Robert Hovden, Jinsang Kim, Yiyang Li, Claudia Loebel, Emmanuelle Marquis, and Wenhao Sun.



Shelley Fellers, MSE Reception, 3074 Dow. Shelley is responsible for conference room reservations, copiers in 3074 Dow, sorting mail and maintaining mailboxes, UPS shipping and deliveries, Marketsite ordering, and undergraduate reimbursements. She also helps coordinate the MSE Colloquium, and processes guest reimbursements.



Lisa Fields, remote. Lisa supports the research administrative needs for John Kieffer, Jinsang Kim, Manos Kioupakis, Richard Laine, Brian Love, Emmanuelle Marquis, Liang Qi, Kathleen Sevens, and Ashwin Shahani.



Cassandra Franklin-Smith, HR Generalist, remote. Cassandra supports both MSE and ChE as an HR Assistant with a split appointment. She assists both departments with processing temporary employee activity, payroll and international visitor documentation.



Kristen Freshley, Marketing/Communications Specialist, 3062C Dow. Kristen creates all marketing materials, including the digital and printed newsletters. She also organizes major department events. She is available to take professional headshots for all interested students.



Renee Hilgendorf, Graduate Program Advisor. Renee can be found in 3062D. She handles all aspects of the Graduate Program (academic, GSI appointments and graduate fellowships, benefits, and recruiting/admissions.) Renee works with the Ph.D. and Master's Committees.



Lourdes Jorgensen, Financial Specialist Intermediate, 2142 Dow. She processes all orders for MSE, processes reimbursements for guests, processes PCards for faculty and provides administrative support to the department.



Kathy Kuhn, Finance & Research Manager, remote. Kathy supports the administrative research needs for John Allison, John Heron, Geeta Mehta, Amit Misra, Ferdinand Poudeu, Max Shtein, Kai Sun, Anish Tuteja, George Wynarksy, and Steve Yalisove.



Tina Longenbarger, Executive Secretary, 3062 Dow. She works for the department chair. Please contact her if you would like to make an appointment with Professor Holm.



Maya Mulchandani, Administrative Assistant, 3062 Dow. Maya helps organize and support our many department events, conferences and workshops. She also helps support the Macro academic program.



Huimin Ponchart, Business Manager, 3074C Dow. Huimin is responsible for providing expert management and coordination of all aspects of research administration. She supports the research administrative needs for Rachel Goldman, John Halloran, Robert Hovden, Wayne Jones, Alan Taub, and Katsuyo Thornton.



Todd Richardson, Department Administrator, 3062E. He approves all HR, payroll and financial transactions including expense reimbursements and travel advances. He can also assist with problems in dealing with other offices throughout the university as well as general policies and procedures.



Patti Vogel, Undergraduate Program Advisor, 2146 Dow. She handles all aspects of the Undergraduate Program and works with the Undergraduate Committee on program and Van Vlack Lab issues.



Wanlei Zhu, Financial Specialist, remote. Wanlei provides support for the post-award and financial analysis functions within the department. She assists with transactional processing and implementation of financial controls.

TECHNICAL SUPPORT STAFF

Below is a listing of key personnel on our technical staff, their primary job duties, and how their job may relate to you:



Keith McIntyre, Senior Facilities Engineer. Keith can be found in Room 2231A Dow, and handles department facilities-related issues. He is responsible for the technical staff, and the care and maintenance of department equipment in the metallography, thermal processing, and mechanical testing laboratories; he can offer instruction in the use and care of those items. Keith can also help you in the design and set up of equipment in your research lab.



Chris Cristian, Associate Desktop Support Specialist, 2224C Dow. Chris assists in all the computing needs for faculty and staff of the Materials Science & Engineering department, particularly in the Windows and Apple operating systems. Chris also assists in any computing needs for the Van Vlack Laboratory and is available to answer any computer related question or problem. Chris also administers the departmental backup server and helps keep departmental machines updated. You can e-mail Chris at chriscwsc@umich.edu.



Jack Eilers, Engineering Technician, jeilers@umich.edu, 2224C Dow. Jack is responsible for repair, maintenance and training users, including undergraduate and graduate students, on proper use of laboratory equipment.



Sahar Farjami, Engineering Technician, farjami@umich.edu, 2224B Dow. Sahar is responsible for repair, maintenance and training users, including undergraduate and graduate students, on proper use of laboratory equipment. Sahar participates in continuous process improvement efforts in the Van Vlack labs and assists other team members and students as needed.



Ying Qi, Senior Research Project Engineer. Ying is in charge of maintenance, service and repair of testing instruments and research equipment including electronics, vacuum systems, computer-based systems, mechanical testing equipment, etc. She can help you with your electrical circuitry and electronics problems. She can also assist you in designing test instruments to meet your specific research needs. Ying is located in 2219A Dow; however, she spends a lot of her time overseeing the safety and operation of X-Ray MicroAnalysis Laboratory (XMAL). She also spends part of her time in (MC)², which is located in Building 22 of NCRC. Ying is responsible for the operation of the SEM and X-ray diffraction facilities 2219A Dow building. Anyone wishing to use these facilities must be trained and approved by her before being allowed to use the equipment.



Kai Sun, Associate Research Scientist (also in (MC)²). Kai specializes in materials structure characterization up to sub-Angstrom level. He can help you with problems in transmission electron microscopy, scanning transmission electron microscopy, scanning electron microscopy, X-ray photoelectron spectroscopy, scanned probe microscopy and focused ion beam techniques. Besides performing his own research, he is also responsible for training users to use the equipment in (MC)². If you need to use the facilities of (MC)², you should contact Kai or his colleagues (mc2.engin.umich.edu). Kai can be contacted by phone on 936-3353 or by email (kaisun@umich.edu).



Kevin Worth, Senior Information Technology Administrator. Kevin is located in Room 2224A Dow. Kevin takes care of the network in the MSE department, and maintains all department-owned computers and servers. He runs the MSE web server and file server. He can also recommend software for research use. Contact Kevin at 6-0173 or by email at kworth@umich.edu.

Day-to-Day Operations



YOUR SPACE

Once you have received support as an GSRA or GSI, you may be assigned an office area. This area will have a desk, and a single file cabinet for your use. You or your advisor may request desk space, however the Chairman's staff will ultimately make the assignments. You can check with the Facilities Engineer, Rm. 2231A, for help in getting office space. Once you have your desk, we will supply you with a name tag which you should affix to the front of the desk so that your area can be easily located.

You will undoubtedly want to keep a variety of articles in your space which are of importance to you while you are doing your research such as tools, instruction manuals, materials and so forth. It is important to note that when you are preparing to graduate, it is your responsibility to turn all of these items over to the next person on your project, your advisor, or your office mate. Please do not just leave them in your favorite hiding place or worse, sweep it all into the waste can. Please keep the office doors LOCKED.

MAIL

All full-time graduate students will have a mailbox in 3074B Dow. Since space is limited, so please do not have personal mail sent to this address. Check it regularly since this is the best way to contact you. If a shortage of student mailboxes should occur, only those students funded by the dept. will be provided with a mailbox.

When corresponding with individuals or companies requesting catalogs or placing orders for equipment with a purchase order, be sure that you give (as part of your address) your name, the name of this department, your room # and the building. By using the correct address, it makes it much easier for the post office to direct your mail to the correct department mail bag and speeds the delivery of your mail.

FOR SHIPPING:

(your name)

Dept. of Materials Science and Engineering
(your room number) H. H. Dow Building
The University of Michigan
G.G. Brown Dock, Beal Street
Ann Arbor, MI 48109-2125

All shipments are now accepted at
the G. G. Brown dock and de-
livered to the mailroom in 3074B
Dow. Arrangements must be made
with dock staff for delivery of larger items.

IMPORTANT: When companies request an address for billing, give them the following (they will be paid for services much more quickly):

FOR INVOICING:

U-M SSC Accounts Payable
3003 S. State Street
Ann Arbor, MI 48109-1287

Please be sure to include the
10-digit Purchase Order No.

KEYS

It will be necessary to carry a number of keys to get into your personal, research, and teaching rooms. If you are only doing course work, you will not be issued extra keys. To request a key, ask the Facilities Engineer for a Key Request Card who will then issue the key requisition that is taken to the Key Office. You will be required to pay a small refundable deposit for each key. Please return your desk key to the facilities engineer and clean out your desk before leaving.

COPY/FAX/PRINT

- Copy Machine - The copier in 3074B Dow requires a code assigned to your research group. Please report problems to Shelley in 3074 Dow. May be accessed 8:00–5:00 M-F.
- Fax Machine – Room 2146C may be accessed from 8:30 – 5:00 M-F.
The fax number is (734) 743-4788. This machine requires an access code.
- Laser printer in Room 2076 Dow may be used for class or research purposes.

Students are responsible for providing their own office supplies.

DEPARTMENT ORGANIZATIONS

The department supports a number of student organizations and activities. The organizations are largely run under the auspices of the umbrella organization called the **Michigan Materials Society (MMS)**.

Groups covered by MMS

ASM International	TMS-AIME
American Ceramics Society (ACS)	Society of Plastics Engineers
American Vacuum Society (AVS)	Materials Research Society (MRS)
American Physical Society (APS)	

In addition, the department supports **Alpha Sigma Mu**, a materials honor fraternity. MMS and Alpha Sigma Mu provide activities for students on campus including sports activities, seminars, and plant trips. MMS sponsors annual picnics held each fall and spring, generally at Prof. Hosford's home. In addition, students are encouraged to attend regularly scheduled local or national meetings of ASM, TMS, ACS, etc. Student membership in one or more professional societies automatically provides membership in MMS. The faculty strongly advocate participation in MMS activities.

The **MSE Graduate Student Council** was formed to promote closer relationships - intellectual, social, and professional - between the MSE graduate students and to help provide opportunities for such interactions, as well as represent the interests and concerns of the grad students to the faculty. It organizes various events such as coffee hours to discuss various aspects of research and other intellectual and social events.

The emails for MSE GSC and the individual officers are as follows:

MSE GSC group email (all officers): mse.gsc@umich.edu
 1st year representative: mse.gsc.first@umich.edu
 2nd year representative: mse.gsc.second@umich.edu
 3rd year representative: mse.gsc.third@umich.edu
 4th year representative: mse.gsc.fourth@umich.edu
 5+ year representative: mse.gsc.fifth@umich.edu
 Secretary/treasurer: mse.gsc.scty@umich.edu
 President: mse.gsc.pres@umich.edu

COLLOQUIA (FRIDAY SEMINARS)

During the academic year, the MSE department sponsors a weekly colloquium, or seminar series. This year the seminars will be held on Fridays from 10:30 – 11:30 in 1670 Beyster. These colloquia feature invited scientists and engineers from both inside and outside the university. Attendance by graduate students who are supported by department fellowships or as RAs/GSIs is mandatory and 4 semesters - One (1) credit of 890 registration is required. Attendance by self-supported graduate students is encouraged.

Also during the academic year, MMS sponsors weekly luncheons on Fridays following the seminar. The group invites guests, often MSE alums, from a wide variety of materials backgrounds to give 30-minute presentations. Lunch is typically provided.

Other departments in the university also sponsor seminars, and students are welcome to attend any of interest. In addition, the MSE department occasionally sponsors special seminars for faculty candidates, visiting scientists, etc. Announcements for both regular and special seminars are posted around the department.

GENERAL DEPARTMENTAL INFORMATION

ORDERING MATERIALS & EQUIPMENT

To place an order, go to MSE's Online Purchasing System" (OPS) system. Use OPS to obtain approval, and when necessary, purchase order (PO) number, before placing an order. Only 1 (one) supplier per OPS order. All who have a U-M unigname and kerberos password can use OPS.

See MSE How-To's for procedures on how to place orders: <https://mse.engin.umich.edu/internal/howto>.

Here are helpful training videos and resources:

- OPS: <https://deptapps.engin.umich.edu/ops/purchaser/orders?dept=221800>
- Create/modify your OPS Profile: <https://me-web2.engin.umich.edu/order/index/profile?dept=221800>
- Order = < \$50k: <http://procurement.umich.edu/buying/find-products-services>
- Order > \$50k: <https://procurement.umich.edu/u-m-employees/purchasing/sourcing/>
- CoE Purchasing and T&E Toolbox: <https://sites.google.com/umich.edu/opstoolbox/home-page>
- Marketsite Training Video: <https://procurement.umich.edu/u-m-employees/purchasing/ordering/mmarketsite/>

For assistance with sourcing or any procurement questions, contact Lourdes Jorgensen (jorgenl@umich.edu, 734-763-6043, H.H. Dow Bldg., Room 2142)

Procurement Services contact information:

Phone: (734) 764-8212, prompt 2 (8:00 a.m. to 5:00 p.m.)

Fax: (734) 615-6235

Email: procurement.services@umich.edu

RECEIVING MATERIALS & EQUIPMENT

Small packages

Small packages are delivered daily to the G.G. Brown (GGB) dock for distribution. The packages are then delivered to 3074 Dow and logged in by the main desk receptionist. Please check the log sheet at the desk to see if your package has arrived. The receptionist will assist in getting your package and ask you to log the package out before leaving. Package pickup is from 2–5:00 daily after all deliveries have been received for the day. Chemicals will be delivered to the GGB dock for pick up by you. Please include your faculty group name when ordering packages.

Large items

Very large items should also be delivered to the GGB Dock. They will arrive by truck, and you should give the vendor the address of the GGB dock to make sure it ends up there. The address is:

Materials Science and Engineering Dept.
The University of Michigan
G. G. Brown Dock
1379 Beal Avenue
Ann Arbor, MI 48109-2125

Packages Received via U.S. Mail

Packages that are shipped by regular mail will also be in the package room, 3074 Dow.

Receiving Compressed Gases

Cylinders of compressed gases are delivered to the rack located on the dock of GGB on Beal Avenue on the East side of the building. You must pick up the cylinders and deliver them to your laboratory. There is a monthly fee of \$2.65/cylinder, so return cylinders when they are empty. Cylinders can be returned to the G.G. Brown dock where they will be taken away. Remember to indicate that they are empty. Also remember to transport full cylinders in a safe manner, as they pose a significant safety hazard. (See Safety-Section 3.0 of this handbook for the safe procedures on transporting gas cylinders.) The dock area is not to be used as a storage area. Any cylinders there for more than one week may be returned, full or empty.

CASH ADVANCES

Cash Advance services are administered by the Shared Services Center (SSC). The advance must be properly reconciled within 45 days after return from the trip. Whenever possible, employee expenses should be paid for on a university PCard or Travel Card. Cash advances should be limited to employees with a compelling financial need. Employees may request an advance within a reasonable period of time before an authorized business trip, typically 2-4 weeks before the trip, to allow time for processing. Employees must submit requests for cash advances (if the appointing unit allows) through Chrome River.

A cash advance cannot be used to pay for airfare. Airfare should be booked with the university's travel partner, Collegiate Travel Planners, and will be automatically charged to the CTA payment card.

A cash advance also cannot be used to pay for an employee's per diem in advance unless the trip qualifies for one of the exceptions below.

After you submit the request, send a detailed email to Todd Richardson (dtrichar) with the information to support the amount you are requesting so he is aware of the request. When approved the advance will be deposited into your bank account.

BUSINESS MEALS (HOSTING)

Business meals are those taken with guests of the University during which focused business discussions take place.

Business meal expenses, including non-alcoholic beverages and tips, should not exceed the maximum per person allowances of \$30/breakfast, \$30/lunch, and \$70/dinner. Alcoholic beverages are limited to \$20 per person, per event, served at dinner only. Alcohol is not permitted for recruiting activities. Alcohol must be charged to non-General, discretionary funds or may be claimed as a personal expense

Expense Reporting: <https://procurement.umich.edu/u-m-employees/travel-expense-reporting/expense-reporting/>

MAILING & SHIPPING

You can send mail postage-free within the university by enclosing your document in a University mail envelope, addressing it, and dropping it in the appropriate box in MSE/ChE mailroom, 3074B Dow. Make sure you include the university zip code in the address.

You can mail work-related letters or documents via the U.S. Mail by using a university departmental shortcode. Complete your name and return address on the envelope, and write the university departmental shortcode in small letters where the stamp is usually placed. Bring the letter to Shelley Fellers in 3074 Dow.

You can also send work-related packages or letters using UPS. Packages can be sent via UPS from the MSE department office. Complete a shipping form located outside 2142 Dow and submit with your package to Shelley Fellers in 3074 Dow or Debbie Johnson in 2142 Dow.

REIMBURSEMENT FOR HOSTING AND TRAVEL EXPENSES

To submit a request for reimbursement, go to MSE Travel and Expense portal (<https://deptapps.engin.umich.edu>). University representatives may be reimbursed for approved, necessary and reasonable local business meal expenditures. A clear and specific business purpose must be provided (e.g., "to foster collaboration between departments" is not permitted). Out-of-pocket expenses submitted more than 45 days after the transaction date—or end of the trip for travel expenses—will be treated as taxable income and need to be processed through Payroll. See MSE How-To's for procedures on how to submit a request for reimbursement: <https://mse.engin.umich.edu/internal/howto>.

Here are helpful training videos and resources:

- MSE Travel and Expense portal: <https://deptapps.engin.umich.edu/te/index/myrequests?dept=221800>
- CoE Training Presentation on Travel & Expense (T&E) Portal: https://drive.google.com/file/d/1IA3JO4QU_oi1xNdN8Dv55_gVmhavayfN/view
- CoE T&E and Purchasing Toolbox: <https://sites.google.com/umich.edu/opstoolbox/home-page>
- CoE Hosting and Travel Policies: <https://rpm.engin.umich.edu/college-of-engineering-hosting-and-travel-policies/>
- Procurement Chrome River Training Presentation: https://www.mivideo.it.umich.edu/media/t/1_tmfxssq
- Procurement - Travel & Expense Reporting: <https://procurement.umich.edu/u-m-employees/travel-expense-reporting/>

For assistance, contact **Lourdes Jorgensen** (jorgengl@umich.edu, 734-763-6043, H.H. Dow Bldg., Room 2142)

GENERAL DEPARTMENTAL INFORMATION

PICK-UP TRUCK

A U-M truck can be obtained through the Transportation Department.

WORKING IN THE MSE MACHINE SHOP

The MSE department has a band saw, a lathe / drill / mill, bench grinder, bench sander and abrasive cut off wheel which are available for students to use. They are located in room 2231, and are accessible to students Monday through Friday from 8:30 a.m. 5:00 p.m. The use of these machine tools after hours is prohibited. Before using any of these tools, you **MUST** be trained and given authorization to do so through the department FOM System. Violators of these safety rules will be denied access to the equipment.

You are strongly encouraged to use the Chemistry Department Instrument Shop on central campus or Lay Automotive Machine shop for more advanced machining services. They are a full-service instrument shop. A student shop is also there which is well maintained and equipped (it has a milling machine and a lathe). MSE students can use the Chemistry Department Student Shop if (and only if) they complete a short training class offered periodically by the Chemistry Shop staff. Contact the shop supervisor at 764-7363 for more information.

It is a good idea to think through your project before taking it to an instrument shop. You should prepare a sketch (or better yet, an engineering drawing) of your project, complete with dimensions and tolerances. If the project is more complex than one or two parts, an Isometric drawing of the finished item will help the toolmaker visualize the whole concept. Use common sense when selecting tolerances or finishes. Typical close tolerance is + 0.005 inches (0.05 mm). The closer the tolerance required, the greater the cost, and the longer the delivery time. Closer tolerances may require the use of special machinery, which may not be available in the Chemistry department shop.

It will speed your work if you convert metric dimensions into English dimensions. Most of the equipment in the shop is set up in the English system.

If you are not good at sketching you may want to consider learning to use one of the drawing or CAD programs supported by CAEN. Investing a little time in making a good drawing will save time, money, and headaches in the long run.

REMEMBER: MEASURE TWICE—CUT ONCE!

USING THE SERVICES OF THE UNIVERSITY PLANT DEPARTMENT

The plant department includes the electric shop, the sheet metal shop, the carpenter shop, the air conditioning unit, the moving and shipping group, and several other units—all are listed in the university phone book. The plant department will provide service to you through the use of a work request form. This form must be filled out with your project number, contract number, name, and an adequate description of the work you need done. All work requests must be submitted through Keith McIntyre (khm@umich.edu) or Todd Richards (dtrichar@umich.edu).

Your project will be sent to the appropriate service group for completion. If the job is simple the appropriate trades person will deal it with directly. If the job is large and complicated, your project manager should initiate it for it will probably involve plant engineering, and should be part of your contract.

Be aware that a simple plumbing or electrical request can be very expensive to your contract or grant. Requests for quotations are always referred to the plant engineering department, and your account will be charged a fee for the quote whether you do the work or not. Plan as carefully as possible to avoid laboratory modifications. Always check with your advisor and the Facilities Engineer (Rm. 2231A Dow) regarding such modifications. You may not do even simple modifications/renovations to facilities on your own.

Lab Safety & Research Facilities



LABORATORY SAFETY

As a researcher in the MSE department, you are responsible for developing and implementing good safety practices in the laboratory. These good practices are extremely important because the labs in our department contain a variety of dangerous chemicals and machinery. Unfortunately, one careless move can result in significant injury or damage. You are therefore strongly encouraged to carefully read the rules and procedures shown below. You must attend the OSEH lab safety class before you will be issued keys to your lab.

GENERAL SAFETY RULES

1. Always wear eye protection when working in laboratories. You may wear goggles or safety glasses with side shields as appropriate.
2. Do not wear contact lenses in the laboratory, even under safety glasses. They will compound eye damage in the event of an injury.
3. Remove rings, watches, bracelets, necklaces and large earrings when working with tools, machines, or dangerous chemicals.
4. Wear clothing that will provide maximum protection from chemical splashes or flying debris. Shorts and sandals are prohibited in the Van Vlack laboratory.
5. Wear close-fitting clothing made of relatively smooth, close woven fabrics. Neckties, sweaters, and bulky shirts or blouses should not be worn. Long sleeves on shirts or blouses should be rolled snugly above the elbows.
6. Wear closed-toe shoes to protect your foot from splashes. Sandals, open-toed shoes, and high-heeled shoes are prohibited.
7. Long, loose hair styles must be safely contained in a scarf, cap, or other appropriate fashion.
8. NO horseplay in the laboratory.
9. When handling dangerous chemicals or dangerous materials, wear protective gloves, a rubber apron, and an eye splash shield. Rain suits are available. If possible, use shielding or work in the hoods with the door closed as far as possible. Anytime chemicals must be moved outside of the lab, they must be in a secondary container to prevent spills if the primary container should break.
10. All chemicals from Fisher or Aldrich must be ordered through Shelley Fellers and include an MSDS sheet. All other chemical orders can be ordered through Debbie Johnson.
11. Post a safety SOP for all experiments that you set up.
12. When working with machines like the band saw, drill press, or rolling mill, have a second person present.
13. Report any injury, no matter how small, to a member of the MSE staff.
14. When lifting heavy objects, lift with your legs as opposed to your back to prevent injury.
15. Be aware of the many high voltage sources in the department. Exercise extreme caution when doing work on the electronics of a machine, and always turn off the power first. However, remember that capacitors can store charge for quite some time even after the power has been turned off. If you aren't sure what you are doing, please find help.

FINDING NECESSARY SAFETY INFORMATION

Each laboratory has a Chemical Hygiene Plan (CHP) either on or near the door. The CHP contains a variety of information, including SOP's (Standard Operation Procedure) for all equipment and activities that occur in the laboratory.

Each research group has a safety officer who is in charge of implementing and enforcing safety regulations in those laboratories belonging to his or her advisor. Safety officers meet regularly to learn about new safety procedures being implemented by the university. You should go to your safety officer if you see a safety problem in your lab, or are unsure of how to conduct an experiment safely.

FINDING NECESSARY SAFETY INFORMATION (CONT'D)

If you plan to use chemicals or materials that are unfamiliar to you, it is wise to check out the hazards, if any, associated with their use. Occupational Safety and Environmental Health (OEH) has files containing Materials Safety Data Sheets (MSDS) on most chemicals you would use. MSDSs for all chemicals in the MSE department are located on-line at [HTTP://www.mse.engin.umich.edu/internal](http://www.mse.engin.umich.edu/internal). Select "chemical inventory," then login using the following:

user name: safety

password: safety

You may also contact our OEH safety representative @ehs.umich.edu or 734-763-1185

The Engineering Library, located in the Media Union, also contains copies of the Merck Index and Irving Sax' Dangerous Properties of Industrial Materials. The most current editions are kept at the reference desk, while the older editions are available for checkout.

The Merck Index RS356.M555 1996

Dangerous Properties of Industrial Materials, Sax, Irving T55.3 H3 S27 1992

INJURY

If a person is seriously injured or ill on the job (amputation, chest pain, loss of consciousness, severe burn or trauma), call 911 immediately and request an ambulance. He or she will then be transported to the nearest Emergency Room. The person's supervisor must fill out an "Employee Accident or Illness Report" and submit it to the Risk Management office.

If the injury is less severe but still requires medical treatment, the person should be transported to the M-Works facility in Ann Arbor, provided the injury occurs on weekdays between 7 a.m. to 5 p.m. M-Works is run by the University of Michigan, and is specifically set-up to deal with workplace injuries of U/M employees. (All research and teaching assistants are employees of the university.) The injured person should preferably be accompanied by a supervisor and should have an "Employer Referral Form" filled out describing the nature of the injury. If the injury occurs on an evening, weekend, or holiday, the person should be transported to the nearest Emergency Room. As in the case of a major injury, the injured person's supervisor must also fill out an "Employee Accident or Illness Report" and submit it to the Risk Management office.

FLOOD

If there is a flood during the day, notify a member of the MSE staff immediately. If at night, call Public Safety as well as a member of the MSE staff at home.

HAZARDOUS CHEMICAL SPILL

If you spill a hazardous chemical, use your best judgment on how to deal with it. If it is a small spill and there is no immediate danger of inhalation damage, explosion, or fire, you should use a spill kit to clean it up. Notify a member of the MSE staff as soon as possible. If the spill is large and obviously hazardous, pull the fire alarm, call 911, notify MSE staff personnel (if possible), and leave the building. Be sure to remain in the area (Northwest Entrance, Level 3) to give direction to emergency personnel.

FIRE

If a fire starts in your lab, use your best judgment on what to do. If you are confident that you can put it out with a fire extinguisher, do so. (For example, a small alcohol fire in a petry dish can probably be put out easily.) Remember to aim at the base of the fire. Notify a member of the MSE staff as soon as possible. If you have any doubts at all about being able to put the fire out, do not attempt to do so. Instead, pull the fire alarm, call 911, notify MSE staff personnel (if possible), and then leave the building. The alarm will alert people to evacuate the building and will summon the fire department located on North Campus. Fire alarms are located in corridors throughout the department. Be sure to remain in the area to give direction to emergency personnel.

Special note: The fire extinguishers in the department are designed to put out a wide variety of fires, including oil fires, paper fires, etc. They are NOT designed to put out metal fires (such as burning Na or K.) There is one fire extinguisher located in 2231 Dow which is specially designed to put out combustible metal fires.

LABORATORY SAFETY

HAZARDOUS WASTE DISPOSAL

It is important that hazardous waste be disposed of properly. Chemicals cannot simply be dumped down drains, nor can broken glass or razor blades be tossed in the trash. Chemicals must be labeled, packaged up, and then picked-up by OSEH for disposal. The proper procedures for disposal can be found in the University of Michigan's "Hazardous Waste Manual", which is located in most labs with chemicals. Labels and hazardous waste manifests can be obtained from OSEH. See the Facilities Engineer if you need additional assistance.

GENERAL BUILDING PROBLEMS

Plant Maintenance-ext. 7-2059

If a building facility malfunctions (i.e. leaky faucet, no air pressure, water in the air line, no gas, lights burned out, etc.) please let a staff member know so that it can be reported to the plant maintenance department. After hours please call the building maintenance secretary at 747-2059. She will record your problem, take your name and phone number, then give you a sequence number, and a priority code for this service call.

If the nature of your call is an emergency (priority #1), stay close to the problem area so that the person who comes to investigate can easily find you.

Should you have an emergency problem requiring entry to the service corridors after hours (for example - an open circuit breaker or need to open or close a valve) call the security office at 763-1131 and make your request for entry. Be sure to give your location, and the reason for entry. Then stay close to the job!

Building Services-ext. 7-2059

If you notice a problem with water on the floor, other spills, or missing supplies in the restrooms, then Building Services should be called at 7-2059 for their help.

PLEASE NOTIFY THE DEPT. FACILITIES ENGINEER OF ANY BUILDING PROBLEMS!

EQUIPMENT USE

There are many pieces of equipment available to the student for use at their discretion. There are, however, a few general rules that should be followed when using this equipment to avoid destroying it in the process:

1. Learn how to use the equipment by asking for instructions before using it. Requests may be made through FOM. Please read the SOP in the CHP located in the safety files for that lab. The department will insist that you show that you have adequate instruction before using certain pieces of delicate equipment. Secondary training is not permitted.
2. Please make it a practice to keep the equipment clean and the parts in their proper stored location after using. TRASHING THE WORK AREA WILL NOT BE TOLERATED. In the event that students are discovered consistently leaving a mess in the labs, the department will be forced to limit access to the equipment. This would create a hardship for everyone.
3. Equipment, which is for general use, is NOT to be modified for your private use in a semi-permanent manner. If your experiment will create hazardous conditions in the surrounding area, which affects the simultaneous use of other equipment, you must get permission from those that are affected, including Facilities Engineer.
4. If you have borrowed equipment, return it to the source as soon as you are through with it so that it is available for others.
5. If you need cooling water or fluids transferred by tubing on your equipment, please use special care in setting up the system so the tubing is well anchored at each end, and is supported properly. All of the floors have cracks and leak badly. Spills and leaks are inevitable, and must be guarded against. The faculty or staff will shut you down on the spot if you insist on operating carelessly.

There are many pieces of equipment available to the student for use at their discretion. There are, however, a few general rules that should be followed when using this equipment to avoid destroying it in the process. These are as follows:

Do not leave your equipment unattended for more than 6-8 hours. Always come in early in the morning to make a leak check. Always leave an "Experiment Running" sign on the door.

EQUIPMENT USE (CONT'D)

It is important that hazardous waste be disposed of properly. Chemicals cannot simply be dumped down drains, nor can broken glass or razor blades be tossed in the trash. Chemicals must be labeled, packaged up, and then picked-up by OSEH for disposal. The proper procedures for disposal can be found in the University of Michigan's "Hazardous Waste Manual", which is located in most labs with chemicals. Labels and hazardous waste manifests can be obtained from OSEH. See the Facilities Engineer if you need additional assistance.

If a spill does occur, clean it up immediately! A wringer bucket and mop is kept in room 2231 Dow. Please return in when you are finished. Should a leak occur in the plumbing in your room (back-flow preventers or faucets are particularly bad in this respect) attempt to shut the system down immediately if you can gain entrance to the service corridor. If it is after hours, contact the security personnel so that they can do it for you. All valves are numbered and the numbers are listed on your room WATER CONTROL sheet by an exit for quick reference. Report this type of leak to your advisor and to one of the technical staff so that the department is aware of the leak. The people downstairs are very sensitive to leaks and we should do everything we can to accommodate them by prevention and quick clean up.

6. Check the posted schedules and sign up for equipment time when you need it. However, please note that class usage takes priority over research. Check with the staff in charge before you begin your work, otherwise you may not be able to finish your project before a class demands your removal.

Instruction for use of equipment can be obtained from the following people who will take the time to see that you know what you are doing:

1. Dow Building SEM, and Dow Building X-Ray	Sahar Farjami
2. Metallographic equipment including metallographs	Sahar Farjami
3. Furnaces	Ying Qi
4. Hardness testers, impact tester	Sahar Farjami
5. Mechanical testing equipment, hydraulic (MTS)	Sahar Farjami
6. Computers	Kevin Worth
7. Controls and instrumentation, and data acquisition	Ying Qi

USE OF THE VAN VLACK RESEARCH FACILITIES

Van Vlack Undergraduate Labs may be used by graduate students during business hours provided there is no conflict with undergraduate scheduling. During the regular school semester, undergraduates have first call on all equipment in their teaching laboratories. During laboratory classes, the equipment is for the exclusive use of the class.

1. Thermal and Mechanical Processing Laboratory - 2231 Dow
2. Sample Prep Laboratory 2231 Dow
3. Research Metallography Laboratory - 2231 Dow
4. Characterization Laboratories - 2224 Dow

Three department microscopes in the undergraduate laboratory are configured as Image Analysis work stations with B&W CCD cameras and Power Macs equipped with frame-grabber cards and the freeware Image analysis program NIH Image. One of the microscopes is especially equipped for 35mm photography with the department Nikon camera back. The remaining two are equipped for taking 4X5 format Polaroid images.

THE MICHIGAN MATERIALS CHARACTERIZATION CENTER - (MC)²

The mission of (MC)² is to provide cost effective, efficient, safe, and socially responsible access to advanced characterization equipment and expertise. The Center maintains the following equipment:

- Sample preparation equipment
- Veeco Dimension Icon atomic force microscope (AFM)
- Hysitron NanoIndenter
- Kratos X-ray Photoelectron Spectrometer (XPS)
- Cameca LEAP 4000XHR
- Philips XL30FEG scanning electron microscope (FEGSEM)
- FEI Quanta 3D Environmental Scanning Electron Microscope and Focused Ion Beam Workstation (ESEM/FIB)
- FEI Nova NanoLab field emission gun scanning electron microscope and focused ion beam workstation (FEGSEM/FIB)
- FEI Helios NanoLab field emission gun scanning electron microscope and focused ion beam workstation (FEGSEM/FIB)
- JEOL 3100R05 Transmission Electron Microscope (STEM)
- JEOL 3011 Transmission Electron Microscope (HRTEM).
- JEOL 2010F Analytical Scanning Transmission Electron microscope (STEM).
- A number of stages for SEM, FIB, and TEM for cryo, high temperature, straining, or in-situ work.

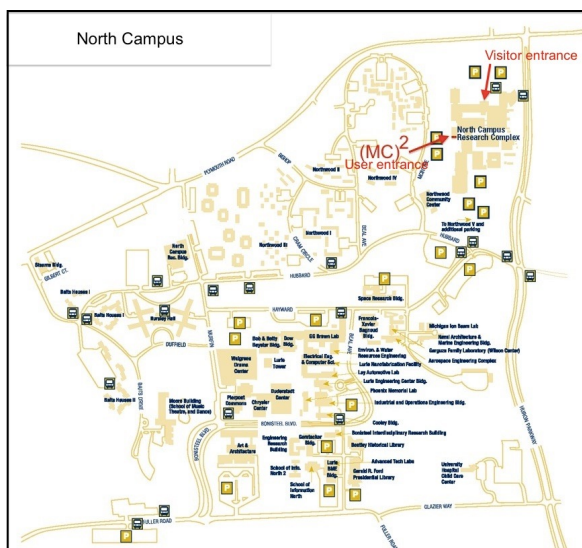
The Center maintains a web site that contains all the information about the laboratory: mc2.engin.umich.edu.

Of particular interest for new users are:

- Registration form: mc2.engin.umich.edu/next-introductory-seminar/
- Procedures for gaining access: mc2.engin.umich.edu/lab-use/become-a-user/
- Instrument scheduling: mc2.engin.umich.edu
- Instrument status: mc2.engin.umich.edu/lab-use/
- Software and instrument manuals: mc2.engin.umich.edu/lab-use/instrument-documentation/
- A number of web cams are also in operation for security purposes and to allow users to determine if an instrument is in use: mc2.engin.umich.edu/techniques/facility-webcams/.

(MC)² has over 450 registered users and trains more than 150 new users per year with a staff of only 3.75 people! If you need to use the facility, please wait until you have samples that you will be working on before asking for training. The (MC)² staff do not train users who do not yet have samples. If they were to do this, then the users would often need re-training by the time they have their research samples, and training is not a free service. You should discuss your experiments with your research supervisor and have a clear idea of what information you are seeking, so (MC)² staff can help you select the appropriate instrument for your work.

The Center is located in NCRC, Building 22. Your U-M card will need to be activated at NCRC in order to enter using the user entrance.



Graduate Program Information



THE GRADUATE COMMITTEE

The PhD Committee and Master's Committees are comprised of MSE faculty members. The department chairperson appoints each member of the committee, and the committee chairperson. In addition, a graduate student representative from the MSE Graduate Student Council will serve with the PhD and Master's Committees. PhD program chair is Geeta Mehta and Master's program chair is Liang Qi.

The PhD and Master's Committees are charged with the general oversight of the graduate program in Materials Science and Engineering. The PhD Committee also coordinates the recruiting and admission of new graduate students into the department. Primary responsibilities include matters related to graduate degree requirements as set forth by the department and by the Rackham Graduate School. Of major importance are the graduate curriculum and examination requirements for the Master's and Ph.D. degrees.

CURRICULUM

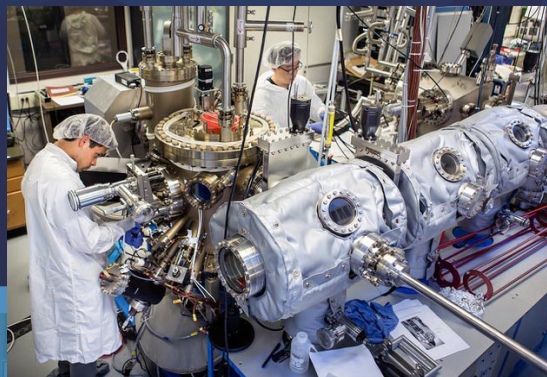
It is the responsibility of the PhD Committee to ensure that the minimum course requirements, as set forth by the MSE faculty and as required by the Rackham Graduate School, are fulfilled by each student. The PhD Committee has the responsibility for evaluating the curriculum and, when appropriate, recommending that changes in course offerings and/or course requirements be instituted.

GRADUATE COMMITTEE CHAIR

The PhD Committee Chair, the Master's Committee Chair and the Graduate Coordinator handle most of the day-to-day operations concerning graduate requirements. There is a moderate amount of paperwork required by the Graduate School as you progress from matriculation to graduation. Most such paperwork is prepared by the Graduate Coordinator, and approved by the Committee Chairs. Occasionally, a student will have an unusual situation, which requires a petition to the Committee. Such petitions should be directed to the PhD or MS Chair who will bring them before the Committee if warranted.

The PhD Chair serves as an interim advisor for new students until they secure a research advisor. Students should work closely with their research advisor in the selection of courses within the department and cognate courses.

Timeline to Your Degree



YEAR

1

- Find PhD advisor
- Start PhD research
- Apply for fellowships
- Apply for awards
- MSE 532,535, 550*
- Cognate courses
- Complete Responsible Conduct of Research Seminars
- Attend seminar
- Annual evaluation

YEAR

2

- Continue PhD research
- Prelim Exam
- Apply for fellowships
- Apply for awards
- Complete coursework
- Attend conference
- Publish research
- Attend seminar
- Annual evaluation

YEARS

3 & 4

- Continue PhD research
- Teaching requirement
- Apply for fellowships
- Apply for awards
- Optional coursework
- Attend conference
- Publish research
- Attend seminar
- Data meeting
- Annual evaluation

YEAR

5

- Complete PhD research
- Apply for your next job
- Apply for awards
- Attend conference
- Publish research
- Attend seminar
- Write and defend thesis
- Celebrate!

Ph.D. degree course requirements

12
CREDITS

MSE Courses 400+ Level

Generally 4 courses,
including core courses



4-6
CREDITS

2 Non-MSE Technical Cognate Courses, 400+ Level

Students must take at least 2 cognate
courses (at least 2 credits each) in a
technical area and obtain a B- or better in
each course.



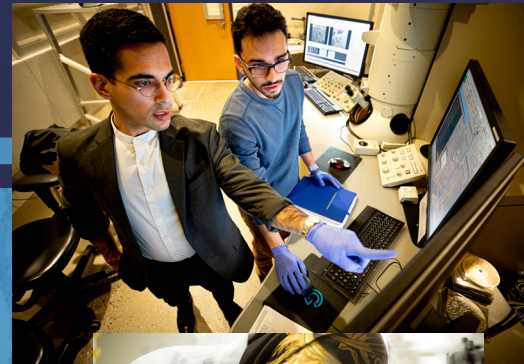
9
CREDITS

Additional MSE or Other Courses

Generally 3 courses, with at least 6 credit hours from a
technical area. Students may count no more than one (1) non-
engineering, professionally related course (e.g., business,
entrepreneurship, public policy, patent law, TechCom,
engineering education, etc.) toward their coursework degree
requirement. This course cannot be used as a cognate and must
be approved by student's advisor.

25-27

CREDITS NEEDED TO GRADUATE



GENERAL REQUIREMENTS - All MSE Graduate Students

The following requirements are departmental; they are meant to provide details beyond those given by the Rackham Graduate School's Academic Policies and Procedures. Where the following requirements conflict Rackham's Policies and Procedures, the Rackham requirements will take precedence.

COGNATES

All students must take two courses (cognates) outside the MSE dept. These cognate courses (each of two credit hours minimum) must be in a technical area and are usually satisfied at the graduate level (400 level courses can also satisfy cognate requirements).

RESEARCH

All graduate students receiving financial support from the MSE dept., from the University, or from a National Fellowship must enroll in MSE 690, 990, or 995 during the term(s) they are supported. The faculty research advisor will work closely with the student to establish a research program and officially evaluate the student's research progress through the grading of MSE 690, 990, or 995. Students must register for at least a total (coursework and research credits) of 8 credit hours at the Master's and Candidate level, and at least 6 credit hours at the Pre-Candidate level, each term to maintain full time status.

DEPARTMENT SEMINAR SERIES

All Ph.D. students and all M.S. students who are enrolled in research and are supported by a fellowship or grant must register for 1 credit of MSE 890 (MSE Colloquium) for 4 semesters and attend at least 70% of the colloquium each semester to receive a satisfactory passing grade. All Ph.D. Candidates and Research Master's students who are enrolled in research and not supported by a grant or fellowship are still required to attend the Colloquium series, but need not enroll in MSE 890. Coursework Master's students who are not enrolled in research are not required to enroll in MSE 890, but may take up to 2 credits of MSE 890.

COURSE SELECTION

All course selections must be approved by the faculty research advisor or the graduate advisor.

Ph.D. CANDIDACY REQUIREMENTS

- Students must show a Bachelor's degree or equivalent awarded by an accredited institution.
- Students must complete at least 18 credit hours (not including 990 research, including the grade of S - Satisfactory) of graded graduate coursework on the Ann Arbor campus.
- Students must take at least 2 cognate courses, at least 2 credits each in a technical area and obtain a B- or better in each course.
- Pre-candidates must enroll in 3 credits of MSE 990 research credits each fall and winter semester until Candidacy. Candidates must enroll in 8 credits of MSE 995 research credits each fall and winter semester until graduation.
- Successful completion of College of Engineering Responsible Conduct of Research & Scholarship/RCRS training.
- A cumulative minimum GPA of B (3.0 on a 4.0 scale) is required for all graduate work taken for credit.
- Successfully pass the Prelim Exam for Candidacy.
- Successfully pass the Qualification Exam Core courses.
- The department expects that students will achieve candidacy within 2 years, although some students may be able to do it sooner. According to Rackham's policies, a student who does not achieve candidacy within three calendar years after the first enrollment in the Rackham doctoral program will be placed on academic probation.
- Candidates may elect one course per term without paying additional tuition beyond candidacy tuition. This course may be taken for credit or as a visit (audit). A student who does not elect a course during a term of 995 enrollment may elect two courses in the next term of 995 enrollment; no more than one course may be deferred in this manner (an additional course may not be taken in anticipation of taking none in a future term of 995 enrollment). Candidates who choose to take more courses than those for which they are eligible with candidacy tuition will be assessed additional tuition per credit hour.

PHD DEGREE REQUIREMENTS

1) CORE COURSES AND QUALIFICATION

Students already in the program (admitted in Winter 2016 or earlier) may choose to complete qualification either with the old process (5 qualification courses) or the new process effective Fall 2016. Students entering the program in Fall 2016 or later will be required to follow the new qualification process described below.

The PhD qualification process in MSE requires the incoming graduate students to take and pass the following core courses, each with at least B+ grade, in their first year:

1. Thermodynamics (MSE 532), offered in the Fall term
2. Kinetics (MSE 535), offered in the Winter term
3. Fundamentals of MS&E (MSE 550), offered in the Fall term

* The core course MSE550 is targeted at students entering the MSE graduate program with a non-MSE undergraduate major such as Physics, Chemistry, etc. Ph.D. students with a non-MSE undergraduate degree but who earned a master's degree in MSE are exempt from taking MSE 550. Students with non-MSE undergraduate degrees may petition the graduate committee to opt out of 550. The petition should provide evidence, through copy of undergraduate transcript, that the student has taken the equivalent of the following required courses in MSE undergraduate curriculum at University of Michigan, and passed each with B+ or higher grade: MSE 220 or 250 (Intro MS&E); MSE 242 (Solid State / Materials Physics); MSE 350 (Structures of Materials); MSE 420 (Mechanical Behavior of Materials).

The written qualifying exam option as a substitute for taking the core courses will no longer be offered, i.e., all incoming students will be required to take and pass the 2 or 3 (as applicable) core courses. However, a student who takes a core course but fails to get a grade of B+ or higher, may petition the graduate committee to take a 'make up' written test in that core course as a second attempt towards qualification. Although the student's grade on the transcript will not change, the score in the 'make up' written test will be used by the graduate committee to determine if the student has met the qualification requirement in that core topic.

A score below B+ in the core course and failure in the following 'make up' written test will result in disqualification from the PhD program.

Students who do not complete all of the above PhD qualification core courses in year 1 may be asked to discontinue from the PhD program.

2) COURSEWORK (Graded)

- 12 credit hours from MSE courses (generally, 4 courses, including core courses)
- Students must take at least 2 cognate courses, at least 2 credits each in a technical area and obtain a B- or better in each course.
- 9 additional credit hours from MSE or other courses (generally, 3 courses) at least 6 credit hours must be from a technical area. Students may count no more than 1 non-engineering, professionally related (e.g. business, entrepreneurship, public policy, patent law, TechCom, engineering education) course toward their coursework degree requirement, which must be approved by the student's advisor (Ph.D.) or Master's Chair (M.S.) This course cannot be used as a cognate.

*Incoming students holding an M.S.E. degree (or equivalent) from another institution must complete 18 credit hours of formal coursework (12 MSE credit hours and 2 cognate courses from a technical area) to fulfill the residency and cognate requirements set forth by the Rackham Graduate School.

3) MSE COLLOQUIUM

Students must enroll in MSE 890 (1 credit) for four semesters and attend 70% of the seminars each semester.

4) PRELIM (THESIS PROPOSAL) EXAM

Students seeking Ph.D. candidacy must successfully pass the Prelim Exam within two years of their initial enrollment in the MSE department. The Prelim Exam will consist of an oral defense of the thesis proposal based on student's research performed as a pre-candidate or, if approved by the faculty research advisor, prior work towards the Master's degree.

A thesis proposal document should be submitted to your committee members 10 working days in advance of the prelim examination; and should provide the motivation for the proposed research based on a critical review of the background and relevant literature, a statement of the objective, a description of the proposed research approach, including new proof-of-concept research results, a thorough analysis of the results, a plan for future research, and a list of references. The document should be less than 20 pages (single-spaced, 12-point font, 1" margins), including figures, but not including references. Successful completion of the prelim exam is a requirement for advancing to candidacy.

The examination is conducted by a committee (selected according to Rackham dissertation committee selection requirements), which is expected to become the doctoral thesis committee if the student becomes a Ph.D. candidate. The committee will report to the Graduate Committee whether the student has passed; and, if not, whether a rescheduled exam is recommended.

5) TEACHING REQUIREMENT

Each student is required to complete one teaching assignment prior to the completion of the Ph.D. degree. Normally this requirement is met after achieving candidacy.

6) DATA MEETING

At least one data meeting is required, no later than 4 years after initial enrollment. Final defense is expected within 1 year after the data meeting.

7) ANNUAL PHD STUDENT EVALUATION FORM

Each Ph.D. student is required to complete an annual student evaluation form with their advisor by May 31st every year. Failure to do so may result in cancellation of GSRA/fellowship support.

8) THESIS AND THESIS DEFENSE

A thesis and its public defense are required for the Ph.D. degree as set forth by the Rackham Graduate School.

PHD DEGREE REQUIREMENTS

GRADUATE COURSES OFFERED WITH MSE COURSE

- The list below only includes 500+ level courses offered at least once since Fall 2014.

- Note that graduate students can take 400-level courses (with advisor approval) and count credits towards their Ph.D. degree requirements.

A) 'Foundation' Courses covering general concepts at the graduate level (including courses cross-listed in MSE)

				<i>Comments</i>
1	MSE 532	Thermodynamics	Offered every Fall	Core course (used for PhD qualification)
2	MSE 535	Kinetics	Offered every Winter	Core course (used for PhD qualification)
3	MSE 550	Fundamentals of MS&E	Offered every Fall	Core course (used for PhD qualification)
4	MSE 560	Structures	Offered every Fall	
5	MSE 500	Materials Physics	Offered every Winter	
6	MSE 520	Mechanical Behavior	Offered every Winter	
7	MSE 512	Polymer Physics	Offered every Winter	
8	MSE 510	Materials Chemistry	Offered every Fall	Offered by Chemistry department; cross-listed in MSE.

B) 'Specialized' Courses (including courses cross-listed in MSE)

			<i>Last Offered</i>
1	517	Functional Polymers: Molecular Design & Applications	F'21: Kim
2	593	Surface and Interfacial Engineering	W'22: Tuteja
	593	Electrochemistry Applications and Engineering	F'21: Singh
	593	Engagement in the Research Process	W'20: Love
	593	Thermodynamics, kinetics and p	F'21: Atzmon
3	593	Cancer Bioengineering	W'22: Mehta
4	593	Fundamentals of Quantum Materials	W'22: Heron
5	593	Data-Driven Matls Design & Gen	W'22: Thornton/Sun

B) 'Specialized' Courses (including courses cross-listed in MSE) - cont'd

6	514	Composite Materials	W'22: Sevensen
7	562	Electron Microscopy	F'21: Hovden
7	515	Polymeric Materials	F'21: Tuteja
8	559	Nanotechnology II	W'22: Laine
9	555	Materials Energy Conversion	F'21: Goldman
11	622	Ion Beam Modifications	W'22: Wang Offered by NERS <u>department</u> ; cross-listed in MSE.
13	577	Failure Analysis of Materials	W'22: Allison
14	554	Computational and Numerical Methods	F'21: Kieffer
15	516	Mechanics of Thin Films and Layered Materials	F'16: Thouless ME department's <u>course</u> ; cross-listed in MSE.
16	593	Battery Basics	F'21: Laine

College of Engineering PhD Full Funding Model and Tuition Support Guidelines

All doctoral students in the College of Engineering are admitted under a policy of full support. Master's students who are approved for a change of program into a doctoral program will receive financial aid at the time of their transfer. As long as standards are achieved and milestones are met, doctoral students who enter with a master's degree receive four years of guaranteed support, and doctoral students who enter with a bachelor's degree receive five years of guaranteed support.

The College of Engineering and Rackham have designated special funds for tuition support. Fall or winter tuition support, with GradCare, may be requested for students admitted to any CoE doctoral program.

This tuition support applies only to students in College of Engineering graduate programs, without regard to the home unit of the student's advisor.

One term of funding may be requested for students within the four or five year commitment:

- A student who is on an internship.
- A student who is required to register due to the requirements of the Rackham Continuous Enrollment policy.
- A student who requires funding due to unforeseen circumstances such as a family or medical emergency or a period of transition between research advisors when resources, such as a GSI appointment, from the student's home program are unavailable or insufficient.

The criteria are:

- Ph.D. Candidate (full tuition) or Pre-candidate (one credit of pre-candidate tuition if needed to keep the student enrolled);
- Making satisfactory academic progress as judged by program faculty;
- Not otherwise supported with a GSRA or GSI position or with a fellowship that includes tuition coverage.

The general expectation is that the faculty advisor will provide student funding. If the advisor cannot fully fund a student, the department/program should provide GSI or fellowship funding. If the department/program and advisor are unable to provide full funding support, the College may cost share the funding shortfall, or in extraordinary circumstances, provide full funding.

The College or Rackham may provide one term of Fall or Winter tuition support for students on internship who are not in their final semester of their doctoral program.

To request support and consider other funding resources for graduate students, the graduate chair or his/her designee should refer to the Graduate Department/Program funding webpage for more information.

The Rackham Graduate Student Emergency Fund

The Rackham Graduate Student Emergency Fund is intended to help meet the financial needs of Rackham graduate students who encounter an emergency situation or one-time, unusual, or unforeseen expenses during their degree program. Examples include:

- Medical, dental, or mental health emergencies for the student or, in some circumstances, for immediate family members who live with the student
- Major accidents and events such as fire and natural disasters
- Expenses related to the death of an immediate family member

Normal living expenses such as rent, car repairs, child care, utilities, taxes, insurance, pet-related expenses, and computer/laptop replacement are generally not covered by this fund.

An "immediate family member" is defined as a student's spouse or other qualified adult (who shares a primary residence with you and has done so for the previous six continuous months, other than as your employee or tenant) or the son, daughter, parent, grandparent, grandchild, brother, sister (or the spouse of any of them), of either the student, the student's spouse, the other qualified adult, or any other related person living in the student's household. We acknowledge that students have family relationships that extend beyond their household. As our focus is on assisting the greatest number of Rackham graduate students—with limited funds at our disposal—requests must adhere to this guideline.

Eligibility

Students must be enrolled in a Rackham degree program. Rackham doctoral students are limited to two (2) Emergency Fund awards and master's students are limited to one (1) Emergency Fund award during their graduate career. Ph.D. students on an approved leave of absence are eligible if they were in good academic standing at the beginning of the period of leave, have an approved plan for return to active study at the conclusion of the leave, and experience an emergency situation or unforeseen expense that would interfere with their ability to return to active study as planned.

Students who are experiencing financial difficulties that exceed the scope of this fund may request a meeting with Rackham staff to further explore the difficulties they are experiencing. Staff will be in touch with students to help address needs, concerns, and to assist with campus referrals, as appropriate.

Deadline

Applications from students are reviewed on a rolling basis once the application is complete.

Award Description

Awards may be up to \$2,500 each. For students who qualify for need-based financial aid (including the child care subsidy), receipt of this Rackham award may reduce the original loan amount or subsidy. Please contact the Office of Financial Aid prior to submitting your application for help evaluating your individual circumstance and possible impact to your financial aid.

Application Process

Students should apply online. (<https://secure.rackham.umich.edu/Fellowships/apps/index.php?entry=8>) Before applying for emergency funds, students are encouraged to speak to their faculty advisors and the graduate chairs of their programs. These individuals may be able to help identify sources of financial assistance and/or provide useful advice. The online application includes the following:

- Brief statement describing the emergency situation or one-time, unusual, or unforeseen expense and the total dollar amount of emergency funds being requested. (1,500 words)
- Budget detailing the amount of emergency funding requested, a list of current expenses and an itemized list of how the funds will be used, and your financial situation including sources of income and other available funding. (1,500 words)

MASTER'S DEGREE REQUIREMENTS

MASTER OF SCIENCE IN ENGINEERING - M.S.E. - DEGREE REQUIREMENTS

as voted on by the faculty on May 5, 2020

Two different types of Master's. degrees are offered: one with an emphasis on research (Research Masters) and one with a primary focus on coursework (Coursework Masters). Students supported with a GSRA or research fellowship, must pursue a Research masters rather than a Coursework masters.

GENERAL REQUIREMENTS

The following requirements are departmental; they are meant to provide details beyond those given by the Rackham Graduate School's Academic Policies and Procedures. Where the following requirements conflict Rackham's Policies and Procedures, the Rackham requirements will take precedence.

RESEARCH

All M.S.E. students receiving financial support from the MSE dept., from the University, or from a National Fellowship must enroll in MSE 690 during the term(s) they are supported. The faculty research advisor will work closely with the student to establish a research program and officially evaluate the student's research progress through the grading of MSE 690. Students must register for at least a total (coursework and research credits) of 8 credit hours each term to maintain full time status.

DEPARTMENT SEMINAR SERIES

All M.S.E. students who are enrolled in research and are supported by a fellowship or grant must register for 1 credit of MSE 890 (MSE Colloquium) for up to 4 semesters and attend at least 70% of the colloquium each semester to receive a satisfactory passing grade. All Research Master's students may take up to 2 semesters (2 credits) of 890 but it is not required. Coursework Master's students who are not enrolled in research are not required to enroll in MSE 890, but may take up to 2 credits of MSE 890.

COURSE SELECTION

All course selections must follow the course structure described for each of the two tracks (Research Master's and Coursework Master's and must be approved by the MSE Master's Chair.

I - RESEARCH MASTER'S

This degree emphasizes Research skills suitable for students targeting Ph.D. study or a career as research scientist/engineer in R&D organizations and industry. Therefore, the curriculum is structured to enable students to develop skills and knowledge in at least one of the following five (5) major areas of research specialization/concentration: (1) Computational and Data-Driven Materials Science; (2) Energy, Electronic and Quantum Materials; (3) Polymer and Bio Materials; (4) Metallic and Structural Materials; (5) Advanced Materials Characterization.

Students seeking a Research Master's degree must complete 30 credit hours of coursework including research credits.

Graduate courses offered towards the 30 credit hours are divided into three modules/categories.

- i) Foundation courses (minimum of 6 to maximum of 9 credit hours)
- ii) Elective courses (maximum of 9 credit hours)
- iii) Specialized courses and research (minimum of 15 credit hours)

Foundation courses:

- i) MSE 532 (Advanced Thermodynamics of Materials; 3 credit hours)
- ii) MSE 535 (Kinetics, Phase Transformations and Transport; 3 credit hours)

These courses are required for all students enroll in Research Masters track.

In addition, MSE 550 (Fundamentals of Materials Science and Engineering; 3 credit hours) is also required for students without undergraduate degree in Materials Science and Engineering.

Elective courses:

Students may count up to 9 credit hours within this module. Up to 2 non-MSE courses (maximum of 6 credit hours) may be counted toward the 9 credits. One non-MSE course can be a non-engineering, professionally related (e.g., Business, Entrepreneurship, Public Policy, Patent Law, TechCom, Engineering Education) course. The other non-MSE course must be a graduate level Engineering or Science course. These non-MSE courses MUST be approved by the Master's committee.

Specialized courses and research:

Courses selection within this category will determine the specialization track, which will appear on the Master's degree transcript, and must include hands on research experience (MSE 690 or research internship at industry) within the area of specialization.

Students must count a minimum of 15 credit hours within this module.

i) All students enrolled in Research Master's track must take at least two additional MSE courses (6 credits) in the area of the specialization (see list of courses for details).

ii) All students enrolled in Research Master's track must also take a minimum of 9 credits (maximum of 12 credits) of MSE 690.

- Research Problems in Materials Science and Engineering toward the MSE 690 credits must be conducted with a MSE faculty mentor in their research lab. The MSE 690 research topic must align with the area of specialization.
- With approval from Master's committee, research internship at industry may be considered if it involves a UM MSE faculty mentor.
- Students must submit a Master's thesis to an examining committee of three faculty members, two of which must be from MSE. This committee will include the research advisor and two other faculty selected by the advisor in consultation with the student and approved by the Master's Committee Chair.
- The thesis must be defended orally before this committee and approved by a majority of the committee and the advisor.
- This thesis should contain a critical review of background information and relevant literature, a statement of objective, a results section, and a thorough scientific analysis of these results. It should have a degree of originality suitable for publication.
- In the event that the student is not satisfied with the results of his/her examination(s), an appeal for arbitration can be made in sequence to the Master's committee chair, the Dept. chair, the Rackham Graduate School or the College of Engineering Ombudsman.

RESEARCH MASTER'S DEGREE REQUIREMENTS

List of courses for Research Master's track organized by research specialization/concentration

The tables provided should be used as guide for course selection.

COMPUTATIONAL AND DATA-DRIVEN MATERIALS SCIENCE

	Fall	Winter
Foundation courses (Credits: 6 or 9)	MSE 532 (3): Advanced Thermodynamics of Materials	MSE 535 (3): Kinetics, Phase Transformations and Transport
	(1) MSE 550 (3): Fundamentals of Materials Science and Engineering	
(2) Elective courses (Max credits: 9)	MSE 560 (3): Structures of Materials	MSE 500 (3): Materials Physics and Chemistry
	MSE 510 (3): Materials Chemistry	MSE 520 (3): Advanced Mechanical Behavior
	MSE 517 (3): Advanced Functional Polymers: Molecular Design and Applications: Molecular Design and Applications	MSE 512 (3): Polymer Physics
	MSE 554 (3): Computational Methods in MS&E and ChemE	MSE 514 (3): Composite Materials
	MSE 562 (3): Electron Microscopy I	
	MSE 410 (3): Design and Applications of Biomaterials	MSE 577 (3): Failure Analysis of Materials of Materials
	MSE 412 (3): Polymeric Materials	MSE 440 (3): Ceramics Materials
	MSE 420 (3): Mechanical Behavior of Materials	MSE 465 (3): Structural and Chemical Characterization of Materials
	MSE 470 (3): Physical Metallurgy	MSE 555 (3): Materials Energy Conversion
	MSE 559 (3): Foundations Nano II	
Specialized courses (Min credits: 15)	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering
	MSE 454 (3): Computational Approaches in MSE	MSE 556 (3): Molecular Simulation
	MSE 593 (3): Special Topics	MSE 593 (3): Data-Driven Materials Design and Genomics
		MSE 593 (3): Special Topics

(1) Required only for students without undergraduate degree in MSE

(2) Students may count up to 2 **non-MSE** courses (up to 6 credits) toward the 9 credits. One **non-MSE** course can be a non-engineering, professionally related (e.g. Business, entrepreneurship, public policy, patent law, TechCom, Engineering education); and the other non-MSE course must be a **graduate level** Engineering or Science course.

ENERGY, ELECTRIC AND QUANTUM MATERIALS

	Fall	Winter
Foundation courses (Credits: 6 or 9)	MSE 532 (3): Advanced Thermodynamics of Materials	MSE 535 (3): Kinetics, Phase Transformations and Transport
	⁽¹⁾ MSE 550 (3): Fundamentals of Materials Science and Engineering	
(2) Elective courses (Max credits: 9)	MSE 454 (3): Computational Approaches in MSE	MSE 500 (3): Materials Physics and Chemistry
	MSE 510 (3): Materials Chemistry	MSE 520 (3): Advanced Mechanical Behavior
	MSE 517 (3): Advanced Functional Polymers: Molecular Design and Applications	MSE 512 (3): Polymer Physics
	MSE 554 (3): Computational Methods in MS&E and ChemE	MSE 514 (3): Composite Materials
	MSE 562 (3): Electron Microscopy I	MSE 577 (3): Failure Analysis of Materials
	MSE 410 (3): Design and Applications of Biomaterials	MSE 465 (3): Structural and Chemical Characterization of Materials
	MSE 412 (3): Polymeric Materials	MSE 593 (3): Special Topics
	MSE 420 (3): Mechanical Behavior of Materials	MSE 556 (3): Molecular Simulation
	MSE 470 (3): Physical Metallurgy	MSE 593 (3): Data-Driven Materials Design and Genomics
Specialized courses (Min credits: 15)	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering
	MSE 560 (3): Structures of Materials	MSE 440 (3): Ceramics Materials
		MSE 593 (3): Quantum Materials
	MSE 593 (3): Special Topics	MSE 555 (3): Materials Energy Conversion
	MSE 559 (3): Foundations Nano II	MSE 593 (3): Special Topics

(1) Required only for students without an undergraduate degree in MSE

(2) Students may count up to 2 **non-MSE courses** (up to 6 credits) toward the 9 credits. One **non-MSE** course can be a non-engineering, professionally related (e.g. Business, entrepreneurship, public policy, patent law, TechCom, Engineering education); and the other non-MSE course must be a **graduate level** Engineering or Science course.

RESEARCH MASTER'S DEGREE REQUIREMENTS

POLYMER AND BIO MATERIALS

	Fall	Winter
Foundation courses (Credits: 6 or 9)	MSE 532 (3): Advanced Advanced Thermodynamics of Materials of Materials	MSE 535 (3): Kinetics, Phase Transformations and Transport, Phase Transformations and Transport
	(1) MSE 550 (3): Fundamentals of Materials Science and Engineering	
(2) Elective courses (Max credits: 9)	MSE 454 (3): Computational Approaches in MSE	MSE 500 (3): Materials Physics and Chemistry
	MSE 510 (3): Materials Chemistry	MSE 520 (3): Advanced Mechanical Behavior
	MSE 554 (3): Computational Methods in MS&E and ChemE	MSE 514 (3): Composite Materials
	MSE 562 (3): Electron Microscopy I	MSE 577 (3): Failure Analysis of Materials of Materials
	MSE 420 (3): Mechanical Behavior of Materials	MSE 465 (3): Structural and Chemical Characterization of Materials
	MSE 470 (3): Physical Metallurgy	MSE 556 (3): Molecular Simulation
	MSE 560 (3): Structures of Materials	MSE 440 (3): Ceramics Materials
		MSE 593 (3): Quantum Materials
	MSE 559 (3): Foundations Nano II	MSE 555 (3): Materials Energy Conversion
		MSE 593 (3): Data-Driven Materials Design and Genomics
Specialized courses (Min credits: 15)	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering
	MSE 412 (3): Polymeric Materials	MSE 512 (3): Polymer Physics
	MSE 517 (3): Advanced Functional Polymers: Molecular Design and Applications	MSE 593 (3): Surface and Interfacial Engineering
	MSE 410 (3): Design and Applications of Biomaterials	MSE 593 (3): Special Topics
	MSE 593 (3): Special Topics	

(1) Required only for students without an undergraduate degree in MSE

(2) Students may count up to 2 **non-MSE courses** (up to 6 credits) toward the 9 credits. One **non-MSE** course can be a non-engineering, professionally related (e.g., Business, entrepreneurship, public policy, patent law, TechCom, Engineering education); and the other non-MSE course must be a **graduate level** Engineering or Science course.

METALLIC AND STRUCTURAL MATERIALS

	Fall	Winter
Foundation courses (Credits: 6 or 9)	MSE 532 (3): Advanced Advanced Thermodynamics of Materials of Materials	MSE 535 (3): Kinetics, Phase Transformations and Transport, Phase Transformations and Transport
	(1) MSE 550 (3): Fundamentals of Materials Science and Engineering	
(2) Elective courses (Max credits: 9)	MSE 454 (3): Computational Approaches in MSE	MSE 500 (3): Materials Physics and Chemistry
	MSE 510 (3): Materials Chemistry	MSE 520 (3): Advanced Mechanical Behavior
	MSE 554 (3): Computational Methods in MS&E and ChemE	MSE 514 (3): Composite Materials
	MSE 562 (3): Electron Microscopy I	MSE 577 (3): Failure Analysis of Materials of Materials
	MSE 420 (3): Mechanical Behavior of Materials	MSE 465 (3): Structural and Chemical Characterization of Materials
	MSE 470 (3): Physical Metallurgy	MSE 556 (3): Molecular Simulation
	MSE 560 (3): Structures of Materials	MSE 440 (3): Ceramics Materials
		MSE 593 (3): Quantum Materials
	MSE 559 (3): Foundations Nano II	MSE 555 (3): Materials Energy Conversion
		MSE 593 (3): Data-Driven Materials Design and Genomics
Specialized courses (Min credits: 15)	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering
	MSE 412 (3): Polymeric Materials	MSE 512 (3): Polymer Physics
	MSE 517 (3): Advanced Functional Polymers: Molecular Design and Applications	MSE 593 (3): Surface and Interfacial Engineering
	MSE 410 (3): Design and Applications of Biomaterials	MSE 593 (3): Special Topics
	MSE 593 (3): Special Topics	

(1) Required only for students without an undergraduate degree in MSE

(2) Students may count up to 2 **non-MSE courses** (up to 6 credits) toward the 9 credits. One **non-MSE** course can be a non-engineering, professionally related (e.g., Business, entrepreneurship, public policy, patent law, TechCom, Engineering education); and the other non-MSE course must be a **graduate level** Engineering or Science course.

RESEARCH MASTER'S DEGREE REQUIREMENTS

ADVANCED MATERIALS CHARACTERIZATION

	Fall	Winter
Foundation courses (Credits: 6 or 9)	MSE 532 (3): Advanced Thermodynamics of Materials	MSE 535 (3): Kinetics, Phase Transformations and Transport
	⁽¹⁾ MSE 550 (3): Fundamentals of Materials Science and Engineering	
(2) Elective courses (Max credits: 9)	MSE 560 (3): Structures of Materials	MSE 500 (3): Materials Physics and Chemistry
	MSE 510 (3): Materials Chemistry	MSE 520 (3): Advanced Mechanical Behavior
	MSE 517 (3): Advanced Functional Polymers: Molecular Design and Applications	MSE 512 (3): Polymer Physics
	MSE 554 (3): Computational Methods in MS&E and ChemE	MSE 514 (3): Composite Materials
	MSE 562 (3): Electron Microscopy I	
	MSE 410 (3): Design and Applications of Biomaterials	MSE 577 (3): Failure Analysis of Materials of Materials
	MSE 412 (3): Polymeric Materials	MSE 440 (3): Ceramics Materials
	MSE 420 (3): Mechanical Behavior of Materials	MSE 465 (3): Structural and Chemical Characterization of Materials
	MSE 470 (3): Physical Metallurgy	MSE 555 (3): Materials Energy Conversion
	MSE 559 (3): Foundations Nano II	
Specialized courses (Min credits: 15)	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering	MSE 690 (9 to 12 credits) Research Problems in Materials Science and Engineering
	MSE 454 (3): Computational Approaches in MSE	MSE 556 (3): Molecular Simulation
	MSE 593 (3): Special Topics	MSE 593 (3): Data-Driven Materials Design and Genomics
		MSE 593 (3): Special Topics

(1) Required only for students without an undergraduate degree in MSE

(2) Students may count up to 2 non-MSE courses (up to 6 credits) toward the 9 credits. One non-MSE course can be a non-engineering, professionally related (e.g., Business, entrepreneurship, public policy, patent law, Tech-Com, Engineering education); and the other non-MSE course must be a graduate level Engineering or Science course.

COURSEWORK MASTER'S DEGREE REQUIREMENTS

II- COURSEWORK MASTERS

This degree emphasizes fundamental knowledge in a wide variety of modern, advanced materials development and applications. Students seeking a coursework M.S.E. degree must complete 30 credit hours of coursework, which may include research credits. Of the 30 credit hours, at least 15 credit hours of MSE department courses (excluding MSE 690) must be taken. Graduate courses offered towards the 30 credit hours are divided into two modules/categories.

- i) Foundation courses (minimum of 12 credit hours)
- ii) Elective courses (maximum of 18 credit hours)

Foundation courses: Students must select a minimum of four courses (12 credits) within this category/module

	Fall	Winter
Foundation courses (Credits: at least 12 credits)	MSE 532 (3): Advanced Thermodynamics of Materials	MSE 535 (3): Kinetics, Phase Transformations and Transport
	⁽¹⁾ MSE 550 (3): Fundamentals of Materials Science and Engineering	MSE 520 (3): Advanced Mechanical Behavior
	MSE 560 (3): Structures of Materials	MSE 500 (3): Materials Physics and Chemistry and Chemistry
	MSE 510 (3): Materials Chemistry	MSE 465 (3): Structural and Chemical Characterization of Materials

(1) MSE 550 is mandatory for students without an undergraduate degree in MSE.

Elective courses: Students can select a number of courses (up to 18 credits) within this category/module. Student may count up to 3 non-MSE courses (up to 9 credits) toward the 18 credits. One of the non-MSE course can be a non-engineering, professionally related course (e.g. Business, entrepreneurship, public policy, patent law, Techcom, Engineering education). The other 2 non-MSE courses must be graduate level Engineering or Science courses. These non-MSE courses MUST be approved by the Master's committee.

	Fall	Winter
Elective courses (Max credits: 18)	MSE 454 (3): Computational Approaches in MSE	MSE 512 (3): Polymer Physics
	MSE 517 (3): Advanced Functional Polymers: Molecular Design and Applications	MSE 514 (3): Composite Materials
	MSE 554 (3): Computational Methods in MS&E and ChemE	MSE 556 (3): Molecular Simulation
	MSE 470 (3): Physical Metallurgy	MSE 440 (3): Ceramics Materials
	MSE 412 (3): Polymeric Materials	MSE 593 (3): Quantum Materials
	MSE 410 (3): Design and Applications of Biomaterials	MSE 555 (3): Materials Energy Conversion
	MSE 420 (3): Mechanical Behavior of Materials	MSE 577 (3): Failure Analysis of Materials
	MSE 562 (3): Electron Microscopy I	MSE 593 (3): Data-Driven Materials Design and Genomics
	⁽²⁾ MSE 690 (Max credits: 8): Research Problems in Materials Science and Engineering	MSE 593 (3): Surface and Interfacial Engineering
	MSE 593 (3): Special Topics	⁽²⁾ MSE 690 (Max credits: 8): Research Problems in Materials Science and Engineering
	MSE 559 (3): Foundations Nano II	MSE 593 (3): Special Topics

(2) Of the 18 credit hours, up to 8 hours may be satisfied by MSE 690 (Research Problems in MSE). Students taking MSE 690 must submit a research report commensurate with the number of MSE 690 credits taken. This report must be approved by the project supervisor.

SUGS DEGREE REQUIREMENTS

SUGS Coursework M.S.E.

SUGS/SGUS (Sequential Undergraduate/Graduate Studies)

The Rackham SUGS program was developed to promote greater enrollment of qualified College of Engineering students in the Master's Program by making it possible for students to pursue a five-year combined B.S.E./M.S.E, B.S.E./M.S. The program does not require a dual enrollment, though a minimum of two full terms (minimum of 9 credit hours each term) of graduate enrollment in Rackham only is required.

SGUS students must complete 30 credit hours (coursework and research credits) of graduate level courses per the coursework M.S.E. degree requirements described above.

- i) Foundation courses (minimum of 12 credit hours)
- ii) Elective courses (maximum of 18 credit hours)

Of the 30 credit hours, at least 15 credit hours of MSE department courses (excluding MSE 690) must be taken.

FOUNDATION COURSES

SUGS students must select a minimum of four courses (12 credits) within this category/module.

	Fall	Winter
Foundation courses (Credits: at least 12 credits)	MSE 532 (3): Advanced Thermodynamics of Materials	MSE 535 (3): Kinetics, Phase Transformations and Transport
	MSE 560 (3): Structures of Materials	MSE 520 (3): Advanced Mechanical Behavior
	MSE 510 (3): Materials Chemistry	MSE 500 (3): Materials Physics and Chemistry and Chemistry
		MSE 465 (3): Structural and Chemical Characterization of Materials

ELECTIVE COURSES

SUGS students can select a number of undergrad and graduate level courses (up to 18 credits) within this category/module.

- SUGS students may double count up to 9 credit hours of non-required B.S.E. undergrad coursework toward the 18 credit hours. Required undergraduate courses will not be double counted, but courses elected to meet technical or free elective B.S.E. requirements may be double counted.
- Up to 6 credit hours of the undergrad program can be transferred to the master's degree and counted toward the 18 credit hours.
- All courses to be double counted or transferred are to be approved by the MSE Undergrad Program Advisor.
- Of the 18 credit hours, up to 8 credit hours may be satisfied by MSE 690 (Research Problems in Materials Science and Engineering). Students taking MSE 690 must submit a research report commensurate with the number of MSE 690 credits taken. This report must be approved by the project supervisor.
- SUGS students must enroll in Rackham only for two full terms minimum, paying full tuition. Engineering or Science courses. These non-MSE courses MUST be approved by the Master's committee.

Materials Science and Engineering
PhD Student Annual Academic Evaluation Form
(Sample form – form is now an electronic process)

|

Formal annual reviews of graduate students are required. The annual review is expected to be completed by the end of May each year. A formal review will become part of the permanent student record.

Review Period:

Student's Name:

Current Status (Pre-Cand, Candidate):

First Term:

Name of Faculty Advisor:

A. Please indicate the term and year in which this student completed or is expected to complete the following requirements (student completes, advisor verifies, please choose N/A if not applicable)

	Term	Year
Entered PhD program		
Core Courses		
Coursework		
Oral Prelim		
Achieve Candidacy		
Teaching requirement		
Research		
Data Meeting		
Expected PhD Defense		

B. List of courses taken and grades:

Course	Term	Grade

C. Please list accomplishments and efforts for this evaluation period:

Student Comments:

Advisor Comments:

D. Please list goals/objectives for the upcoming year:

Student Comments:

Advisor Comments:

E. Please comment on the student's development on skills, effort and performance in the following areas:

1. Communication skills (writing, presentations, posters, etc.):

Student Comments:

Advisor Comments:

2. Research skills:

Student Comments:

Advisor Comments:

2. Any Additional Comments:

Student Comments:

Advisor Comments:

This form is to be signed after discussion of the annual evaluation by the student and his or her faculty advisor.

Faculty Advisor Signature & Date: _____

Student Signature & Date: _____

MSE PhD Student-Faculty Advisor Matching Process

Winter Term: PhD students are admitted with a commitment to a specific research group.

Fall Term: PhD students are admitted to a pool, without a commitment to a specific research group. Below is the timeline for the student-faculty matching process for Fall Term admits:

- December/January/February: Fall term admits to the PhD program are notified of admission and invited to visit during two possible visit dates in March or during a weekend of his/her choice.
- March/April: During the group visits, PhD students are exposed to potential research topics during brief presentations by all research-active faculty, individual visits with faculty, and laboratory tours by current students and post-docs. Similar arrangements are made for those who visit individually.
- May-August: Although the Fall term admits to the PhD program are not required to choose the advisor prior to the fall term, some matching is done during the visit or through communications afterwards. In addition, some domestic PhD students arrive in the summer to get started on research projects.
- August/September: Upon arrival in the fall, the Grad Chair encourages PhD students to meet with at least 3 research groups prior to making a final decision on an advisor. To facilitate the process, a series of 30-minute presentations by research-active faculty are made during the first 2-3 weeks of the semester.
- October 31: PhD students should choose an advisor by October 31. The choice is documented by an e-mail from the PhD student to the Grad Coordinator, who then confirms with the faculty member via e-mail. In consultation with the Grad Coordinator, the Grad Chair follows up with those PhD students who have not yet chosen an advisor. For example, the Grad Chair may inform the student of GSRA openings and offer to introduce him/her to potential advisors.

MSE Advising Form

This form can also be downloaded as a spreadsheet on the MSE website:

<http://www.mse.engin.umich.edu/graduate/graduate-advising-form.pdf>

MSE Advising, Course Plan & Degree Requirement Check List

Name		Ph.D.	
UMID			
Advisor			

Coursework: MSE Courses (at least 12 MSE coursework credits) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course #</th> <th># Credits</th> <th>Term</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table> Total MSE Coursework: 0 Cognate Courses (two cognate courses required, at least 2 credits ea.) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course #</th> <th># Credits</th> <th>Term</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table> Total Cognates: 0 MSE 990 Research Credits (at least 9 research credits total are required for PhD, 3 per semester) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course #</th> <th># Credits</th> <th>Term</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table> Total MSE Research: 0 Colloquium MSE 890 (Ph.D. supported students need at least 4 semesters of MSE 890) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course #</th> <th># Credits</th> <th>Term</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table> Total Colloquium: 0	Course #	# Credits	Term																												Course #	# Credits	Term							Course #	# Credits	Term										Course #	# Credits	Term													Other Courses (can be MSE, non-MSE or 1 business non-engineering type course) <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Course #</th> <th># Credits</th> <th>Term</th> </tr> </thead> <tbody> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </tbody> </table> Total Other: 0 Qualification: Course Grade: <table style="width: 100%;"> <tr> <td style="width: 50%;">MSE 532</td> <td style="width: 50%; border: 1px solid black;"></td> </tr> <tr> <td>MSE 535</td> <td style="border: 1px solid black;"></td> </tr> </table> Prelim/Thesis Proposal Exam (date): Data Meeting (date): Dissertation Committee Form: Teaching Requirement (term/yr): Notes:	Course #	# Credits	Term													MSE 532		MSE 535	
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Candidacy Requirements:

- Students must show a [Bachelor's](#) degree or equivalent awarded by an accredited institution.
- Students must complete at least 18 hours ([not including research](#)) of graded graduate coursework on the Ann Arbor campus.
- Student must complete 4 credit hours of cognate coursework with a grade of B- or better.
- Successful completion of College of Engineering Responsible Conduct of Research & Scholarship/RCRS training.
- A cumulative minimum GPA of B (3.0 on a 4.0 scale) is required for all graduate work taken for credit.
- Successfully pass the Prelim Exam for Candidacy.
 - Successfully pass the Qualification Exam Core areas.

The department expects that students will achieve candidacy within 2 years, although some students may be able to do it sooner. According to Rackham's policies, a student who does not achieve candidacy within three calendar years after the first enrollment in the Rackham doctoral program will be placed on academic probation.

Materials Science and Engineering
PRELIM EXAM REPORT FORM
(See reverse side for instructions and make-up of committee members)

Student Name: _____

UMID# _____

Campus ID (username) _____

Report Title: _____

Prelim Exam Date: _____

PRELIM EXAM COMMITTEE

	<i>"My signature below indicates that I concur with the decision indicated below."</i>
(Please print names of committee below)	_____
Chair (Student's Advisor): _____	_____
Other MSE Member: _____	_____
Cognate Member _____	_____
4 th Member (Optional for Prelim Exam) _____	_____

GRADUATE COMMITTEE CHAIR APPROVAL OF COMMITTEE: _____

DATE: _____

DECISION OF COMMITTEE

Master's Requirement	☐ Pass
	☐ Fail
	☐ Not Applicable

Doctoral Qualifying Requirement	☐ Pass
	☐ Fail
	☐ Not Applicable

(CHECK ONE RESPONSE IN EACH BLOCK ABOVE!)

(Please return this completed form to the Graduate Program Coordinator immediately after the Exam.)

PRELIM EXAM

Committee make-up:

The prelim exam committee will include at least three members, the research advisor, one other MSE faculty and one cognate member, picked by the advisor in consultation with the student and approved by the Graduate Committee Chair before your exam.

The thesis must be defended orally before this committee and approved by a majority of the committee and the advisor.

Master's Requirement:

Students must submit a master's thesis to an examining committee of three faculty members, two of which must be from Materials Science and Engineering.

Doctoral Qualifying Requirement:

A thesis proposal document should be submitted 10 working days in advance of the oral examination; and should provide the motivation for the proposed research based on a critical review of the background and relevant literature, a statement of the objective, a description of the proposed research approach, including new proof-of-concept research results, a thorough analysis of the results, a plan for future research, and a list of references. The document should be less than 20 pages (single-spaced, 12-pt. font, 1" margins), including figures, but not including references. Successful completion of the oral exam is a requirement for advancing to candidacy.

Instructions before exam:

- Consult with advisor to choose committee members.
- Write committee member's names on the front of this form.
- Return form to Renee, she will obtain the signature of committee approval from the Graduate Committee Chair.

After exam:

- Committee members check off their decision in both Master's and Doctoral boxes.
- Committee members sign next to their printed name.
- Return form to Renee following the exam.



DATA MEETING FORM

Name of Student (Please print): _____ Date: _____

1. Report of the meeting of the research results presented by the candidate:

2. Specific recommendations for further research work:

3. Other requirements set by the Dissertation Committee:

4. The Dissertation Committee recommends the student write his/her dissertation:

YES _____ NO _____
5. The Committee agrees to the following time schedule for the preparation of the dissertation and its defense.*

*The Department expects the Dissertation Chair to read and approve a draft of the Dissertation before it is distributed to other Committee members.

The required signatures of all Committee members indicate approval of the specifications listed above.

Please return the signed, completed form to the Graduate Office.

GSRA VACATIONS

Approved December 8, 2023

This policy provides a baseline framework. Individual advisors may choose to add more details to fit the needs and culture of their research groups. If you have any questions about how the policy will be implemented in your group, please contact your advisor.

Note that this policy applies only to GSRA. GSIs are governed by the GEO agreement, and other funding sources may have different vacation policies.

- GSRA are entitled to two weeks (10 business days) of vacation per calendar year
 - This is separate from other leaves (i.e., University holidays, sick leave, FMLA leave, etc.)
 - Note that academic breaks like Spring Break are not University holidays and would count as vacation
 - Advisors have discretion to adjust upward and/or to allow vacation accrual
- Vacation dates must be approved by research advisor
 - Student is expected to:
 - Request dates in writing as soon as possible, at least 14 days ahead of time
 - Recognize that the needs of the lab group may restrict available dates
 - Advisor is expected to:
 - Make his/her best effort to grant requests
 - Provide written feedback promptly

STUDENT SUPPORT RESOURCES

While the university is big, we are a small community and we look out for one another. MSE cares about your well-being and we want to make sure you are aware of the resources available to you should you encounter any issues.

If you are ill and don't expect to be attending class or reporting to your lab, please reach out to your advisor and/or a lab-mate to let them know. This helps everyone to know you are okay and when to expect you back.

MSE Dept. Leadership Resources:

- Elizabeth Holm, MSE Department Chair
- Geeta Mehta, PhD Chair
- John Allison, MSE Ombudsman
- Renee Hilgendorf, Graduate Program Advisor
- Liang Qi, Master's Chair
- Steve Yalisove, Undergrad Program Advisor
- Todd Richardson, MSE Lead Department Administrator

STUDENT SUPPORT RESOURCES (CONT'D)

If you find yourself under health or mental distress, you can access the following resources below:

CARE Center @ the College of Engineering is a dedicated office to provide support for students' academic, personal and professional development. Their office works with faculty, staff, and students across campus, as well as with parents and community members to reach this goal. You can make an appointment online here <https://care.engin.umich.edu/> or call (734) 615-1405.

CAPS: CAPS offers short term counseling and therapy and can also assist in connecting and supporting mental health resources in the community. CAPS works with students who are encountering academic stress, difficulty adjusting to challenging situations, and mental health concerns.

- **Central Campus:**
 - <https://caps.umich.edu/>
 - 734-764-8312
- **CoE CAPS Embedded Counselor**
 - <https://caps.engin.umich.edu/>
 - caps-engin@umich.edu (Email for appointment)
- **Rackham**
 - <https://rackham.umich.edu/rackham-life/help-and-support/>
 - lauralm@umich.edu

Urgent Contacts:

Life Threatening Emergencies: Call 911

U-M Psychiatric Emergency (24-hour): 734-996-4747

Sexual Assault Prevention and Awareness Center (24-hour Emergency Line): 734-936-3333

University of Michigan Police Department (UMPD) (24-hour): 734-763-1131

Counseling and Psychological Services (CAPS) – Counselor on Duty/Urgent (24-hour): 734-764-8312

Dean of Students: 734-764-7420

If you are concerned about a fellow student, you can submit a "Concern Report" to the College of Engineering and they will reach out to the student <https://care.engin.umich.edu/>. This can be anonymous. Someone from the CARE Office will reach out to the student. They may perform a welfare check if necessary.

Wolverine Wellness – is the part of UHS that fosters personal & community well-being for U-M students, in college and beyond: <https://www.uhs.umich.edu/wolverine-wellness>

UHS – for non-urgent health concerns: 734-764-8320

COVID-19 Resources for Rackham Graduate Students:
<https://rackham.umich.edu/covid-19/>

Other resources:

Free Groceries <https://mbc.studentlife.umich.edu/>

Better Sleep <https://www.uhs.umich.edu/sleep>

Wellness Coaching <https://www.uhs.umich.edu/wellness-coaching>

The Graduate Student Instructor Oral English Test (GSI OET) is a procedure for testing the spoken English of prospective graduate student instructors whose undergraduate education was at an institution in which the language of instruction is not English. The evaluation procedure is a performance test that consists of four tasks that assess a test taker's competence and effectiveness in the type of communication typically used by GSIs at the University of Michigan.

The test evaluates proficiency at the high intermediate to advanced level. The tasks and evaluation criteria of the GSI OET also serve as diagnostic tools to identify linguistic strengths and weaknesses of a test taker. A rating of B or higher is required to be approved for an appointment as a GSI.

Test Format

The GSI OET is semi-structured, face-to-face, involves one test taker and 2-3 evaluators (senior, junior, and optional faculty). It contains four scored tasks (Warm-Up, Lesson Presentation, Office-Hour Role Play, Video Questions). The test lasts 14-15 minutes, and is audiotaped for quality assurance purposes.

Rating Guidelines

Evaluators rate test takers in real time. During the test, each evaluator writes comments based on the evaluation criteria (PDF). At the end of the test, the test taker leaves the room and each evaluator independently rates the prospective GSI using the holistic rating scale (PDF). Evaluators then discuss the linguistic strengths and weaknesses of the test taker to reach a final rating.

Recently, the scores have changed from numeric to alpha scores; however, the English language proficiency required to pass the test has not changed. The table below will help compare the old scores with the new scores.

GSI OET Scores pre-2013	GSI OET Scores as of 2013	Eligible to teach?
5	A (high pass)	Yes
4+	A (high pass)	Yes
4	B (pass)	Yes
4-	C (fail)	No
3+	D (fail)	No
3	D (fail)	No
3-	D (fail)	No

A single, final rating is given.

A test report is sent to departments within 48 hours of test administration.

GSRA/GSI INFORMATION

A Graduate Student Research Assistantship (GSRA) is an appointment which is provided to a student in good standing in a University of Michigan graduate degree program who performs personal research (including thesis or dissertation preparation) or who assists others performing research that is relevant to his or her academic goals.

Graduate Student Instructors (GSIs) are generally in charge of teaching small introductory classes, facilitating discussions in small sections connected to large lecture courses, running laboratory sections, and holding office hours where one-to-one teaching occurs. Your responsibilities frequently include grading and giving feedback on students' written work as well.

Eligibility Requirements

- You must be in good standing in a graduate degree program
- You must be registered for the entire term you are appointed as a GSRA for at least 6 credit hours during the fall or winter terms. No registration is required for a spring/summer appointment.
- If you withdraw from the university after the drop/add deadline, or your appointment is terminated before the end of the term, you will become responsible for the full tuition and fees for that term.
- Please refer to the Office of the Registrar's Academic Calendar website for registration deadlines: <http://www.umich.edu/~regoff/calendar/>

Period Of Appointment

- GSRA/GSI appointments will typically be made for periods coinciding with academic terms.
- Your appointment for the term would not normally be reduced unless you fail to meet the enrollment requirements, or if it is determined that you are not making satisfactory progress toward your degree.

Grant or Contract Support (GSRA only)

- A stipend, which is made available as a result of an externally funded grant or contract, may be contingent on continuation of that grant or contract and must be subject to all of its terms. You will be notified in the event that external sponsor support is reduced or terminated resulting in an impact on the funding of a Graduate Student Research Assistantship. In such cases, every effort should be made to maintain an equivalent amount of financial aid from other sources for not less than the stated period of appointment.

Effort, Hours and Certification

- You will be expected to work an average of 10 hours per week if you have a 25% appointment and 20 hours per week for a 50% appointment.
- Where GSRA activity is funded by external sponsors, it is particularly important to ensure that effort during the appointment periods is not less than indicated on the appointment.
- You will be required to certify your work effort at the end of each term if your funding is from an external sponsored grant.

Course Size Policy (GSI only)

- GSIs are offered if course enrollment has 50 or more students.
- If a course is close to 50 but slightly lower, a request for assessment can be made by the faculty instructor to the chair of the department, who can then approve a GSI for a course with less than 50 students.
- GSI discussion sections are targeted for enrollment of no more than 32 students.
 - a. Generally, discussion sections are assigned for 25-28 students.
 - b. If enrollment exceeds the desired range, the department will begin assessing opening an additional section.
 - c. If an additional section is opened, the department will review balancing enrollment across the available sections. There is no guarantee for balancing section enrollment as it involves requesting registered students to choose to change sections.

Benefits

- If your appointment effort is 25% or greater, you are eligible for Grad Care health insurance.
- The Benefits Office will mail you an enrollment packet once your appointment is processed. It is your responsibility to sign up for benefits, using Wolverine Access, Student business.
- You have 30 days from the time your appointment was processed to enroll in benefits.
- If you choose not to elect any benefits, you must waive your coverage for the term and mail or fax it back to the Benefits Office.
- Funding changes from GSRA/GSI to fellowship support will affect your benefits. See Renee if your status changes.

GSRA/GSI INFORMATION (CONT'D)

Stipends

Your stipend will be paid to you on the last working day of each month in the term you are appointed.

Desks, Office Space, Keys and Mailboxes

- GSRA's and GSIs are assigned desk space on the 2nd floor of Dow in the Graduate Student office area. Please see Keith McIntyre in Rm. 2231A Dow for your desk assignment.
- Keith also issues keys to labs and offices.
- You will be issued a mailbox in room 3074 Dow during the term(s) you are appointed. Please check it regularly.

If you have any questions, please contact program advisor Renee Hilgendorf at reneeh@umich.edu.

LIBRARY RESOURCES

Library Resources in Your Subject Area:

If you are looking for resources for your subject area, check out the Engineering Research Guide (<http://guides.lib.umich.edu/Engineering>.) There you will find information about databases, reference books, and links to guides for the different engineering disciplines. In addition to subject research guides, you can also find guides on special topics like, Data Management Plans <http://guides.lib.umich.edu/engin-dmp>, Citation Management <http://guides.lib.umich.edu/citationmanagementoptions>, and Research Funding and Grants Guide <http://guides.lib.umich.edu/researchfunding>.

Library Databases and Online Resources:

Search for a database or an online resource in the library webpage search box at <http://www.lib.umich.edu> or in Search Tools at <http://www.lib.umich.edu/searchtools>. The Engineering Librarians recommend Engineering Village at <http://www.lib.umich.edu/database/link/8551> which covers Compendex and INSPEC and is an important database for all areas of Engineering.

Proxy Server Bookmarklet:

If you are off-campus or on wireless on campus and you do not get access to a resource that the library subscribes to, try reloading the page using the Proxy Server Bookmarklet. Instructions to install the bookmarklet can be found at <http://www.lib.umich.edu/mlibrary-labs/proxy-server-bookmarklet>.

Questions About Library Resources and Services:

Please contact your liaison librarian:

Leena Lalwani (llalwani@umich.edu) 734-936-2332

Policy for academic progress, unsatisfactory academic standing, and academic probation and dismissal from doctoral programs, approved by the MSE PhD Committee, November 13, 2018.

4.7 Deficiencies in academic progress of doctoral students

Students should periodically meet with their advisers to discuss their academic performance and progress toward the degree. Graduate programs should immediately notify students in writing when their performance falls below an acceptable level. In response to a student's academic deficiencies, the Graduate School may take any of the following actions:

- place a note of "unsatisfactory academic standing" on the student's academic record
- place a continuing student on academic probation;
- require a student to withdraw from the University; or
- not confer a degree or certificate.

4.7.1 Unsatisfactory academic standing

The Graduate School will place a notation of "unsatisfactory academic standing" on the academic record at the end of the term in which a student's cumulative GPA falls below a B (3.0 on a 4.0 point scale). The program will notify Rackham OARD when it determines that a student's performance is unsatisfactory. The program may decide whether unsatisfactory academic standing may be a basis for placing a student on academic probation (section 4.7.2).

A student with unsatisfactory academic standing may not advance to candidacy and will not be awarded a degree or graduate certificate, and may change programs and transfer credits only with permission of the admitting program.

4.7.2 Academic probation and dismissal of doctoral students for academic reasons

Academic probation is normally required before a program may recommend that a doctoral student be dismissed for academic reasons. As an exception, and only with advance notice to students, program policy may allow dismissal without probation for a student who fails to pass candidacy or preliminary exams.

As of the 2019 Winter Term, MSE will implement program-level policy for academic probation and dismissal that is consistent with the following guidelines. MSE is responsible for communicating this policy to all doctoral students and faculty and for applying this with equity and fairness, taking into account accommodations for disabilities. Academic probation will be noted on the student transcript.

Placing a student on academic probation. The advisor or graduate chair or director may recommend that a student be placed on academic probation. The decision to place a student on probation must be made by a faculty group of at least three persons to include, for example, the department chair (or the chair's designee), the graduate chair, and the advisor; the graduate committee of the program; or another committee constituted of faculty.

Length of the probationary period. The probationary period may be no shorter than two months of the fall or winter term and ordinarily conclude at the end of that term. For a student placed on probation within two months of the end of the fall term, the probationary period will extend into the winter term for a total of at least two months. For a student placed on probation within two months of the end of the winter term, the probationary period may include the spring or summer half-terms or the following fall term, for a total of at least two months. A student may be placed on probation starting in the spring or summer half term for a minimum of two months, and does not need to be enrolled during these half terms.

Notifications. The graduate chair must notify the student and Rackham OARD in writing before the probationary period begins, explaining the reasons and conditions of probation; the start and end dates of the probationary period; funding support (see below); conditions, if any, for returning to satisfactory standing; and options for appeal (see below). A student who has been placed on probation may request a leave of absence from Rackham or withdraw (sections 2.2.2,

2.2.3). The leave or withdrawal will stop the clock on the probationary period, which resumes when the student returns to active status or is reinstated. Probation will remain in effect until the conditions are remedied or the student is dismissed.

Funding a student on probation. The level of funding prior to probation should be continued through the probationary period.

End of the probationary period and dismissal. At the end of probation, and upon the recommendation of the graduate chair and the consent of the Graduate School, a student may either be returned to good academic standing or dismissed from the program. The decision to dismiss a student must be made by a faculty group of at least three persons to include the department chair (or the chair's designee), the graduate chair, and the advisor. The graduate chair must notify Rackham OARD of a recommendation for dismissal.

Option to appeal academic probation or dismissal. Students must be notified of options to appeal academic probation or dismissal. Appeals will be reviewed by a separate committee of three faculty on the graduate committee. Students may use Graduate School's Academic Dispute Resolution process only for procedural issues of fair and equal treatment under the policy of the program, and not to appeal the academic reasons for the decision.

Students who fail to meet standards of academic or professional integrity or who have been found responsible for violations of other University standards of conduct may be dismissed in accordance with separate procedures described in Rackham Academic and Professional Integrity Policy (section 11).

APPENDIX A: Rights and Responsibilities of Graduate Students

Adopted, September 1994

Preamble

The list of rights and responsibilities, which follows, is an outgrowth of discussions between individual graduate students and faculty of the Department of Materials Science and Engineering. The primary intent of producing such a list is to make both graduate students and faculty aware of their individual and collective responsibilities as they interact on a day-to-day basis. In addition, it was created to make new students aware of their rights within the framework of MSE and the procedures available to guarantee that fellow students and faculty do not ignore those rights. This is not intended as a legal document which supersedes standard university practice but, rather, as an expression of what many would consider to be common sense guidelines for effective interaction between students and faculty. Our goal is to foster an atmosphere of mutual respect and collective productivity within MSE.

I. Research Performance Evaluation

Right: The student has the right to expect his/her progress to be evaluated by an advisor. Evaluation should include mutual discussion of the work to be performed and suggestions as to methods, explanation of grading criteria for research credit hours prior to the semester, discussion of gradeable work during the semester, and explanation of the grade after the semester.

To ensure that this right is upheld: The student has the right to a written warning that the work performance is not acceptable at least two months before any action is taken, and has the right to a one-month written notice before project funding is withheld. Copies of these notices must be sent to the chairman of the Graduate Committee. If a student is dismissed during a semester for which they are enrolled, the advisor will be responsible for outstanding financial obligations such as tuition and associated fees, medical benefits, etc., until the end of that semester.

In rare circumstances a student will, with impunity, cease to discharge in any meaningful way the research responsibilities he/she assumed with the acceptance of a research assistantship. Examples of such behavior include failure to attend research group meetings, withholding of research data from the advisor, and refusal to perform required research. If such circumstances arise, the faculty reserves the right to review these cases and to determine if further support is warranted.

Responsibility: The student has the responsibility to perform to the best of his/her ability on the work suggested by the advisor. The student has the responsibility to hold research as confidential if this is deemed necessary by the advisor. The student has the right and responsibility to ask questions regarding the work if the intent and methods are not clear.

To ensure that this responsibility is upheld: The student has the responsibility to make regular reports as required by the advisor. A suggested format for reporting is a written summary and oral discussion at least once a month. A student intending to terminate employment or change advisors has the responsibility to provide the advisor with a written notice of intent to quit at least one month before terminating work on the project. After this month, the advisor will no longer be responsible for the student's financial support. During the final month, the student must prepare a written summary of the work performed and assist the advisor in bringing about a smooth transition.

If, during the course of the research, it becomes clear that the student will not be successful, it is the responsibility of the faculty to advise the student to pursue other options.

II. Academic Advisor and Thesis

Right: The student has a right to an advisor. The student has the right to the advisor's assistance in defining a thesis and planning a schedule for accomplishing the necessary research. The student has the right to establish an informal committee before becoming a candidate, for the purposes of guiding and critiquing the research.

Responsibility: All students are required to select a principle advisor as soon as possible, during the first semester of enrollment.

The Ph.D. student is required to establish a thesis committee within 6 months after achieving candidacy. MSE places considerable emphasis on the Dissertation Committee and each student will be advised to form their committee as soon as possible after achieving candidacy and certainly not longer than 6 months after candidacy. At this time the student shall convene a meeting of this committee and shall present a thesis proposal including purpose of the research, experimental methods, scientific and technological importance, and timetable for completion. The student should obtain approval of this proposal from the committee within one year of achieving candidacy. The student must convene meetings of the thesis committee to discuss progress at least every six months.

III. Grievances

Right: The student has the right to bring any grievance about the behavior of another student, staff or faculty member to the graduate committee or the chairman of the department. This includes grievances over grading, candidacy, work assignments, harassment, personal behavior, etc. The student has the right to be at the hearing of his/her grievance, and the right to privacy in the handling of the grievance. If the grievance cannot be solved within the department or the student is not comfortable airing the grievance, the student is encouraged to take applicable grievances to the Rackham grievance committee (see Rackham Student Handbook for guidelines).

Responsibility: The student has the responsibility to follow guidelines for personal and academic conduct as described in the Rackham Student Handbook and departmental booklet. Students are encouraged to speak out about any problems or concerns observed within the department. The student has the responsibility to present the concern clearly to the object of the grievance, and to hear the side of the other party both in private and before the graduate committee if necessary. The student has the responsibility to hold as confidential any information disseminated by the graduate committee in solving his/her grievance.

IV. Equipment Safety and Operation

Right: The student has the right to be trained in the use of departmental equipment necessary for the research by a faculty member or other skilled operator, and to have all safety precautions regarding the equipment explained.

Responsibility: The student has the responsibility to not make unreasonable demands for instant service by the faculty, and staff, to treat the equipment with care and according to instructions, and to follow all safety precautions. The student has the responsibility to ask if any aspect of operating the equipment is not understood, and to return the equipment to its proper place after use. The student has the responsibility to keep work areas and equipment clean and orderly.

To ensure that this responsibility is upheld: The right to operate equipment may be revoked if these responsibilities are not followed.

V. Class Selection

Right: The student has the right to select classes according to his/her own goals and needs, and submit that class selection to the advisor for discussion. A mutually acceptable selection should be agreed upon by the student and the advisor.

Responsibility: The student has the responsibility to discuss class selections with the advisor, consider the advisor's suggestions on class selection, and plan a course distribution that will meet departmental and Rackham course requirements.

II. Student Representation on Graduate Committee

Right: The graduate student body has the right to elect (two) active members to the Graduate Committee. The Graduate Committee will set aside portions of regular meeting time to include discussions with student representatives. It should be recognized that the faculty and the Graduate Committee reserve the right to hold faculty-only meetings where confidentiality is a concern.

Responsibility: Student members of the graduate committee have the responsibility to relate student opinion to the committee and disseminate committee information to the graduate student body. The student members also have the responsibility to hold as confidential any information from the committee, which is not for general knowledge.

APPENDIX B: Honor Code Policies

University of Michigan College of Engineering

We would like to review for you the policies of the Honor Code of the College of Engineering. It has come to our attention that there is a lack of understanding among faculty and students about the Honor Code, and the procedures to be followed in implementing it. We will attempt to detail some of these problem areas.

RIGHTS & RESPONSIBILITIES OF THE INSTRUCTOR:

1. This is the new Honor Pledge, an extension of that which appears in the Honor Code pamphlet:
"I have neither given nor received aid on this examination, nor have I concealed any violation of the Honor Code."
2. If you ask your students to write and sign the Honor Pledge on any work submitted for grading, you are not obligated to grade the student who fails to do so.
3. You must arrange alternate seating during exams and quizzes whenever possible. You should reserve an overflow room if necessary.
4. You may choose to remain in the examination room to answer questions. However, you must leave if a student asks you to.
5. Please make explicit, in writing, how much (if any) cooperation is permitted among your students on any work submitted for grading. This includes homework, lab reports, papers, projects, and other assignments.
6. If you observe—or even suspect—a violation of the Honor Code or its policies at any time, you must report it promptly to the Honor Council, Attn: Susan Burke, 1240A LEC Building (Zip 2102).
7. All decisions on penalty should be relegated to the Honor Council and the Faculty Committee on Discipline. This relieves you of any involvement in this aspect of a case.
8. You are encouraged to appear at the Faculty Committee hearing of a suspected student or students.

RIGHTS & RESPONSIBILITIES OF THE STUDENT:

1. You must write and sign the Honor Pledge on examinations: "I have neither given nor received aid on this examination, nor have I concealed any violations of the Honor Code." Instructors are not obligated to grade the exams of students who fail to write and sign the Honor Pledge.
2. You have the right to take examinations without any proctors.
3. You must write and sign the Honor Pledge on any other work if your instructor asks you to. Instructors are not obligated to grade the work of students who fail to write and sign the Honor Pledge when asked to do so.
4. You have the right to adequate seating during examinations whenever possible. If alternate seats cannot be left empty, you may request an overflow room.

PROCEDURE FOR SUBMITTING A SUSPECTED VIOLATION

1. Submit a written statement, signed by you, with the originals of any documents involved and the names of other individuals involved to the Honor Council, Attn: Susan Burke, 1240A LEC 2102. Mark all correspondence CONFIDENTIAL. Retain copies of all documents.
2. An investigator, appointed by the Honor Council, will contact you for an interview and for information pertaining to the case. We encourage faculty members to be present for the Council hearing to answer questions and clarify details.

The Honor Code has been a tradition of the College of Engineering since 1915. Its success and the respect it has gained is largely attributable to the cooperation of the faculty and students in their joint effort to stress the importance of building character and establishing personal integrity. We who serve on the Honor Council would like to maintain this tradition at Michigan, and would appreciate your help in doing so. We welcome comments and suggestions which can be sent to the Honor Council, Attn: Susan Burke, 1240A LEC Building 2102 by campus mail

—The Honor Council of the College of Engineering

APPENDIX C

The College of Engineering Honor Code

WHAT DOES THE HONOR CODE MEAN?

The Honor code is intended to support and enforce course policies in the College of Engineering. Course instructors have exceptional latitude when preparing the policies for their courses. This can lead to variations between policies of different courses. It is the instructor's responsibility to craft the course policies in accordance with the doctrine of the Honor Code.

Students are responsible for understanding the Honor Code and its implementation in the College of Engineering. Because the specific policies of different faculty members can vary significantly, it is the responsibility of faculty members to specify their policies in writing at the beginning of each semester. Students are responsible for understanding these policies and should consult the instructor if they are unclear. The Honor Code supports the individual course policy, whatever it may be.

If a student feels that his/her instructor is not doing what the Honor Code calls for, the student should contact the instructor or a member of the Honor Council to discuss this, and consider further steps, if needed.

Students of the College of Engineering enrolled in courses offered by other colleges must abide by the policies of the school or college in which the course is offered. Any suspected policy violations will be referred to the appropriate authorities of the school in question.

Students who are not members of the College of Engineering and who take a course offered by the College are bound by the policies of the Engineering Honor Code. Any suspected policy violations will be referred to the Engineering Honor Council and Faculty Committee on Discipline. The appropriate authorities of the school or college of the students involved will be notified.

WHEN TAKING AN EXAMINATION

The Honor Code holds that students are honorable and trustworthy people and encourages them to behave with integrity in all phases of university life. During examinations, the instructor is available for questions, but the examination is not proctored.

The instructor will announce the time and place of the examination. At the start of the examination, the instructor's whereabouts during the exam will be communicated to the class in case a question arises.

Students have the right to at least one empty seat between themselves and their neighbors. This helps ensure comfort during the examination and reduces the temptation to cheat. It is the instructor's responsibility to ensure that there is adequate seating beforehand, and to obtain additional rooms if necessary.

During the examination, students are free to leave the room. Minimal essential conversation is allowed. However, no communication regarding the examination is allowed inside or outside the room. All questions about the examination should be directed to the instructor.

After each examination, students must write the Honor Pledge in their test books and sign their names under it. The Honor Pledge is as follows:

"I have neither given nor received unauthorized aid on this examination, nor have I concealed any violations of the Honor Code."

Instructors are not required to grade tests in which the signed Honor Pledge does not appear. The Honor Code remains enforced whether or not the student signs the Pledge.

Students of the College of Engineering enrolled in courses offered by other colleges must abide by the policies of the school or college in which the course is offered. Any suspected policy violations will be referred to the appropriate authorities of the school in question.

USE OF COMPUTERS AND OTHER FACILITIES

Each department in the College of Engineering establishes its own general policies on the use of computers, laboratories, and other facilities. Students should observe any specific instructions appearing in computer rooms, laboratories, or libraries.

Students may not submit as their own work a computer program or part thereof which is not the result of their own thought and efforts. Contributions to a program from external sources must be acknowledged and properly documented in accordance with the course policies.

Students may not attempt to access or tamper with the class account of another student unless permission to do so has been given by both the class instructor and the student to whom the account is assigned.

Computers available for students to use are the property of the University of Michigan. Software available for students to use is the property of the University of Michigan or is licensed to the University of Michigan. Any unauthorized attempt to copy software or to tamper with computers or software is a violation of federal law, as well as the Honor Code.

All laboratories, classrooms, office equipment, and libraries are meant for instruction and learning. Misuse of these facilities is a violation of the Honor Code.

HOMEWORK AND LABORATORY ASSIGNMENTS

The principles of the Honor Code apply to homework and laboratory assignments as well as to examinations. The instructor may allow collaboration among students on such assignments. The instructor is to make clear how much, if any, collaboration is permissible. The instructor may also require that students write and sign the Honor Pledge on their homework and lab reports.

It is a violation of the Honor Code for students to submit, as their own, work that is not the result of their own labor and thoughts. Work which includes material derived in any way from the efforts of another author, either by direct quotation or paraphrasing, should be fully and properly documented. To avoid plagiarism, it is necessary to cite all sources of both ideas and direct quotations, including those found on the internet. The basic principle is to provide enough information so that the original source of material can be located. The University of Michigan English Department web site provides a thorough discussion of plagiarism.

UNIVERSITY DOCUMENTS

Official academic forms and records are the property of the College of Engineering and/or the University of Michigan. Tampering, alteration, or other misuse of these documents is a violation of the Honor Code, as is submitting falsified or altered documents.

COURSE REGISTRATION

The University Registrar's Office provides students with a registration date in accordance with their own policies. Registering for a course, in order to hold a seat for yourself or someone else is a violation of the Honor Code.

<http://ossa.engin.umich.edu/honor-council/policies-and-interpretations/>

APPENDIX D: Standard Format for the Ph.D. Dissertation Defense in MSE

The procedure to be followed for the “public” portion of the dissertation defense is designed to allow the Ph.D. Candidate, who, by then, has spent considerable time and effort in his research endeavors, to present the major findings of his research in the form of a seminar or invited talk.

The format is designed to allow friends and colleagues of the candidate to hear this seminar and ask questions without being required to sit through the entire defense. All MSE dissertation defenses should follow this standard format:

1. Public notices of the dissertation defense should be in place several days prior to the defense. Renee will prepare your postings – provide her with the following information: dissertation title, advisor and/or co-advisor, date, time, location
2. Opening remarks by the committee chairperson who introduces the candidate and explains the format of the proceedings.
3. Brief biography presented by the candidate.
4. Candidate’s talk; a 30 – 40 minute presentation of your work.
5. Questions/discussion by the general audience for a time not exceeding 15 minutes.
6. Members of the general audience are given the opportunity to leave, but are invited to stay.
7. In-depth examination of the candidate by the committee.
8. Private discussions by the committee.

APPENDIX E: Master’s Degree/Diploma Application Deadlines

Please see Rackham’s website for future deadlines:

http://www.rackham.umich.edu/help/graduating/masters_degree_diploma_application_deadlines/

Master’s Degree Diploma Application Deadlines

Students must apply to graduate in order to have the degree awarded. The deadlines for the conferrals are listed below:

APPENDIX F: Doctoral Degree Deadlines

Please see Rackham’s website for deadlines: http://www.rackham.umich.edu/help/graduating/doctoral_degree_deadlines/

Deadlines: All requirements must be complete, final, and approved by Rackham, no later than 5:00 pm Eastern Time on the deadline day.

Notes

1. A doctoral student must be enrolled for eight hours of candidacy during the full term in which s/he defends. It is expected that the defense will occur prior to the last day of classes for the intended final term of enrollment.
2. Degrees are conferred by the University of Michigan board of Regents three times a year. You may participate in commencement on or after the conferral date when all requirements have been completed.
3. This is a firm deadline and extensions will not be considered. The majority of students require a minimum of two weeks to make revisions and complete all requirements.
4. This is a firm deadline and extensions will not be considered. The majority of students require a minimum of two weeks to make revisions and complete all requirements. Additional term(s) of registration will be necessary if requirements are not met by this date.

APPENDIX G: Ph.D. Candidacy Deadlines

Please see Rackham's website for deadlines: http://www.rackham.umich.edu/help/graduating/candidacy_deadlines/

A student must be enrolled or otherwise be eligible for campus privileges, for a minimum of one credit, during the term in which preliminary exams are taken. Please see the Rackham Graduate School Academic Policies section 5.1 Candidacy Requirements for more information. Keep in mind prelims taken in the Fall or Winter term (for a student being advanced to candidacy in that term) will be assessed 8 hours of 995 for that term. Students registered full-time (8 hours, or 6 if a GSI, GSSA, or GSRA) during the previous Fall and Winter terms have through the end of May to complete the preliminary examination without registering for the spring or spring/summer term.

Recommendation for Candidacy

A doctoral student may be advanced to candidacy by the graduate school upon recommendation of the student's department. Advancement to candidacy will be granted when it is determined that the student has completed all requirements for the doctoral degree except the dissertation, and been approved for subsequent dissertation work. To recommend a doctoral student for candidacy the graduate coordinator must submit the recommendation through the online system at <https://secure.rackham.umich.edu/OARD/atc/>.

Advancement to Candidacy

When candidacy is approved, the Registrar's staff will change all 990 enrollments to 995 for the student.

Tuition will then be reassessed at the candidacy rate; only 990 registrations will be changed to 995; other courses would require an official drop/add form initiated by the student if changes are needed.

APPENDIX H: Web Registration

Registering for Classes

To register for classes, you need:

- Access to the web
- A username and password
- A list of courses that you would like to take.
 - Refer to the UM Schedule of Classes <http://www.umich.edu/~regoff/timesched/> for a list of classes offered.
 - Remember to identify any alternate courses that you might want to take in case your first choices are not available.
 - Log in to Wolverine Access to find out which courses are open, waitlisted, or have entry restrictions, and find out which courses require two or more sections.
 - Keep track of the classes you want to take via one of these methods:
 1. Log in to Wolverine Access and add them to your Pre-Registration Backpack; or
 2. Fill out a worksheet and weekly planner to help you with your registration. Write down the class numbers (e.g., 19433) for the class sections that you would like to add.
- A registration appointment start date and time. Note: To view your appointment, go to the Wolverine Access web site, select Student Business and log in with your username and password, Next, click View Enrollment Appointment and then select the appropriate Term and Academic Career. After your appointment, you may register anytime during Wolverine Access business hours.
- Electronic permission, if instructor or department permission is required or the class/section has entry restrictions, etc.

Can I register at any time?

You may register within Wolverine Access business hours anytime after your official registration appointment start time. The system will not allow you to register prior to your appointment. Note: After the first day of classes, you do not need an appointment to register.

ACADEMIC INFORMATION

What is the difference between a class number and a catalog number? A class number is a unique identifying number that is assigned to each class and specific to each term. Class numbers appear in the UM Schedule of Classes and are the numbers that you use to register for classes. A class number may be up to five digits.

A catalog number is the number that identifies a course within a subject. For example, in the case of "Math 115," the catalog number is "115". You do not use the catalog number when actually registering for classes. However, you may use the catalog number in conjunction with a subject code to search for information on a class.

How do I find out if a class has a prerequisite? View the information in Wolverine Access or your school bulletin, or, contact your advisor, department, or school or college.

How do I find out if a class is open or closed? There are two ways to find out if a class is open or closed. One way is to select Student Business from the Wolverine Access home page and log in with your username and password. Then click Backpack/Registration and select the appropriate Term and Academic Career.

- If the class is already in your Pre-Registration Backpack, the Class Status column indicates whether the class is Open or Closed.
- If the class is not already in your Pre-Registration Backpack, locate it by entering the class number or performing a class search using the Find Classes section at the top of the page. The system displays the class status (Open or Closed) in the Status fields on the Class Search Results and Class Enrollment Options pages.

The second way is to click [Class Search](#) on the Student Business home page, then enter the appropriate Term and click the Search button. Locate the class by entering the class number or performing a class search. The system displays the class status (Open or Closed) in the Status field on the Class Search Results page.

How do I find out if a class has seats reserved for a specific group of students? Information about seats reserved for a specific group of students, including the number of reserved seats appears in a field called Open Seats Reserved for on the Class Enrollment Options page. This field does not display unless the class was set up with seats reserved for a specific group of students.

How do I waitlist a class? If a class is closed and has a waitlist available, the 'Add me to waitlist if this class is closed' checkbox appears as on the Class Enrollment Options page.

Can I register for two classes offered at the same time? Yes. You may register for two classes offered at the same time by checking the 'Time Conflict is okay' checkbox on the Class Enrollment Options page.

How do I take a class as pass/fail? If a class has an optional grading basis, like pass/fail, the Choose Grading Basis link appears on the Class Enrollment Options page.

How do I specify that I want to take a class to satisfy the Upper-Level Writing Requirement (ULWR)? The ULWR requirement is applied to specific class sections. Students who need to fulfill their ULWR requirement need to enroll in one of those specific sections.

How do I register for a class that requires special permission or consent? If a class requires consent, you need to go to the department or instructor to request permission. The department enters an electronic permission into the system that allows you to enroll in the class. Once the permission has been entered, you must register for the class just as you would any other class.

How do I register for classes that require more than one component, such as a lecture and discussion, that must be taken together? If a class has multiple required components, such as a lecture and discussion, the components will be linked in the system. When you add the primary component (designated with a checkmark icon on the Class Search Results page), the system will prompt you to select the required secondary component before it adds it to your backpack or enrolls you in the class. It does not allow you to enroll in one component without enrolling in the other component.

Some class components have automatic enrollment. A message displays at the top of the Class Enrollment Options page if a primary component has related auto-enrollment components. Details for the auto-enrollment components display at the bottom of the Class Enrollment Options page. You will be automatically enrolled in these class components when you enroll in the primary component.

How will I know that I'm actually enrolled in the classes that I selected? After clicking Register for Class, if your enrollment request was successful, Wolverine Access displays a message stating that "You have successfully registered for class xxxxx." In addition, after you register, click the View Printable Schedule link on the Backpack or Registration pages, or click View Class Schedule on the Student Business page and select the appropriate Term and Academic Career. The system displays all classes that are currently in your schedule, including those that you have waitlisted.

APPENDIX I: Rackham Graduate Student Research Grant

- The Rackham Graduate School is committed to excellence in graduate education. The Rackham Graduate Student Research Grant is designed to support Rackham graduate students who need assistance to carry out research that advances their progress toward their degree.
- The grant is intended to defray costs of conducting clearly defined research projects including:
- Research related expenses (e.g., subject fees, access to specialized data sets, purchase of archival materials or images, laboratory supplies that will be consumed in the course of the project)
- Temporary research assistants or transcribers (NOTE: Requests for this type of expense must include a compelling explanation of why the student cannot perform the work him or herself. Please see below for explanation.)
- Research-based travel not associated with a course (e.g., off-campus data collection, access to libraries, archives or historical sites)
- Purchasing laboratory equipment, field work equipment or computer software (NOTE: This type of expense has some special limitations. Please see below.)
- Off-campus study of foreign languages needed for research. Proposals will be considered only if the instruction is not available on the U-M Ann Arbor campus. The relevance of the language studied to the student's research must be explained in the proposal.
- Off-campus study of specialized methodologies or techniques needed for research. Proposals will be considered only if instruction in the methodologies and/or techniques is not available on the U-M Ann Arbor campus. (NOTE: An explicit paragraph explaining the relevance of the methodologies and/or techniques to the student's research must be included in the proposal.)
- MFA and DMA students in Dance, Art and Design and Music are eligible for this funding to support a performance or exhibition as required by their graduate program. The presentation or performance must be central to the student's graduate studies and serve to contribute directly to his or her degree.

Eligibility

Graduate students are eligible to apply for a Rackham Graduate Student Research Grant if:

- The graduate student is in good academic standing in a Rackham degree granting program
- The proposed research project or activity directly relates to and helps achieve progress towards his or her degree.

A master's student is eligible for one Rackham Graduate Student Research Grant during his or her graduate program. A doctoral student is eligible for two Rackham Graduate Student Research Grants during his or her graduate program, one before candidacy and one as a candidate. Students who receive a master's award will not be eligible as a pre-candidate.

Selection Criteria

Criteria for funding will include the clarity and coherence of the rationale for the project, the significance of the research question being addressed, the value of the project for the student's graduate school and career goals, the qualifications of the student to carry out the proposed research, and the relevance and reasonableness of the budget request for the activities proposed. Applications will be reviewed only after they have been submitted (online).

The student will receive an e-mail notifying him or her of Rackham's decision. If a grant is awarded, procedures for payment will be outlined in the e-mail.

Deadline

Awards are reviewed and accepted on an individual basis.

Award Description

- Master's students are eligible for an award up to \$1,500
- Pre-candidates are eligible for an award up to \$1,500
- Candidates are eligible for an award up to \$3,000

RACKHAM RESEARCH GRANTS

Application Procedures

Students must apply online at <https://secure.rackham.umich.edu/Funding/research/>

Students must submit a research proposal, budget and letter of support. The research proposal is limited to 1,500 words. References are not included in this word limit and may be submitted to flwships@umich.edu if they exceed the space limit on the application.

The dissertation chair, faculty advisor or graduate chair listed on the application may submit their letter of support online at [Apply now for a Rackham Graduate Student Research Grant](#)

Students should carefully review the Guidelines section on the online application. This section contains detailed information on submitting a proposal and budget as well as a list of ineligible expenses that should not be included in the application.

APPENDIX J: Rackham Conference Travel Grants - Provisions/Regulations

Rackham Conference Travel Grant

The Rackham Conference Travel Grant is intended to provide opportunities for Rackham graduate students to become familiar with, and participate in the life of, their academic professions. As part of its University-wide commitment to advancing international research and training, the International Institute provides funding for 30 awards to international destinations. The remainder of the funding comes from Rackham. You must submit your applications before the first day of the conference for travel through the end of the final term of registration. The conference may occur anytime up through your final semester of registration. Applications will not be considered for retroactive funding.

Eligibility

Graduate students are eligible to apply for a Rackham Conference Travel Grant award if:

- The graduate student is in good academic standing in a Rackham degree granting program.
- The student has responded to a formal call for abstracts.
- The student has been accepted to present a poster or paper at a conference.

Deadline

Ongoing. Complete applications, including the letter of recommendation, must be received before the first day of the conference.

Award Description

A student is eligible to receive one travel grant award (either domestic or international, but not both) during a fiscal year, which runs from July 1 - June 30, based on the start date of the conference.

- Up to \$700 for the continental US.
- Up to \$950 for Alaska, Hawaii, Puerto Rico, Canada, Mexico, the Caribbean, and Europe.
- Up to \$1,200 for Africa, Asia, South America, and Australia.

Application Procedure

Students may visit the Rackham Conference Travel Grant application and submit the following:

- Recommendation from the faculty advisor or graduate chair as to how the conference participation is directly relevant to the student's research or graduate studies.
- Copy of the confirmation of presentation (letter or e-mail is acceptable) with the applicant's name clearly listed as a presenter or performer to verify the student's acceptance to participate in the conference.
- A budget regarding the amount of funding requested and a list of the specific expenses covered by the award.



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