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REQUIREMENTS FOR THE MASTER OF SCIENCE
IN CHEMICAL ENGINEERING

1. BACKGROUND COURSES

Basic Sciences

All students who intend to follow a Master of Science degree program in chemical engineering should have acquired technical background in chemistry, mathematics and physics. Prior coursework should include at least include one full semester course in general chemistry, organic chemistry, physical chemistry, differential equations, and calculus-based Newtonian mechanics (physics). If such courses are absent from a student’s undergraduate curriculum, the student must upgrade his/her technical background to at least these minimum standards by taking the necessary courses. Background courses in chemistry, mathematics and physics cannot be included as part of the coursework requirement for an advanced degree in chemical engineering.

Chemical Engineering

The requisite background in chemical engineering is normally provided by a series of one semester courses in each of the following areas: fundamentals of transport processes, thermodynamics, separation processes and reactor design. These requirements are automatically satisfied by a BS degree in Chemical Engineering. Those graduate students who do not have an undergraduate degree in chemical engineering may satisfy these minimum engineering requirements by taking at least two additional courses in core areas offered by the department. These courses may all be included as part of the student’s advanced degree program as they are advanced in content, rigor and requirements. Master of Science students who do not have a baccalaureate degree in engineering should normally select all their courses from those offered by the School of Engineering and Applied Science.

2. MASTER OF SCIENCE DEGREE PROGRAMS

The faculty advisor and the Dean for Graduate Studies must approve all Master of Science programs by approving your Program of Study form. The Master of Science degree may be earned with or without writing a thesis; the general requirements for the degree are described in the University of Rochester’s Graduate Studies Bulletin. Graduate students have the option to complete the MS degree with a thesis (Plan A) or coursework-only non-thesis (Plan B). Full time students receiving a stipend must complete a thesis (Plan A) unless the research advisor and the Graduate Committee approve the Plan B program.
Master of Science with Thesis (Plan A)

The MS degree with thesis (Plan A) requires **30 credit hours** of which **at least 18 should be formal coursework** acceptable for graduate credit. The balance of credit hours required for the degree is earned through MS reading and/or research courses (ChE 495). Satisfactory completion of the Master’s thesis is also required for the degree.

Master of Science without Thesis (Plan B)

All students in Plan B must pass a thirty minute oral exit exam before a committee comprised of at least three Chemical Engineering faculty members. A written report is **not required**. Two weeks prior to the exam, the M.S. candidate will be provided three recently published papers, one of which he or she must choose to evaluate. Students are not allowed to discuss their chosen manuscript with other students or faculty. The exam begins with the candidate presenting a ten minute oral summary and critique of the chosen manuscript. The presentation should consist of projected slides (e.g. PowerPoint). Slides should introduce the chosen manuscript, demonstrate a solid understanding of relevant physical principles, and offer an evaluation / critique of the manuscript. The examination committee members will then ask questions for approximately twenty minutes to evaluate (i) the student's ability to identify and clearly explain the physical principles upon which the paper is based, (ii) the scientific basis and appropriateness of the student's critique, and (iii) student competency in chemical engineering subjects, particularly those related to completed M.S. coursework.

It is considered important that the total exam time (30 minutes for each student) be rigorously maintained. As a result, students are reminded that it is very important for them to use their time well during both the presentation and question portions of the exam. Students are encouraged to rehearse their presentations and will be stopped after ten minutes.

Following the exam, the committee will recommend to the Director of Graduate Studies that the student **pass**, **pass with contingency**, or **fail**.

Possible Outcomes:
- **pass**
- **contingent pass**: either take additional course(s) or write a follow-up document to be reviewed and voted on by the committee
- **failure**: can retake the exam the next time it is offered. Students who fail the exam twice are terminated from the program.

The oral exams will normally be held twice a year, after spring break and after fall break. Exams will normally be held in a single block, with students following each other at half-hour intervals.

All students who pursue the MS degree without thesis (Plan B) must earn a minimum of **32 credits of coursework acceptable for graduate** credit. **At least 18** of these credits should be taken from courses **within the department**. Overall **no more than 6 credits** towards the degree may be earned by research and/or reading courses. The additional courses in the Plan B
program (over Plan A) are intended to compensate for the elimination of a thesis as a degree requirement, and they must support a MS in chemical engineering even if offered outside of the department.

NOTE: For both the Plan A and B degree options, at least 12 of the 18 hours of formal course requirements must be at the 400 level or above and be courses taken from within the department. The formal courses must also include three “core” chemical engineering courses as described below.

Core Course Requirements

Students with prior chemical engineering background: The program for the M.S. degree should include at least one graduate level course from each of the following three core areas:

Transport Phenomena
    CHE 441 Advanced Transport Phenomenon (Fall)

Thermodynamics
    CHE 485 Thermodynamics and Statistical Mechanics (Spring)

Mathematics
    CHE 400 Applied Boundary Value Problems (Fall)

Students without prior chemical engineering background: The program for the M.S. degree should include at least two from the following three core areas and one of the 400 level courses listed above from a different area. The courses below were formerly valued at 3 credits each, but are now 4 credits, as they are advanced in content, rigor and requirements.

Transport Phenomena
    CHE 243 Fluid Dynamics (Spring)
    CHE 244 Heat and Mass Transfer (Fall)

Thermodynamics
    CHE 225 Chemical Engineering Thermodynamics (Fall)

Separations & Reactor Design
    CHE 231 Chemical Reactor Design (Spring)
    CHE 250 Separation Processes (Spring)

Master’s Student Expectations and Responsibilities

Find this information at:

http://www.rochester.edu/college/gradstudies/policies/masters.html
**UNIVERSITY OF ROCHESTER**  
**ARTS, SCIENCES AND ENGINEERING**

**PROGRAM OF STUDY FOR THE MASTER’S AND/OR PHD DEGREES**

**Name**  
Student With a ChE Background - EXAMPLE  
URID 12345678

**Program**  
Chemical Engineering  
(Find this fillable form at https://www.rochester.edu/asei/docs.php)

**Date**  
January, 2017 (Due to void this month or earlier)

**Plan**  
☑ Master’s  
☐ PhD

**Plan**  
Plan B

**INSTRUCTIONS:** This program of study must be prepared by the student in consultation with the department. Courses completed should include the grade earned in the course. Courses in progress should be marked with an asterisk (*). Courses taken at other institutions for transfer credit should be listed separately and an official supporting transcript attached, except that if a Master’s degree is presented for 30 hours transfer credit, the individual courses need not be listed.

<table>
<thead>
<tr>
<th>Subject/ Course #</th>
<th>Check if Master’s PoS</th>
<th>Grade (if completed)</th>
<th>Descriptive Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 441</td>
<td>x</td>
<td></td>
<td>Advanced Transport Phenomenon *</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 460</td>
<td>x</td>
<td></td>
<td>Solar Cells</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 400</td>
<td>x</td>
<td></td>
<td>Applied Boundary Value Problems *</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 496</td>
<td>x</td>
<td></td>
<td>Research Seminar</td>
<td>0.0</td>
</tr>
<tr>
<td>CHE 485</td>
<td>x</td>
<td></td>
<td>Thermodynamics and Statistical Mechanics *</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 413</td>
<td>x</td>
<td></td>
<td>Engineering of Soft Matter</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 489</td>
<td>x</td>
<td></td>
<td>Biosensors</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 496</td>
<td>x</td>
<td></td>
<td>Research Seminar</td>
<td>0.0</td>
</tr>
<tr>
<td>CHE 458</td>
<td>x</td>
<td></td>
<td>Electrochemical Engineering &amp; Fuel Cells</td>
<td>2.0</td>
</tr>
<tr>
<td>CHE 482</td>
<td>x</td>
<td></td>
<td>Processing Microelectronic Devices</td>
<td>2.0</td>
</tr>
<tr>
<td>CHE 495</td>
<td>x</td>
<td></td>
<td>Master’s Research in Chemical Engineering</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 496</td>
<td>x</td>
<td></td>
<td>Research Seminar</td>
<td>0.0</td>
</tr>
<tr>
<td>CHE 497</td>
<td>x</td>
<td></td>
<td>Teaching Chemical Engineering</td>
<td>0.0</td>
</tr>
</tbody>
</table>

* Core courses  

**Total Hours (at least 30 credit hours for Master’s and 90 credit hours for PhD):** 32 needed for Plan B

**Remarks**

18 formal credits must be within dept. 12/18 at advanced level. No more than 6 research cr for Plan B.

☐ Check here to verify that any 200/300 level courses on this Program of Study are advanced in content, rigor, and requirements.

**APPROVED, Faculty Advisor** ________________________  
**Date** ________________________

**APPROVED, Dean of Graduate Studies** ________________________  
**Date** ________________________

**DISTRIBUTION:**  
GSO Student File and Department

Rev 5/16
3. PROGRAM OF STUDY

A faculty advisor will generally be named for each student by the end of the first semester. The advisor assists the student in developing a complete program of study for the anticipated degree. Each program and all subsequent changes must be approved by the student’s advisor and the associate dean for graduate studies. Students who take courses without the approval of the advisor and the associate dean, or without registering for them, may not receive credit toward their degree requirements. Master’s degree programs must be filed no later than the date specified by the college.

4. RESEARCH SEMINAR REQUIREMENT

All students are required to register for the Chemical Engineering Departmental Seminar Series (CHE 496), unless they are in-absentia. The department chairperson should be indicated as the instructor for the course with zero credit hours. Grading for this course is based on attendance. Attendance at all the seminars is expected. Students may miss one seminar per semester and still receive a grade of “A”. Each additional seminar missed will lower the grade by one letter. The dates and times of the seminars are posted on the departmental web page and announced via e-mail.

5. EVALUATION: RESEARCH PROGRESS REVIEW (RPR)

In order to evaluate student’s research performance, all students pursuing a M.S. Plan A degree are required to submit the Research Progress Review (RPR) at the conclusion of every semester (Fall and Spring). At the same time, faculty advisors will inform the graduate studies committee of student’s research progress and include recommendations for the following semester. After all forms have been submitted to the Graduate Program Coordinator, the graduate committee will review students’ academic records and research accomplishments within the concluding semester. A full report will be submitted to the Graduate Studies Office.

6. TA REQUIREMENT

All graduate students are required to TA. TAs need to register for CHE 497, “Teaching Chemical Engineering” with zero credits. Satisfactory performance is expected in each TA assignment, and will be acknowledged on the academic transcript.

MS Degree Maximum Time of Completion*

A candidate must complete all the requirements for the master’s degree within five years from the time of initial registration for graduate study, and must maintain continuous enrollment for each term after matriculation. Students who for good reason have been unable to complete a program within five years may, upon recommendation by the faculty advisor and department chair, petition the associate dean for an extension of time. Such extension, if granted, will be of limited duration. * All categories including “Leave of Absence” count towards the time limit

REQUIREMENTS: THESIS PROPOSAL FOR MASTER’S FUNDING
Proposal Description:
The thesis proposal serves two primary purposes. First, it is the means by which the funding committee evaluates the merit of the research. The objective of the Master’s funding program is to support research experiences for our students wanting to pursue Plan A degrees, while seeding new research directions within the laboratories of departmental faculty. Our department emphasizes original, innovative, high impact research on important applied and scientific problems. The proposal should present your proposed approach to a problem or open question – demonstrating your technical acumen and convincing the committee of the likelihood of its success. Second, the proposal is used to judge your writing abilities. A Plan A Master’s degree requires that you conduct original research, and then prepare and defend a dissertation to be read and evaluated by a thesis committee. From UR’s Preparing Your Thesis manual (http://www.rochester.edu/Theses/ThesesManual.pdf), “At the University of Rochester, the doctoral [also master’s] thesis is expected to be an original work by the student, formulated in a scholarly manner and with content of a quality consistent with respected publications in your field.” This statement is not intended to dissuade you from pursuing a Plan A degree but rather emphasize the importance of strong writing skills required to produce a high quality, defendable thesis.

The thesis proposal should describe the research topic, impress the scientific interest or practical utility of the topic, review the current status in the field and previous results from your advisor’s laboratory, and describe your proposed approach to an important question or problem.

Proposal Instructions:
The proposal must be prepared solely by you. You are encouraged to seek assistance from friends and the UR Writing Center (writing.rochester.edu), but the text and ideas must be developed by you independently. Do not copy text from other sources, including materials that your perspective advisor might provide you.

The written reports should be no more than 1600 words in length (the cover page, figure captions, references, and budget justification are excluded from the word count). The report should contain enough information that an outside reviewer with a technical background but who is not an expert in the field can fully understand and critique it. The formatting and the technical content of the proposal is left to your discretion, but it should be a highly polished document written at a technical level. Feel free to discuss the content of the proposal with your advisor, but some examples and suggestions are provided below:

- **Introduction and Background:** Describe the research topic. Why is it important? What is its technological relevance or what fundamental property/phenomenon do you expect to uncover?

- **Previous work:** What has been achieved? What are recent breakthroughs? What contributions has your advisor’s lab made and how is your research distinct?
• **Proposed work**: Thoroughly describe your idea – specifically, what experiments do you intend to do. Justify your proposed approach.

• **Conclusion**: Briefly summarize the main points.

• **References**: *(required)*
  o Must be cited in the body of the text
  o Should come from high quality, reliable sources - often peer-reviewed publications and/or books
  o A consistent formatting of the references and in-text citations should follow the general practice of your discipline, but the ACS Style Guide is a good starting point: [http://pubs.acs.org/isbn/9780841239999](http://pubs.acs.org/isbn/9780841239999)

• **Figures** *(required)*
  o Should be embedded throughout main body of the text (not listed at the end)
  o At least some should be original figures that you have prepared (not reproduced from references)
  o If you do reproduce a figure, it should be cited appropriately.

• **Appendix, Budget Justification** *(limited to 1 page)*
  o Maximum allowable budget is $5000
  o With input from your PI, describe and justify the requested budget.
  o *A table categorizing the various expenses is an effective way to present the budget, but concise justification of each line is required.*
  o Examples of allowed costs: small equipment, chemicals, supplies & consumables, user facility instrument fees, conference registration fees, specialized software, etc.
  o Unallowed costs: salaries, equipment maintenance & service contracts, new computers & office equipment for your advisor’s group

**Document formatting** *(do not deviate)*

• 8-1/2 x 11” paper
• 1” margins on all sides
• Font: 11 pt., Times New Roman or Arial. Other fonts are not allowed.
• Plan ahead: Contact Vicki at least 4 weeks prior.
• Thesis must be registered at least 10 (? The number of days has fluctuated in recent semesters) full working days prior to defense date.
• All paper work must be completed BEFORE those 10 days.(See #1)
• Program of study must be completed.
• Student must have completed or will have completed 30 hours of study by the anticipated graduation day.
• Student coordinates committee members prior to thesis registration. Committee must consist of the following faculty members:
   Two full-time (assistant professor or higher) from within ChE˚
   One non-department full-time (assistant professor or higher)
   If non-department student advisor, need additional committee member from within ChE˚
• Student needs to contact Vicki to reserve Gavett 206, 208, or other
• Thesis registration:
   Examination Appointment Form must be completed
   One bound copy of the thesis must be registered with the Graduate Students Office (218 Lattimore) at least 10 working days prior to defense date along with Examination Appointment Form.
• Student needs to provide and deliver a copy of their thesis to each committee member. This is done the same day the thesis is registered.
• Student needs to provide Vicki with the abstract & title of their thesis. This is done the same day the thesis is registered
• Master’s defense guidelines:
   http://www.rochester.edu/college/gradstudies/masters-defense/before.html#writing-guidelines
    You may obtain a copy of the UR Theses Manual online:

After your defense and any corrections are made to the thesis, two final unbound copies are delivered to Grad Studies. One unbound copy and one on CD are provided to Vicki
http://www.rochester.edu/college/gradstudies/current/
COURSE REQUIREMENTS FOR THE DOCTOR OF PHILOSOPHY
IN CHEMICAL ENGINEERING

For the doctoral degree the University requires a total of 90 credit hours. In practice, most of these are research credits. Note that, during the first year of residence, students are typically asked to take a total of 32 credits. (To maintain the full-time student status, a minimum of 12 credits/semester should be taken.) In addition to research, it is required that entering students with an MS degree complete a minimum of 18 credit hours of formal coursework. Those students entering the Ph.D. program without an MS degree must complete a minimum of 30 credit hours of formal coursework. Of the formal coursework, three courses must satisfy the “core” fundamentals of Chemical Engineering as defined below.

1. CORE COURSE REQUIREMENTS

Students with prior chemical engineering background: The program for the Ph.D. degree should include at least one graduate level course from each of the following three core areas:

**Transport Phenomena**
- CHE 441  Advanced Transport Phenomenon (Fall)

**Thermodynamics**
- CHE 485  Thermodynamics and Statistical Mechanics (Spring)

**Mathematics**
- CHE 400  Applied Boundary Value Problems (Fall)

Students without prior chemical engineering background: The program for the Ph.D. degree should include at least two from the following three core areas at the undergraduate level and one of the graduate courses listed above from a different area. The courses below were formerly valued at 3 credits each, but are now 4 credits, as they are advanced in content, rigor and requirements.

**Fluid Dynamics**
- CHE 243 Fluid Dynamics (Spring)
- CHE 244 Heat and Mass Transfer (Fall)

**Thermodynamics**
- CHE 225 Chemical Engineering Thermodynamics (Fall)

**Separations & Reactor Design**
- CHE 231 Chemical Reactor Design (Spring)
- CHE 250 Separation Processes (Spring)
## UNIVERSITY OF ROCHESTER
ARTS, SCIENCES AND ENGINEERING

### PROGRAM OF STUDY FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

**Name**  
Student, Without ChE Background EXAMPLE

**URID**

**Program**  
Chemical Engineering

**FIND THIS FILLABLE FORM AT:**  
https://www.rochester.edu/asei/get_file.php?id=2312

**Date**

**INSTRUCTIONS:** This program of study must be prepared by the student in consultation with the department. Courses completed should include the grade earned in the course. Courses in progress should be marked with an asterisk (*). Courses taken at other institutions for transfer credit should be listed separately and an official supporting transcript attached, except that if a Master's degree is presented for 30 hours transfer credit, the individual courses need not be listed. See https://cdcs.ur.rochester.edu

<table>
<thead>
<tr>
<th>Subject/Course #</th>
<th>Grade (if completed)</th>
<th>Descriptive Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 441</td>
<td></td>
<td>ADVANCED TRANSPORT PHENOMENON</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 400</td>
<td></td>
<td>APPLIED BOUNDARY VALUE PROBLEMS</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 485</td>
<td></td>
<td>THERMODYNAMICS &amp; STATISTICAL MECHANICS</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 231</td>
<td></td>
<td>CHEMICAL REACTOR DESIGN REC</td>
<td>3.0</td>
</tr>
<tr>
<td>CHE 250</td>
<td></td>
<td>SEPARATION PROCESSES</td>
<td>3.0</td>
</tr>
<tr>
<td>CHE 460</td>
<td></td>
<td>SOLAR CELLS</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 488</td>
<td></td>
<td>INTRO TO ENERGY SYSTEMS</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 413</td>
<td></td>
<td>ENGINEERING OF SOFT MATTER</td>
<td>4.0</td>
</tr>
<tr>
<td>CHE 595</td>
<td></td>
<td>PHD RESEARCH IN CHEM ENGR</td>
<td>60.0</td>
</tr>
<tr>
<td>CHE 595</td>
<td></td>
<td>(At least twice for PhD student)</td>
<td>90.0</td>
</tr>
<tr>
<td>CHE 497</td>
<td></td>
<td>TEACHING CHEM ENGR (At least twice for PhD student)</td>
<td>0.0</td>
</tr>
<tr>
<td>CHE 496</td>
<td></td>
<td>RESEARCH SEMINAR (Every Semester)</td>
<td>0.0</td>
</tr>
<tr>
<td>CHE 997</td>
<td></td>
<td>DOCTORAL DISSERTATION (No fee, can be used once)</td>
<td>0.0</td>
</tr>
<tr>
<td>CHE 999</td>
<td></td>
<td>DOCTORAL DISSERTATION (Fee)</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Total Hours (the total should not equal less than 90 credit hours)**  
90.0

**Remarks**
Get Advisor's signature and give to Vicki. If this POS changes, please revise and note revision in top right corner.

**APPROVED, Faculty Advisor**

**Date**

**APPROVED, Dean of Graduate Studies**

**Date**

**DISTRIBUTION:**
GSO Student File and Department

Rev 2/14
2. PROGRAM OF STUDY (POS)
A faculty advisor will generally be named for each student by the end of the first year of study. The advisor assists the student in developing a complete program of study for the anticipated degree. Each program and all subsequent changes must be approved by the student’s advisor and the associate dean for graduate studies. Students who take courses without the approval of the advisor and the associate dean, or without registering for them, may not receive credit toward their degree requirements.

Ph.D. programs, approved by the department chair, program director, or their representative, should be filed with the associate dean for graduate studies no later than two years after initial registration as a matriculated student.

3. WAIVING THE CORE COURSE REQUIREMENTS
Students who have taken similar graduate courses elsewhere may in some instances be allowed to waive the core course requirements. Interested students must file a petition for accepting courses taken elsewhere in lieu of the recommended core courses to the Director of Graduate Studies and the Chair with research advisor’s endorsement. Waiving the core course requirements will not eliminate the requirement that students with MS degrees complete 18 credit hours of formal coursework as part of the Ph.D. program of study.

4. RESEARCH SEMINAR REQUIREMENT
All students are required to register for the Chemical Engineering Departmental Seminar Series (CHE 496), unless they are in-absentia. The department chairperson should be indicated as the instructor for the course with zero credit hours. Grading for this course is based on attendance. Attendance at all the seminars is expected. Students may miss one seminar per semester and still receive a grade of “A”. Each additional seminar missed will lower the grade by one letter. The dates and times of the seminars are posted on the departmental web page and announced via e-mail.

5. TA REQUIREMENT
All graduate students are required to TA. TAs need to register for CHE 497, “Teaching Chemical Engineering” with zero credits. Enter the Professor you are TA for as the instructor. Satisfactory performance is expected in each TA assignment, and will be acknowledged on the academic transcript.

6. EVALUATION: RESEARCH PROGRESS REVIEW (RPR)
In order to evaluate student’s research performance, all students pursuing a and Ph.D. degree are required to submit the Research Progress Review (RPR) at the conclusion of every semester (Fall and Spring). At the same time, faculty advisors will inform the graduate studies committee of student’s research progress and include recommendations for the following semester. After all forms have been submitted to the Graduate Program Coordinator, the graduate committee will review students’ academic records and research accomplishments within the concluding semester. A full report will be submitted to the Graduate Studies Office.

7. Ph.D. MAXIMUM TIME OF COMPLETION*
All work for the Ph.D. including the final oral examination must be completed within seven years from date of initial registration, except that a student who enters with a master’s degree or its equivalent for which the full 30 credit hours is accepted in the doctoral program must complete all work with six years from date of initial registration. Students who for good reasons have been unable to complete a program within the above stated limits may, upon recommendation by the faculty advisor and department chair, petition the associate dean for an extension of time. Such extension, if granted, will be of limited duration and must be reapproved at least annually. Requests for extension beyond 12 years must be approved by the University dean of graduate studies.

* All categories including “Leave of Absence” count towards the time limit

**Elective Courses in Chemical Engineering:**
CHE 213/413 Engineering of Soft Matter (Spring)
CHE 258/458 Electrochemical Engineering & Fuel Cells (2 cr.)(Fall)
CHE 282/482 Processing of Microelectronic Devices (2 cr.)(Fall)
CHE 414 Math Meth for Optics & Phy (Fall)
CHE 420 Biomedical Nanotech (Fall)
CHE 460 Solar Cells (Fall)
CHE 462 Cell & Tissue Engineering (Spring)
CHE 464 Biofuels (Fall)
CHE 465 Green Chemical Processes (Spring)
CHE 469 Biotechnology & Bioengineering (Spring)
CHE 486 Polymer Science & Engineering (Fall)
CHE 488 Introduction to Energy Systems (Fall)
CHE 489 Electrochemical Sensor Design (Spring)
CHE 492 Biointerfaces (Spring)
QUALIFYING EXAMINATIONS FOR THE PH.D DEGREE
IN CHEMICAL ENGINEERING

Philosophy

It is essential that the Ph.D. bound graduate student have a sound technical background and the creativity and judgment necessary to conduct independent research. In addition, it is critical that the student have demonstrated a breadth of knowledge of Chemical Engineering fundamentals before proceeding to specialized Ph.D. research. The purpose of the qualifying examination procedure is to assess these qualities in each student who desires admission to Ph.D. candidacy. The graduate student’s competence and promise are evaluated by his/her performance in graduate courses, by a critique of a recently published research article, on thesis research, and by an oral defense of a proposal for Ph.D. thesis research.

Selection of First Faculty Advisor

An incoming first-year student is assigned with a faculty advisor. This faculty member may or may not be the thesis advisor for the student. Students will attend faculty research presentations as scheduled (usually early to mid September). After the presentations, students will indicate their top three choices. Faculty and students will be matched based on research interests and openings.

Selection of Ph.D. Thesis Advisor

The students are required to formally declare their Ph.D. thesis advisors by submitting an email to the Graduate Program Coordinator before the end of January of their first year of residence. Students should discuss their research interests with the faculty members in the Department and receive prior endorsement from the faculty members that they intend to work with. Failure to declare a Ph.D. thesis advisor by the end of January in the first year will jeopardize your financial support.

The First-Year Examination

Every chemical engineering student interested in pursuing the Ph.D. degree must take the First-Year Examination. The examination is based upon the student’s critical evaluation of a recently published research article. The student must evaluate the paper in a written report and oral presentation. In particular, the student is asked to:

(a) identify the questions addressed by the author
(b) formulate a critical appraisal of the author’s approach and contribution
(c) propose research to extend and improve upon the study presented in the article.
After the last day of classes of the spring semester, the student is given three research articles for preview. Two days later, the student must indicate in a letter to the Graduate Committee which of these articles has been chosen to serve as the basis for the examination. Within ten days following selection of the article, the student must submit to the Graduate Program Coordinator an electronic file of a written document not longer than fifteen double-spaced typewritten pages plus appendices which contains three sections: Questions Addressed by the Author, Critical Appraisal of the Article, and Proposal for Additional Research. These are to address items (a), (b), and (c) above and should be specific and comprehensive within the length limit. The student should understand that there will be ample opportunity to elaborate on points raised in the document during the oral portion of the examination. On the day the document is submitted, it is distributed to members of the examination committee.

The papers given to the student will be assigned by the Graduate Committee from a pool of recently published (within the last three years) journal articles selected by faculty. The journal articles are selected for quality and the potential for wide ranging impact in science and engineering. The examination committee will consist of three faculty members, whom will have a primary appointment in Chemical Engineering. A faculty member who does not have an appointment from Chemical Engineering but serves or will serve as the co-advisor of the student can also serve on the first-year examination committee of this student. One of the three examination committee members will act as chair, the faculty member whose paper is chosen by the student, and communicate the examination results to the Graduate Committee.

In preparing the written document for the examination committee, it is strongly suggested that students not rely heavily on the content of previous student documents as a model for their own. Because multiple criteria are used to judge student performance for admission to Ph.D. candidacy, the written descriptions of previous candidates can vary widely in quality even for students who have been successful on the overall examination. It is recommended that any students with questions regarding style or content of the written document for the First-Year Examination address them to the Graduate Committee. In addition, the students should avoid plagiarism in the written document. All words, figures, or ideas that are not the students own should be cited or quoted appropriately. The written document is subject to the standards set forth in the University’s Academic Honesty Policy.

One to two days following submission of the document, the student appears before an examination committee. At the start of the examination the student makes an oral presentation, no more than 20 minutes in length, in which the student’s overview and critical analysis are presented and explained. The balance of the examination is devoted, for the most part, to questions from the committee.

The examination committee assesses the student’s performance with respect to four criteria:

(a) the student’s ability to evaluate published research critically
(b) the student’s creativity in suggesting new lines of research
(c) the strength of the written document with respect to both content and style
(d) the student’s grasp of Chemical Engineering fundamentals (i.e. transport phenomena, thermodynamics, and reaction engineering).
It should be noted that the examination committee may pursue lines of questioning that extend beyond the immediate subject of the student’s presentation in order to evaluate the student’s competence in a range of core Chemical Engineering topics.

As soon as possible following completion of the examination, the committee will report their evaluation of the student’s performance to the Graduate Committee. In addition, the committee will examine the student’s entire record (coursework, research performance, and examination results) and recommend to the department faculty whether the student should be encouraged to proceed toward Ph.D. candidacy. Recommendations of the committee include among others

(a) The student should be regarded as suitable for doctoral work and should proceed accordingly.
(b) The student should proceed with MS research and might be considered for Ph.D. candidacy after repeating the First-Year Examination.
(c) The student should be regarded as an MS candidate only and should be encouraged to plan accordingly.

After consideration of the committee’s recommendation, the department faculty will make the final decision, which then is reported to the student by the Graduate Committee as quickly as is feasible. An affirmative decision may include recommendations to the student to redress deficiencies by taking specific technical courses or courses designed to improve written or oral communication skills.

Example of First-Year Examination Scheduling/Timeline

May 2, 2015: Inform Grad Program Coordinator via e-mail of your intent to take the examination

May 9, 2015: Grad Program Coordinator will email three papers for you to choose one that you will use for the written portion of the exam

May 12, 2015: Send email to Grad Program Coordinator informing the department which paper you selected by 12:00 p.m.

May 19, 2015: Email written document to Grad Program Coordinator by 12:00 p.m.

Examinations: Week of May 23, 2015
University of Rochester
Department of Chemical Engineering

FIRST YEAR EXAMINATION

STUDENT PERFORMANCE EVALUATION FORM

Student: ________________________________

Faculty Member: __________________________

PART A: Assign a numerical score (1: poor – 5: excellent) to the following aspects of the student’s performance:

1) Understanding of the scientific basis of the topic 1 2 3 4 5
2) Understanding of major issues and objectives 1 2 3 4 5
3) Technical judgment – Ability to distinguish between relevant and irrelevant issues 1 2 3 4 5
4) Substance of proposed research
   Relevance 1 2 3 4 5
   Originality 1 2 3 4 5
   Technical details 1 2 3 4 5
5) Communication skills
   Oral presentation 1 2 3 4 5
   Written document 1 2 3 4 5
6) Chemical Engineering fundamentals
   Transport Phenomena 1 2 3 4 5
   Reaction Engineering 1 2 3 4 5
   Thermodynamics 1 2 3 4 5

PART B: Provide specific comments on the student’s performance in the exam. Specifically, identify deficiencies that require remedy.
These forms should be given to the chair of the committee who, in turn, should give an examination report and a copy of the evaluation forms to the Graduate Committee.

**Ph.D. Oral Qualifying Examination**

Formal admission to Ph.D. candidacy results from successful completion of the Ph.D. oral qualifying examination, administered by a faculty committee under the rules of the University as outlined in the Graduate Bulletin. The purpose of the oral examination is to determine the student’s ability to prepare useful independent research and to define a feasible plan for its accomplishment. In addition, admission to Ph.D. candidacy will be based upon successful demonstration of research performance and promise.

The students are expected to take this exam by the end of their second year of full-time graduate study. They are required to complete this examination by the end of the fall semester of their third academic year of residence in the department. It is the student’s responsibility to coordinate with his/her advisor to ensure the examination to be complete in time. Failure to do so can lead to the termination of financial support.

The student must request permission formally to take the Ph.D. oral exam by submitting to the faculty before the fall of the third year of residence a written document describing the thesis research. This document must contain:

1. A clear statement of the specific problem and its relationship to the field of study.
2. A detailed report on progress and problems to date.
3. An explicit discussion of the future plans and prospect for success.

In general, the length should be no more than 30 double-spaced typewritten pages. Upon approval of the written document by the faculty of the Department of Chemical Engineering (or a committee thereof) the student will be permitted to take the oral exam. The student will be notified of the Department’s decision within one week; and within two weeks after such approval, the oral exam will be scheduled. If the document is not approved, the student may resubmit a revised written document once.

The form of the written document should conform to the standard format of a technical report such as a research proposal or a journal article. The document should be written for an audience that is technically competent, but not necessarily expert in the thesis research area. Therefore, the document should be self-contained.

The oral examination will consist of a detailed discussion by the student that is based upon the research and will take the form of a seminar, approximately 30 minutes in length. The student should assume that the committee is familiar with the content of the written report and should use the opportunity to amplify or clarify the written discussion.

The student will be judged upon the degree of understanding of the problem, its placement within the context of research in the general field, and the research progress. The contribution of the student to the research will be assessed with particular care.
The result of the oral examination will be documented in accord with the University regulations: pass, fail, or adjournment will be recommended within one week following the examination.

Appeal of the committee decision may be made in accord with University regulations.

**Thesis Defense**

**Collaborative Work in Dissertation/Thesis:** The Graduate Studies Bulletin and The Preparation of Doctoral Theses: A Manual for Graduate Students (page four, www.rochester.edu/Theses) state that if a candidate for the degree Doctor of Philosophy has collaborated with others in carrying out the research upon which the dissertation is based, the character and extent of the candidate’s own participation in the project must be stated clearly in a Foreword to the dissertation. **The Foreword is a separate section immediately preceding the text and is numbered as page 1. Each co-authored chapter must be identified in the Foreword, listing its co-author(s).** This would apply to articles already published or accepted for publication, manuscripts that have been submitted for publication, or any other manuscripts.

**Defense Committee:** A defense committee should consist of two full-time faculty members from ChE and one full-time faculty member outside ChE. **The outside member cannot be your co-advisor.** See the graduate bulletin for full details.
Ph.D. Student Expectations and Responsibilities

http://www.rochester.edu/college/gradstudies/policies/phd.html

RESPONSIBILITIES OF TEACHING ASSISTANTS, PhD and MS

SUPERVISED COLLEGE TEACHING

All Ph.D. students admitted to the program are offered graduate fellowships that provide a competitive 12-month stipend and cover the costs of tuition and other fees. Support is guaranteed for four years subject to satisfactory academic progress. As part of their educational experience, all Ph.D. students are expected to provide undergraduate teaching assistance for two semesters.

As part of educational experience, all Master’s students are expected to provide undergraduate teaching assistance during their program of study.

Expectations and Responsibilities of TAs:

1. TAs should be polite, courteous, and respectful to all students.
2. TAs should have 2 hours/week of office hours, at a time that is convenient for the students in the course.
3. TAs are not expected to be available to answer students’ questions outside of office hours.
4. Students in courses are expected to observe the above restrictions on office hours.
5. TAs should be prepared to answer questions on the material being presented in class.
6. TAs share in the grading of homework and examinations.
7. TAs should grade and return homework assignments within a week after the due date of the assignments.
8. The department, if requested, will provide each graduate student with the opportunity to make classroom presentations.
GRADUATE STUDENT RESIDENCY, VACATIONS, AND LEAVE OF ABSENCE
(Approved 8/29/01)

General Guidelines and Principles

Graduate students are expected to be in residence the entire calendar year. Students must recognize that the periods when classes are not in session are the ideal times to devote to research and should plan to spend as much of that time as possible in productive research.

The need to take reasonable time off for vacation and time away from the academic program is recognized. However, graduate students should expect to take off no more than 10 working days per year. Such periods should be carefully arranged far in advance with the research advisor, a full semester or six months in advance is not too early. Graduate students need to be cognizant of all possible deadlines for manuscripts, abstracts, proposals, grant reports, and academic requirements such as TA assignments and the qualifying exam so that any vacation time does not adversely affect fulfilling these obligations.

If it becomes absolutely necessary for students to take leaves of absence for any time longer than a normal vacation period, they should not expect their stipends to continue while they are away. Such leaves must be approved, far in advance, by the student’s research advisor and should be considered a special privilege that is not generally available.

This policy is not intended to change the academic environment that we have into a workplace. Students and faculty alike should spend as much time as they can on their academic pursuits because it is enjoyable, not because they are compelled to do so. In keeping with the academic environment, necessary flexibility in this policy may be exercised, consistent with meeting the deadlines of assignments and research results. Each faculty member may choose to enforce this policy in his research group in a way that works best for him and his students. Any variations are at the option of the faculty advisor, and students should not expect that all variations will be generally available.

Vacation Approval Form

The research advisor and the department chair make final decisions regarding when and how long students may take time off from their research. Many factors affect such decisions. The research calendar has many deadlines that must be met: proposal submissions, abstracts for presentations at technical meetings, final reports to funding agencies, etc. All these activities are the joint responsibility of the research advisor and the students in the research lab. In addition, the academic calendar imposes special constraints. For example, graduate students in their first year of residency (and in some cases beyond the first year) have an obligation to support the teaching function of the department through service as a teaching assistant. Thus, every graduate student in this situation must schedule time off when it will not conflict with these TA responsibilities.
UNIVERSITY OF ROCHESTER
Department of Chemical Engineering

APPLICATION FOR EXTENDED VACATION

Full-time graduate students are expected to discuss any vacation plans with their research supervisor. In addition, vacation days cannot be taken when they will conflict with a student’s responsibilities as a teaching and research assistant.

Full-time graduate students who plan to be away from the department for five or more consecutive days must fill out this form and obtain approvals in advance, in accordance with the schedule presented below.

For vacation periods of five to nine days (excluding weekends but including holidays), this application form must be completed at least one month in advance of departure.

For vacation periods of ten or more days, this application must be completed at least two months in advance of departure.

Failure to comply with these deadlines may result in the loss of vacation privileges as well as the loss of stipend for the period of absence.

Student Name: ____________________________________________________________

Vacation period: __________________________________________________________

Date of return to assume full time responsibility: _____________________________

Thesis Advisor: _________________ Date: _________________

Department Chair: _________________ Date: _________________
Occupational Safety Unit  
Safety Training for Research Laboratory Personnel

OSHA Required Training

To assure compliance with federal and state regulations, those working in labs or supervising lab personnel must complete EH&S laboratory safety training annually. Is your lab safety training current? You can now check your individual training history through the HRMS PeopleSoft site - HRMS Sign-in. Once you log in using your netid and password, select the "Self Service" option from the main menu, then select "Learning and Development" and "Training Summary". You'll see a list of the various training courses you have completed at the University.

EH&S Lab Safety Training sessions include topics to comply with the following regulations:

- OSHA (Occupational Safety and Health Administration) compliance training for the standards:
  - Bloodborne Pathogens
  - Fire Safety
  - Formaldehyde Standard
  - Gas Cylinder Safety
  - Laboratory Standard
  - Personal Protective Equipment

- EPA (Environmental Protection Agency) issues for minimizing waste and disposal of regulated medical waste and hazardous waste

- General biosafety information including CDC (Centers for Disease Control and Prevention), New York State Department or Health, and Department of Environmental Conservation issues

Departments can schedule a live 3-hour session for their department provided a minimum of 20 people are scheduled for attendance. This can be scheduled by calling EH&S at x5-3241.

Computer-based Laboratory Safety Training, through the Blackboard system, is available for staff who are unable to attend a "live" session. Non-UR employees, non-UR students and volunteers may complete their lab safety training using the same Blackboard system, but must register for a "basic account" first. (Go to https://www.urmc.rochester.edu/libraries/miner/teaching_and_learning/blackboard/forms/create_user.cfm.)

Instructions on how to self-enroll in the course are available - Self-enroll in Lab Safety Training. The safety training has been customized for the various University lab staff:
• **Clinical Lab Personnel** - training program designed only for those who process human specimens.

• **Phlebotomists and Clinical Study Coordinators** - training program designed only for those who draw blood or coordinate clinical studies

• **Research Lab Personnel** - Laboratory Safety Training is now available through Blackboard.
  
  All individuals within a particular lab must complete the same training program. Select the program based on the activities in the lab - **You need to complete only one of the four options below. If you are not sure which one to take, the Biologicals/Chemicals/Animals covers the most information.**

  - **Biologicals/Chemicals/Animals** - training program designed for those staff working with chemicals, recombinant DNA, human specimens, or infectious agents
  
  - **Biologicals/Chemicals** - training program designed for those staff working with chemicals and recombinant DNA, human specimens or infectious agents but **NO** animals
  
  - **Chemical/Animals** - training program designed for those staff working with chemicals and animals
  
  - **Chemicals** - training program designed for those staff working with chemicals only and miscellaneous physical hazards are present

QUESTIONS or COMMENTS?
Contact EH&S at (585) 275-3241 or e-mail [EH&S Questions](mailto:EHSQuestions).
Academic Honesty Policy:

http://www.rochester.edu/College/honesty/graduates.html

Information for New Graduate Students

Graduate studies at the University of Rochester are decentralized and focused within individual Departments and Programs. These units are the most important sources of advice and information about programs and policies, and you should contact them directly about any specific issues.

In addition, you should read the current official Graduate Bulletin, paying particular attention to those sections governing your specific degree program and the section “Regulations and University Policies Regarding Graduate Study.”

Several items of general importance are discussed below. Additionally, the Council of Graduate Schools Resolution Regarding Graduate Scholars, Fellows, Trainees and Assistants can be downloaded here.

CREDENTIALS

Each entering student must eventually provide all documents requested in the application form (even when an offer is made prior to receipt of all such documents). These include transcripts and three letters of recommendation. Graduate admission is, in addition, contingent upon completion of the requirements for a Bachelor’s degree, or equivalent, unless an exception is explicitly noted in the letter of appointment.

The following materials were not requested with the application, but must be received:
- Supplementary or final transcript, including certification of the completion of any degrees (by date TBA, or a hold will be put on your ability to register for Spring 17)
- Health History Form

New York State Public Health Law #2165 requires that all full-time and part-time students enrolled for at least six credit hours per semester (or 4 quarter hours per quarter), born on or after January 1, 1957, attending a college or university in New York State, must provide evidence of immunity to Measles, Mumps, and Rubella. The law also mandates that full time students indicate receipt of information about Meningococcal disease and the availability of a vaccination for students. Students from countries where tuberculosis is endemic must be screened for TB using a PPD test. The University of Rochester also requires a tetanus vaccination, preferably containing Pertussis. Students not in compliance with the immunization requirements will be withdrawn from school and required to leave campus. All of this information is included in the Health History Form packet that you will receive after accepting admission to the University. Further information about the immunization requirements is on the University Health Service website in the Student Services section.
The Immigration Reform and Control Act of 1986 requires all students receiving assistantships from the University to submit proof of their employment eligibility. Failure to complete an Employment Eligibility Verification (Form I-9) will result in termination of an assistantship.

Documents that establish both identity and employment eligibility are (a) a US passport, (b) a certificate of US citizenship, (c) a certificate of naturalization, (d) an unexpired foreign passport with attached employment authorization or (e) an alien registration card with photograph.

OR

You can prove your identity by providing a US Military Card, a state-issued driver’s license, or a state-issued ID card with a photograph that includes your name, sex, date of birth, height, weight, and color of eyes. You can establish employment eligibility by producing either an original Social Security number card (other than a card stating it is not valid for employment), a birth certificate issued by a state, country, or municipal authority bearing a seal or other certification, or by an unexpired USCIS Employment Authorization.

The Employment Verification forms (Form I-9) will be available in your Department/Program office. A departmental representative will be happy to certify it for you.

REGISTRATION

All students holding teaching or research assistantships must register for at least nine credit hours (but not more than twelve credit hours) in order to be considered full-time. Students not holding assistantships must register for at least twelve credit hours (but not more than sixteen credit hours) in order to maintain full-time status; this also includes holders of Fellowships and Traineeships who are not teaching or department assistants.

Classes begin Wednesday, August 31, 2016. Registration must be completed within two weeks from the first day of classes (September 13, 2016) or a late registration fee will be charged ($160.00). First-year graduate students should plan to arrive on campus at least one week before the first day of classes (especially if you are looking for housing) to allow time for consultation with departmental advisers, course selection and registration. International students may have to arrive early for the University of Rochester’s 4-week Summer Intensive English Course and/or International Student Orientation, usually held in Mid-August.

DROPPED COURSES

A regular semester course may be dropped at any time through the sixth week of classes, provided the student obtains the approval of his or her faculty advisor and the instructor(s), notifies the graduate registrar on the proper drop/add form, and the change does not alter the student’s time status. No record of such actions appears on the official transcript.

Following the start of the seventh week of classes, a drop notification (or a change from credit to audit) sent to the graduate registrar must bear the signatures of the faculty advisor, course instructor(s), and associate dean of graduate studies. Such late drops will be recorded on the official transcript and identified by the grade W. At the option of the course instructor, a grade of E may also be attached.
In exceptional circumstances, the associate dean of graduate studies will review the circumstances as initiated by an appropriate written petition.

Dropping credit hours after the seventh week of a semester or retroactive after the conclusion of the semester is not permitted if the change affects the student’s time status (full-time status changes to part-time status) for that particular semester. No academic credit is granted for courses in progress at the time a student withdraws from the University, except by explicit approval of the associate dean acting upon a written petition.

ENGLISH LANGUAGE TESTING

Strong English language skills are vital to your success in the program and to your future career. If you have any doubt about your English abilities, you are strongly encouraged to take additional training in English. All incoming graduate students whose first language is not English and who will be teaching assistants in the coming year are required to be tested for their English proficiency. Individual oral testing with a language specialist will be held in late August. Students will sign up for a 15 minute timeframe for the testing. Students must ensure that they are on campus and available for the testing. If you are delayed due to visa issues, you will be contacted regarding a reschedule.

Students whose language skills are judged to not be satisfactory will be required to take an English as a Second Language course designed specifically for International Graduate Students (at a cost of approximately $625). This course emphasizes the acquisition of English cultural and linguistic skills needed for clear communication in the university and career environments. Primary areas covered will be accent reduction, pragmatics (culture’s role in language), nonverbal communication, public speaking, and academic and business writing.

IMMIGRATION DOCUMENTS

International students who require immigration sponsorships as an F-1 or J-1 student should return the New Student Request for an I-20/DS-2019 form to their Department/Program as soon as possible after the offer of admission has been accepted. Supporting documents may also be required, including a passport copy and proof of financial support, if needed. This form and detailed instructions can be found on the International Services Office (ISO) website. The ISO is unable to issue necessary immigration documents without complete and accurate information.

APPOINTMENTS AND AWARDS

The University of Rochester, as a member of the Council of Graduate Schools in the United States, subscribes to the Resolution Regarding Graduate Scholars, Fellows, Trainees, and Assistants. In accordance with that Resolution, “when a student accepts an offer before April 15 and subsequently desires to withdraw, the student must submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining a written release from the institution to which a commitment has been made.”
The continuity of all appointments and awards, and the eligibility for reappointment, require that the student make satisfactory academic progress. Any award can be terminated, at any time, if the academic work is regarded as unsatisfactory.

EXTERNAL WORK POLICY

Full-time students holding fellowships, assistantships, or scholarships may not accept other full-time employment.

FINANCIAL AID

Merit-based awards are provided by the academic department during the admission process, while federal and private loan funding can be obtained through the Financial Aid Office. Graduate students may borrow up to a maximum of $20,500 per academic year through the Federal Direct unsubsidized loan program. The actual amount a student is eligible to borrow cannot exceed the University of Rochester’s cost of attendance minus any other assistance received, including merit-based awards and tuition waivers provided by employers.

The application required for federal student loans is the Free Application for Federal Student Aid (FAFSA), available at www.fafsa.ed.gov. Students who have completed their application materials will be reviewed for aid eligibility. Eligibility is determined based upon planned enrollment.

Please contact the Financial Aid Office at (800) 881-8234 or visit the website at http://enrollment.rochester.edu/financial/ for additional details on loans and contact information for staff members.

SUPERVISED TEACHING

All graduate students matriculated for the PhD degree are required to perform a certain amount of teaching assistance as part of their education. Teaching experience deepens and enriches a student’s understanding of the discipline and provides invaluable professional training and is, therefore, considered to be a vital component of any PhD program. The amount and nature of the teaching varies according to Departments and Programs. This requirement is independent of whether the student is receiving a fellowship, scholarship, or assistantship, although teaching assistants will, by virtue of their assignments, automatically fulfill this requirement.

TA TRAINING

There will be an all-day TA training workshop in late August. This workshop is open to all first-time teaching assistants. Please check with your specific program to see if attendance at this workshop is mandatory and, if so, plan your arrival on campus accordingly.
STUDENT HEALTH PROGRAM

The Student Health Program for full-time students has two parts:

Mandatory Health Fee

(1) The mandatory health fee, which is paid by all full-time students through their tuition billing statement, covers the cost of visits with physicians, nurse practitioners, and registered nurses at the University Health Service (UHS), short-term psychotherapy at the University Counseling Center (UCC), health education services, and public health/disease prevention programs. The cost of the mandatory health fee is $264 per semester for 2015-2016. Each year the fees are posted on the UHS website.

Health Insurance

(2) In addition to the mandatory health fee, all full-time students must have health insurance. Students can enroll in the University-sponsored health insurance plan offered through the University Health Service or remain on their own health insurance.

Each year, all full-time students must complete the online Health Insurance Enrollment/Waiver Process before the start of classes to indicate their health insurance coverage. The link to this online process is in the pink Quick Links box on the UHS website. Health insurance generally covers the cost of services such as hospitalization, surgical procedures, and diagnostic laboratory tests and x-rays; the mandatory health fee does not cover these services. The benefits covered by health insurance will vary depending on the student’s insurance plan.

The cost of the single health insurance offered through the University Health Service is $2,460 per year for 2016-2017. Students who choose to remain on their own insurance plan can waive this portion of the fee if their insurance plan meets University standards. (The health insurance fee increase is usually within 10% each year.)

Insurance Options for Married Students: Due to the high cost of health care, it is recommended that students have health insurance coverage for their families who are with them in Rochester. Students who enroll in the University-sponsored insurance can also enroll their spouse and dependent children. Spouses who enroll in the insurance plan must also pay the mandatory health fee, which covers their visits to the University Health Service and the University Counseling Center.

All non-immigrant international students and their families who are in the United States with them must comply with immigration requirements and University policies governing health insurance.

Further information about the University Health Service and health insurance for students is available on the University Health Service website.  http://www.rochester.edu/uhs/
# 2018-2017 Schedule of Charges for Graduate Studies

## School or College

<table>
<thead>
<tr>
<th>School or College</th>
<th>Tuition Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts &amp; Sciences</td>
<td>$1,638.00 / credit hour</td>
</tr>
<tr>
<td>Matriculated</td>
<td>$1,638.00 / credit hour</td>
</tr>
<tr>
<td>Non-matriculated</td>
<td>$508.00 / credit hour</td>
</tr>
<tr>
<td>Engineering and Applied Sciences</td>
<td>$1,538.00 / credit hour</td>
</tr>
<tr>
<td>Technical Entrepreneurship &amp; Management</td>
<td>$1,000.00 / credit hour</td>
</tr>
<tr>
<td>Warner Graduate School of Education</td>
<td>$1,390.00 / credit hour</td>
</tr>
<tr>
<td>School of Medicine and Dentistry</td>
<td>$1,538.00 / credit hour</td>
</tr>
<tr>
<td>School of Nursing</td>
<td>$1,400.00 / credit hour</td>
</tr>
</tbody>
</table>

## Audit Fees

| Arts & Science, Education, Engineering, Technical Entrepreneurship & Management and School of Medicine & Dentistry | $175.00 / credit hour |

## Registration Fees

| 995 Continuation of Masters Enrollment (no health fees charged) | $1,070.00 / semester |
| 999 Masters Dissertatation | $1,070.00 / semester |
| 999 Leave of Absence | $500.00 / semester |
| 999 Continuation of Doctoral Enrollment (no health fees charged) | $1,070.00 / semester |
| 999 Doctoral Dissertation | $1,070.00 / semester |
| Late Registration Fee | $190.00 / semester |

## Other Fees

- Activity Fee: Arts & Science, Engineering & Nursing: $10.00 / semester
- Program Fee: Technical Entrepreneurship & Management: $230.00 / semester
- Part-time Non-Degree Health Record Processing Fee: $35.00
- International Student Fee: $35.00 / semester

## Health and Insurance Fees

<table>
<thead>
<tr>
<th>Mandatory Health Fee</th>
<th>All Full-time Students</th>
<th>Per semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Insurance</td>
<td>$280.00</td>
<td></td>
</tr>
<tr>
<td>Child</td>
<td>$2,400.00</td>
<td></td>
</tr>
<tr>
<td>Two+ Children</td>
<td>$4,920.00</td>
<td></td>
</tr>
</tbody>
</table>

* Separate schedules are available for the Eastman School of Music, the School of Nursing and the Simon Business School.

**Fall Semester:** September - November
**Spring Semester:** January - May