



## Graduate Guidebook

Department of Chemical Engineering

Version 26.02

*"A Community of Scholars"*

2025-2026

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## 1. Introduction

Welcome to the Northeastern University Chemical Engineering Graduate Program. The goals of our Graduate Program are (1) to create an effective learning environment that provides consistent, high-quality educational opportunities to all students, and (2) to promote scholarly achievement for both faculty and students. This graduate guidebook is a living document to provide guidance to students on policies designed to ensure that the Graduate Program reaches these goals. The guidebook is sent via email to current graduate students at the beginning of each semester and is also available on the [College of Engineering website](#), the [Department website](#), or [Canvas](#). Any policy changes will be made based on the assumption that there will be no negative impact on current students. If the guidebook is in conflict with college or university policies, the college or university policy shall be followed.

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This guidebook contains department policies, and college and department graduation requirements. The guidebook is intended to be a common source for all information students need. It is ultimately the responsibility of each student to verify graduation requirements and necessary deadlines within the Graduate School of Engineering (GSE).

If you are a Master of Science student, you can reach the Graduate Student Services team at [coe-chme-gradadvising@northeastern.edu](mailto:coe-chme-gradadvising@northeastern.edu). If you are a PhD student, reach out to the Graduate Student Services team via [coe-phd-gradadvising@northeastern.edu](mailto:coe-phd-gradadvising@northeastern.edu).

Questions or suggestions on the content in this guidebook should be directed to the Chemical Engineering Department at [COECHEME@northeastern.edu](mailto:COECHEME@northeastern.edu), the Academic Coordinator, the Associate Chair of Graduate Studies, or the Associate Director of MS Programs:

Academic Coordinator	Anastasia Kreisel 201B Cullinane Hall <a href="mailto:a.kreisel@northeastern.edu">a.kreisel@northeastern.edu</a>
Associate Chair of Graduate Studies	Prof. Eno Ebong 221 ISEC <a href="mailto:e.ebong@northeastern.edu">e.ebong@northeastern.edu</a>
Associate Director of MS Programs	Prof. Adam Ekenseair 217 Cullinane Hall <a href="mailto:a.ekenseair@northeastern.edu">a.ekenseair@northeastern.edu</a>

Forms referenced and linked to in this guidebook can be found on the department's graduate Canvas site or the COE website. It is the responsibility of the student to complete the forms in a timely manner as explained in the guidebook. The forms are to be submitted through DocuSign or AdobeSign when possible. DocuSign and AdobeSign help us efficiently process the forms and helps us with record keeping. Students who do not utilize DocuSign or AdobeSign risk delays in processing their forms, increasing the possibility of them being lost.

### 1.1. Programs Offered

The Department of Chemical Engineering offers a range of advanced degrees:

- [Master of Science in Chemical Engineering](#): Available in three options:
  - **Project option** (full-time)
  - **Thesis option** (full-time)
  - **Course-only option** (full-time or part-time)
- [Master of Science in Pharmaceutical Engineering](#): Offered in collaboration with the Department of Pharmaceutical Sciences in the Bouvé College of Health Sciences. Full-time and part-time options are available.
- [Doctor of Philosophy \(PhD\) in Chemical Engineering](#): Primarily pursued full-time. The department also participates in Northeastern's Experiential Industry PhD Program, allowing qualified individuals to earn a PhD while working full-time in the industry.

Additionally, Students have the option to pursue additional [graduate certificates](#) to further specialize their expertise.

### 1.2. Academic pathways within our Programs

Students wishing to pursue a customized academic path that deviates from the standard programs (full-time thesis MS, full-time project MS, full-time or part-time non-thesis MS, full-time PhD) must submit a petition to the Graduate Education Committee. The petition form is available on the College of Engineering (COE) [Graduate Office website](#). It must be completed by the student, approved by the faculty advisor, approved by the Associate Chair of Graduate Studies or the Associate Director of MS Programs, and submitted to the Chemical Engineering Graduate Education Committee via AdobeSign. Each petition will be reviewed on a case-by-case basis.

### 1.3. Further Program Related Information

#### 1.3.1 Full-Time Status

Students must register for 8 semester hours (SH) each semester to maintain full-time status. If their coursework falls short of this requirement, the department provides 0 SH courses to meet the credit minimum. Please refer to each Degree section for further information.

#### 1.3.3 Language Requirement

There is no foreign language requirement for our Programs. Candidate must be proficient in technical writing and oral presentation in the English language. In addition to general admission English language requirements, the Chemical Engineering Graduate Education Committee may require additional coursework to improve English proficiency. Students are encouraged to utilize [Communications Lab](#) resources.

#### 1.3.4 Part-Time Students

Part-time student status is more common for our MS programs and rare for our PhD programs. Part-time students may progress according to their plans and time constraints but within the seven-year time limit. Students wishing to change their status from full time to part time, or from part time to full time, must notify the chemical engineering department and make a formal petition to the Graduate School of Engineering. Refer to the Graduate School of Engineering regulations for more information on academic administrative policies.

#### 1.3.5 Switching from MS to PhD

A student working on their MS degree may reapply and be accepted into the PhD program. So long as the student hasn't received their MS degree, some of the credits earned while in the Master's program can be transferred to the PhD program. Students should note that there are restrictions for transferring research credit from the MS to the PhD program. Specifically, the 0-SH CHME 7986 cannot be transferred or converted to anything for credit. Furthermore, the 4-SH MS Project (CHME 7945) or 4-SH Thesis (CHME 7990) can also not be easily converted but can be petitioned to be used toward elective credit. Students who earn credit for research projects outside Thesis or MS Project through 1-SH to 4-SH of the Directed Study (CHME 5976 or CHME 7976) should note that the PhD program does not accept Directed Study credits in fulfillment of the degree requirements. To request a graduate credit transfer, students must complete the COE Graduate Petition to Transfer Credit form via AdobeSign. They must attach an official transcript that includes the completed course and a syllabus specifically from that completed course. Once submitted, the petition is reviewed by the Chemical Engineering Graduate Education Committee for an initial decision. Final approval is determined by the registrar, who verifies that the course was not counted toward a prior degree and that a grade of B or higher was earned. Courses used for a prior degree or with grades of B-minus or lower are not eligible for transfer.

If a student completes the MS degree before moving on to the PhD program, then the MS credits stay as recorded for their MS degree requirements. On transitioning from the MS to PhD, the guidelines for PhD Degree Advanced Entry will apply; see guidelines described in a later section of this document.

MS students hoping to apply to the PhD program should engage in research as early as possible and subsequently communicate their intent to their research advisor as early as possible.

### 1.3.6 Advanced Entry for PhD Program in Chemical Engineering

The Advanced Entry option allows PhD students to be exempt from taking **three core courses** if they have **already completed a relevant graduate degree in chemical engineering or a closely related discipline**.

To qualify, students must have **completed the prior graduate degree within the last four years** and **achieved a grade of at least A-minus in courses that are equivalent to the three core courses they seek to waive**. Students who have completed fewer than three equivalent courses or earned less than an A-minus in their prior completed courses can still request the Advanced Entry option. Approval of these requests will require substantial justification and may not be granted.

**Students interested in the Advanced Entry option must follow these steps:**

- **Documentation:** Before starting the PhD program, students must provide an official transcript and degree completion certificate via the Admissions website.
- **Petition the Graduate Education Committee:** The [Standard Petition Form](#) or submission to the Chemical Engineering Graduate Education Committee, along with sample forms, can be found here: [Graduate Forms - Northeastern University College of Engineering](#). This form needs to include a copy of the transcript from the prior graduate degree and detailed syllabi from the three equivalent courses. This needs to be submitted before the first Fall term. Incomplete petitions will be declined.
- **Review Process:** The Associate Chair for Graduate Studies and the Academic Coordinator will submit the petition to the department Graduate Education Committee for review, and they may request additional documentation. The review process may take time, and the Academic Coordinator will provide updates along the way. The Graduate Education Committee reserves the right to require students to take or retake any or all core courses before achieving candidacy if mastery is not demonstrated.

### 1.3.7 Departure Prior to Thesis or Dissertation Completion

Graduate students who leave the department without completing their degree requirements often face delays in submitting their thesis or dissertation. If a student is inactive for two consecutive fall or spring semesters without an approved leave, they will be declared inactive and must petition to return and register for classes. If the petition is denied, they will be automatically withdrawn from Northeastern University. Students who leave for four consecutive fall or spring semesters without an approved leave will also be automatically withdrawn and must reapply for admission, with no guarantee of readmission. If readmitted, they must follow the updated curriculum in effect at that time. Additionally, courses taken

prior to leaving may not count toward degree requirements due to university time limits, and all policies regarding candidacy and degree completion remain in effect. **The Department of Chemical Engineering does not allow exceptions to any College of Engineering or Northeastern University rules.**

### 1.3.8. MS along the way

Some PhD candidates who entered without an MS degree may want to obtain an MS degree along the way to their PhD. This is possible, as long as the student meets the requirements for the MS degree, including 32 SH of coursework. Students wishing to pursue this option should meet with the Associate Chair for Graduate Studies, the Associate Director of MS Programs, and their College of Engineering Graduate Student Services advisor to discuss the details. This action is possible upon approval of the Graduate Education Committee.

### 1.3.9 Additional Electives

Students are allowed and encouraged to take courses outside of Chemical Engineering that they and their advisor feel are related to and diversify their areas of research. The following considerations should be taken into account when seeking graduate credit for courses taken other than the graduate courses offered by the Northeastern University Chemical Engineering Department (CHME) or the College Interdisciplinary Engineering Courses (ENGR).

- 1) In addition to the policies described in this Guidebook, all course credit rules of the College of Engineering must be met. These can be found in the Graduate > College of Engineering > [Academic Policies and Procedures](#) section of the Northeastern Course Catalog. For example, typically no more than 9 semester hours (inclusive of transfer credits and advanced standing for MS programs) may be taken outside the College of Engineering.
- 2) Any CHME or ENGR course at the 5000 level or higher is automatically counted toward degree requirements. **Any student wishing to take a 5000 level or higher course in *another* engineering discipline or in another College must get permission from their faculty advisor and submit a petition form signed by the department's Associate Director of MS Programs and approved by the Graduate School of Engineering for the course to count toward their degree.** While approval for a course can be gained by petition at any time, a student risks taking a course that will not count toward graduation if the petition form is not submitted and approved prior to the start of the course. The petition form can be found on the Graduate School of College of Engineering website at <http://www.coe.neu.edu/student-services/graduate-forms>.
- 3) While undergraduate courses may be required for effective matriculation toward a graduate degree, undergraduate courses do not count toward graduate course requirements per university rule.
- 4) To count a graduate course taken under undergraduate status:
  - a. For MS or PhD students to count a graduate course taken under undergraduate status:
    - i. Once admitted to Northeastern University, access the "Graduate Petition to Transfer Credit" form on the College of Engineering (COE) Graduate Office website.
    - ii. Complete the form via AdobeSign. Attach a copy of an official transcript with the requested course on it. Attach a copy of the relevant syllabus for the course that

- was completed. Submit the form. It will be forwarded to the Chemical Engineering Graduate Education Committee for review and an initial decision.
- iii. The registrar will make a final decision upon review of the credit transfer petition to ensure the course was not used towards the undergraduate degree and the grade earned is B or better. Courses that counted towards the undergraduate degree or in which grades of B-minus or less were earned cannot be transferred to count towards the MS degree.
- b. For PlusOne Students pursuing the 1-year MS degree after the Northeastern University BS degree:
- i. List courses intended for undergraduate and MS degree double counting in the Slate application for entry into the PlusOne program.
  - ii. If a course is not pre-approved for double counting, the College of Engineering (COE) Graduate Office will require the applicant to complete the “Standard Petition” form along with the Slate application.
  - iii. Both the Slate application and “Standard Petition” form need approval before PlusOne admission will be granted.

#### 1.4. Co-Op

##### What is Co-op?

Experiential Learning through Co-op helps you connect with a target organization and earn income while you learn. It provides an opportunity to showcase your skills and make valuable connections, whether you want to re-enter the workforce, preview a particular field, or apply classroom theories to real-world jobs.

##### Eligibility:

Full-time MS and PhD students have the option to participate in the Cooperative Education Program (Co-op). For detailed information on eligibility, requirements, and application procedures, visit [Co-op Advantage](#). PhD students and MS students pursuing the thesis option **must obtain approval from their advisors** before participating in the Co-op program.

##### Pre-Co-op Requirements:

Before starting a Co-op, you must complete the Co-op preparatory course ENCP 6000 or ENCP 6100. For more information, contact Jake Walker ([JW.walker@northeastern.edu](mailto:JW.walker@northeastern.edu))

#### 1.5. Departmental GPA Requirements

Per COE rules, all MS and PhD students must maintain a cumulative GPA of 3.0 or higher to graduate and retain Departmental and COE funding (see [here](#) for more information).

For **PhD students**, the Department of Chemical Engineering requires an additional **cumulative 3.25 GPA in core courses, with no grade below a B-minus**, as a replacement for the general qualifying exam. This GPA requirement functions as the qualifying exam, and students must meet it before petitioning for PhD candidacy. If needed, PhD students may petition the Chemical Engineering Graduate Education Committee to repeat courses to improve their GPA. PhD students who do not meet the core GPA

requirement will be dismissed from the PhD program, with the option to receive an MS degree if they qualify.

### 1.6. Academic Integrity and Data Manipulation

Students are expected to read, understand, and follow Northeastern University [Academic Integrity Policy](#). Northeastern policy may differ from your previous institution. Additionally, data misconduct and/or figure manipulation will not be tolerated. If you have any questions, ask an instructor.

Students are reminded that we all have a role in upholding the Academic Integrity Policy, and any member of the Northeastern University community who witnesses a violation of the policy (in any class) should report it to the appropriate faculty member or the Office of Student Conduct & Conflict Resolution (OSCCR).

The Department's [procedures for protecting against plagiarism in thesis and dissertation documents](#) are available on the graduate [Canvas](#) site and must be followed for thesis, proposal, and dissertation submission. Links for checking theses, proposals, dissertations, and other documents for apparent plagiarism are available in the [Assignments](#) section.

#### 1.6.1 Plagiarism Prevention

Students must submit their thesis or dissertation through Turnitin, along with an annotated report that includes comments. **Two weeks before the defense**, this report must be sent by email to the committee, Associate Chair of Graduate Affairs (for PhD dissertations) or Associate Director of MS Programs (for MS theses), Academic Coordinator, and Department Chair (cc the Special Assistant to the Chair Terry Holden, [t.holden@northeastern.edu](mailto:t.holden@northeastern.edu)). If revisions are made, before the approval form is signed an updated Turnitin report with comments on the final version must be submitted.

Detailed instructions and the policy are available on the Canvas site under the [Assignments section](#).

## 2. Certificates

Northeastern University offers many [Graduate Certificates](#) that can overlap with your graduate degree, with course credits counting towards both qualifications. A few certificates of particular interest to Chemical Engineering students are listed below.

2.1. <a href="#">Graduate Certificate in Process Safety Engineering</a>	12 SH total
Core Courses	

CHME 5510 or CHME 5515	Fundamentals in Process Safety Engineering	4 SH
	Process Safety Engineering for Biotechnology and Pharmaceutical Industries	4 SH
CHME 5520	Process Safety Engineering - Chemical Reactivity, Reliefs and Hazards Analysis	4 SH
<b>Electives (one of the following)</b>		
BIOE 5115	Dynamical Systems in Biological Engineering	4 SH
CHME 5630	<b>Biochemical Engineering</b>	4 SH
CHME 5692	Carbon Capture, Utilization, and Storage	4 SH
CHME 7600	Pharmaceutical Engineering I	4 SH
CIVE 5275	Life Cycle Assessment of Materials, Products, and Infrastructure	4 SH
CIVE 5365	Climate Technologies for Decarbonization, Mitigation, and Adaptation	4 SH
CIVE 5368	Air Quality Management	4 SH
IE 5380	<b>Integrated Automation</b>	4 SH
IE 5400	Healthcare Systems Modeling and Analysis	4 SH
IE 6300	Manufacturing Systems Design	4 SH
IE 7285	<b>Statistical Quality Control</b>	4 SH
ME 5659	Control Systems Engineering	4 SH

<b>2.2. <a href="#">Graduate Certificate in Nanomedicine</a></b>		12 SH total
NNMD 5270 or NNMD 5271	Foundations in Nanomedicine: Therapeutics	3 SH
	Foundations in Nanomedicine: Diagnostics	3 SH
<b>Complete at least 5 SH of the following:</b>		
NNMD 5272	Nanomedicine Seminar 1	1 SH

NNMD 5310	Bioethics in the Age of Artificial Intelligence	1 SH
NNMD 5370	Nanomedicine Research Techniques	4 SH
NNMD 5380	Electron Microscopy Techniques	4 SH
NNMD 5470	Nano/Biomedical Commercialization: Concept to Market	3 SH
NNMD 5570	Preclinical and Clinical Study Design	3 SH
Complete 4 SH of electives chosen from COE courses, such as BIOE5820, BIOE6100, CHME5630, CHME 5631, CHME 5683, CHME7350.		

<b>2.3. <a href="#">Gordon Institute of Engineering Leadership</a></b>		16 SH total
ENLR 5121	Engineering Leadership 1	2 SH
ENLR 5122	Engineering Leadership 2	2 SH
ENLR 5131	Scientific Principles of Engineering 1	2 SH
ENLR 5132	Scientific Principles of Engineering 2	2 SH
ENLR 7440 <sup>a</sup>	Engineering Leadership Challenge Project 1	4 SH
ENLR 7442 <sup>b</sup>	Engineering Leadership Challenge Project 1	4 SH

a. ENLR 7400 can be replaced with EECE 7440, ENSY 7440, IE 7440, ME 7440, or TELR 7440

b. ENLR 7442 can be replaced with EECE 7440, ENSY 7442, IE 7442, ME 7442, or TELR 7442

### 3. Master of Science Degree in Chemical Engineering

The Master of Science in Chemical Engineering is normally pursued by students with a Bachelor of Science in Chemical Engineering or a closely aligned field. Students wishing to pursue the MS Degree with undergraduate educational backgrounds other than Chemical Engineering are advised to take CHME 5101 and CHME 5102 as electives in their first year. They may be required to complete supplementary undergraduate coursework, in addition to the minimum course requirements. The Department of Chemical Engineering Graduate Education Committee will specify any additional requirements during the admission process.

MS students are advised by the Associate Director of MS Programs, who assists with course planning.

Thesis MS students are also advised by the Associate Director of MS Programs until they select a faculty

research advisor, who will then guide their research and course selection.

To maintain full-time enrollment status after completing required MS program credits while thesis research continues, students must enroll in designated research or thesis courses. Details are provided in the “Course Requirements” section below. The COE Graduate School does not require part-time students to meet a minimum enrollment threshold.

### 3.1. Course Requirements

A minimum of 32 semester hours of academic work is required of all full-time students (continuous and cooperative full-time students) to qualify for the master’s in chemical engineering.

If pursuing the **General Principles and Applications concentration**, once students are assigned to a thesis research advisor they should work with the research advisor to establish the sequence of courses that they will take to pursue the Master of Science in Chemical Engineering. In addition, students can select from either the **master’s project option or master’s thesis option**. Students completing the **master’s project** will take the 4-SH master’s project course (CHME 7945) and 4 SHs of a core course. Students in the **thesis track** will complete the 4-SH master’s project course followed by the 4-SH thesis course (CHME 7990). In addition, each full-time student pursuing a thesis option must enroll in Professional Development and Communication Essentials (CHME 6390) in their first two semesters followed by Seminar (CHME 7390) for each semester they continue to work toward their degree.

Full-time Master of Science degree **General Principles and Applications concentration** students who complete the required 4 SHs of project work (CHME 7945) and the 4 SHs of thesis work (CHME 7990) but need an additional semester to complete the thesis work are required to register for the 0 SH CHME 7986 Research course, UNLESS they are taking enough classes to be considered full time. Note that although this is a 0 SH course, tuition is still charged. To inquire about the tuition rate, contact the Graduate Student Services team at [coe-chme-gradadvising@northeastern.edu](mailto:coe-chme-gradadvising@northeastern.edu) and the Student Financial Services team at [SFS@northeastern.edu](mailto:SFS@northeastern.edu). Students registered for this course are considered full-time.

If Master of Science **General Principles and Applications concentration** students are on part-time status in the semester following completion of the required 4 SHs of project work (CHME 7945) and the 4 SHs of thesis work (CHME 7990) but an additional semester is needed to complete the thesis work, the 0-SH CHME 7996 Thesis Continuation course should be registered for. Although this is a 0 SH course, tuition is still charged. For tuition details, contact the Graduate Student Services team at [coe-chme-gradadvising@northeastern.edu](mailto:coe-chme-gradadvising@northeastern.edu) and the Student Financial Services team at [SFS@northeastern.edu](mailto:SFS@northeastern.edu). Enrollment in this course confers half-time registration status.

If pursuing the **Biosystems or Sustainability concentrations**, students must complete a minimum of 32 SHs of coursework. In addition, during their first two semesters of enrollment, they must complete Professional Development and Communication Essentials (CHME 6390). Once the 32 SHs are complete, since these students are not pursuing a thesis option, no enrollment in Chemical Engineering Seminar is

required, although it is encouraged.

3.1.1 Master of Science Core Requirements		SH
<a href="#">CHME 6310</a>	Python for Chemical Engineers	2
<a href="#">CHME 6320</a>	Numerical and Statistical Methods for Chemical Engineering	4
<a href="#">CHME 6390</a>	Professional Development and Communication Essentials (complete in the first two semesters in the program)	0

3.1.2 Biosystems Concentration Requirements		SH
<a href="#">CHME 5160</a>	Drug Delivery: Engineering Analysis	4
or <a href="#">CHME 5630</a>	Biochemical Engineering	
<a href="#">CHME 6430</a>	Chemical Engineering for Biosystems and Biomaterials	2
<b>Complete 8 semester hours from the following (courses cannot count in multiple categories):</b>		<b>8</b>
<a href="#">CHME 5160</a>	Drug Delivery: Engineering Analysis	
<a href="#">CHME 5185</a>	Design of Experiments and Ethical Research (DOEER)	
<a href="#">CHME 5515</a>	Process Safety Engineering for Biotechnology and Pharmaceutical Industries	
<a href="#">CHME 5630</a>	Biochemical Engineering	
<a href="#">CHME 5631</a>	Biomaterials Principles and Applications	
<a href="#">CHME 5632</a>	Advanced Topics in Biomaterials	
<a href="#">CHME 5683</a>	Introduction to Polymer Science	
<b>Biosystems Breadth Electives</b>		
<b>Complete 12 semester hours from the following (courses cannot count in multiple categories):</b>		<b>12</b>
<a href="#">BIOE 5410</a>	Molecular Bioengineering	
<a href="#">CHEM 5620</a>	Protein Chemistry	
<a href="#">CHEM 5625</a>	Chemistry and Design of Protein Pharmaceuticals	
<a href="#">CHEM 5638</a>	Molecular Modeling	
<a href="#">CHME 5105</a>	Materials Characterization Techniques	
<a href="#">CHME 5137</a>	Computational Modeling in Chemical Engineering	

<a href="#">CHME 5160</a>	Drug Delivery: Engineering Analysis	
<a href="#">CHME 5179</a>	Complex Fluids and Everyday Materials	
<a href="#">CHME 5185</a>	Design of Experiments and Ethical Research (DOEER)	
<a href="#">CHME 5510</a>	Fundamentals in Process Safety Engineering	
<a href="#">CHME 5515</a>	Process Safety Engineering for Biotechnology and Pharmaceutical Industries	
<a href="#">CHME 5621</a>	Electrochemical Engineering	
<a href="#">CHME 5630</a>	Biochemical Engineering	
<a href="#">CHME 5631</a>	Biomaterials Principles and Applications	
<a href="#">CHME 5632</a>	Advanced Topics in Biomaterials	
<a href="#">CHME 5642</a>	Photochemistry Fundamentals and Applications	
<a href="#">CHME 5649</a>	Numerical Strategies and Data Analytics for Chemical Sciences	
<a href="#">CHME 5683</a>	Introduction to Polymer Science	
<a href="#">CHME 5699</a>	Special Topics in Chemical Engineering	
<a href="#">CHME 7330</a>	Chemical Engineering Thermodynamics	
<a href="#">CHME 7340</a>	Chemical Engineering Kinetics	
<a href="#">CHME 7350</a>	Transport Phenomena	
<a href="#">CHME 7600</a>	Pharmaceutical Engineering I	
<a href="#">CHME 7601</a>	Pharmaceutical Engineering II	
<a href="#">CHME 7973</a>	Special Topics in Chemical Engineering	
<a href="#">CIVE 7251</a>	Environmental Biological Processes	
<a href="#">EMGT 5220</a>	Engineering Project Management	
<a href="#">EMGT 6225</a>	Economic Decision Making	
<a href="#">EMGT 6305</a>	Financial Management for Engineers	
<a href="#">IE 6200</a>	Engineering Probability and Statistics	
<a href="#">IE 7280</a>	Statistical Methods in Engineering	
<a href="#">IE 7285</a>	Statistical Quality Control	
<a href="#">ME 5620</a>	Fundamentals of Advanced Materials	
<a href="#">NNMD 5270</a>	Foundations in Nanomedicine: Therapeutics	
<a href="#">NNMD 5370</a>	Nanomedicine Research Techniques	

<a href="#">NNMD 5470</a>	Nano/Biomedical Commercialization: Concept to Market	
<a href="#">PHSC 6214</a>	Experimental Design and Biostatistics	

<b>3.1.3 General Principles and Applications Concentration Requirements</b>		<b>SH</b>
<a href="#">CHME 6410</a>	Chemical Engineering Research Methods	2
<a href="#">CHME 7330</a>	Chemical Engineering Thermodynamics	4
or <a href="#">CHME 7350</a>	Transport Phenomena	
<b>Thesis or Project Options</b>		
<b>Complete one of the following options (courses cannot count in multiple categories):</b>		<b>8</b>
<i>Thesis Option</i>		
<b>In addition to completing the thesis course, students must successfully complete the thesis submission process, including securing committee and Graduate School of Engineering signatures and submission of an electronic copy of their MS thesis to ProQuest:</b>		
<a href="#">CHME 7390</a>	Seminar (To be taken simultaneously with Thesis ( <a href="#">CHME 7990</a> ))	
<a href="#">CHME 7945</a>	Master's Project (To be taken prior to Thesis ( <a href="#">CHME 7990</a> ))	
<a href="#">CHME 7990</a>	Thesis	
<a href="#">CHME 7986</a>	Research (confers full-time status if under 8 SH enrollment)	
<a href="#">CHME 7996</a>	Thesis Continuation (similar to CHME 7986, but confers part-time status)	
<i>Project Option</i>		
<a href="#">CHME 7330</a>	Chemical Engineering Thermodynamics	
or <a href="#">CHME 7340</a>	Chemical Engineering Kinetics	
or <a href="#">CHME 7350</a>	Transport Phenomena	
<a href="#">CHME 7945</a>	Master's Project	
<b>Electives Course List</b>		
<b>Complete 12 semester hours from the following (courses cannot count in multiple categories):</b>		<b>12</b>
<a href="#">BIOE 5410</a>	Molecular Bioengineering	
<a href="#">CHEM 5620</a>	Protein Chemistry	
<a href="#">CHEM 5625</a>	Chemistry and Design of Protein Pharmaceuticals	

<a href="#">CHEM 5638</a>	Molecular Modeling	
<a href="#">CHEM 5651</a>	Materials Chemistry of Renewable Energy	
<a href="#">CHEM 5653</a>	Electrochemistry of Renewable Energy Devices	
<a href="#">CHME 5105</a>	Materials Characterization Techniques	
<a href="#">CHME 5137</a>	Computational Modeling in Chemical Engineering	
<a href="#">CHME 5160</a>	Drug Delivery: Engineering Analysis	
<a href="#">CHME 5179</a>	Complex Fluids and Everyday Materials	
<a href="#">CHME 5185</a>	Design of Experiments and Ethical Research (DOEER)	
<a href="#">CHME 5510</a>	Fundamentals in Process Safety Engineering	
<a href="#">CHME 5515</a>	Process Safety Engineering for Biotechnology and Pharmaceutical Industries	
<a href="#">CHME 5621</a>	Electrochemical Engineering	
<a href="#">CHME 5630</a>	Biochemical Engineering	
<a href="#">CHME 5631</a>	Biomaterials Principles and Applications	
<a href="#">CHME 5632</a>	Advanced Topics in Biomaterials	
<a href="#">CHME 5642</a>	Photochemistry Fundamentals and Applications	
<a href="#">CHME 5649</a>	Numerical Strategies and Data Analytics for Chemical Sciences	
<a href="#">CHME 5683</a>	Introduction to Polymer Science	
<a href="#">CHME 7330</a>	Chemical Engineering Thermodynamics	
<a href="#">CHME 7340</a>	Chemical Engineering Kinetics	
<a href="#">CHME 7350</a>	Transport Phenomena	
<a href="#">CHME 7600</a>	Pharmaceutical Engineering I	
<a href="#">CHME 7601</a>	Pharmaceutical Engineering II	
<a href="#">CHME 7973</a>	Special Topics in Chemical Engineering	
<a href="#">EMGT 5220</a>	Engineering Project Management	
<a href="#">EMGT 6225</a>	Economic Decision Making	
<a href="#">EMGT 6305</a>	Financial Management for Engineers	
<a href="#">IE 6200</a>	Engineering Probability and Statistics	
<a href="#">IE 7280</a>	Statistical Methods in Engineering	
<a href="#">IE 7285</a>	Statistical Quality Control	

<a href="#">ME 5620</a>	Fundamentals of Advanced Materials	
<a href="#">NNMD 5270</a>	Foundations in Nanomedicine: Therapeutics	
<a href="#">NNMD 5370</a>	Nanomedicine Research Techniques	
<a href="#">NNMD 5470</a>	Nano/Biomedical Commercialization: Concept to Market	
<a href="#">PHSC 6214</a>	Experimental Design and Biostatistics	

<b>3.1.4 Sustainability Concentration Requirements</b>		<b>SH</b>
<a href="#">CHME 5621</a>	Electrochemical Engineering	4
or <a href="#">CHME 5683</a>	Introduction to Polymer Science	
<a href="#">CHME 6420</a>	Engineering for Chemical Sustainability	2
<b>Sustainability Depth Electives</b>		
<b>Complete two of the following (courses cannot count in multiple categories):</b>		<b>8</b>
<a href="#">CHME 5105</a>	Materials Characterization Techniques	
<a href="#">CHME 5137</a>	Computational Modeling in Chemical Engineering	
<a href="#">CHME 5179</a>	Complex Fluids and Everyday Materials	
<a href="#">CHME 5621</a>	Electrochemical Engineering	
<a href="#">CHME 5683</a>	Introduction to Polymer Science	
<b>Sustainability Breadth Electives</b>		
<b>Complete 12 semester hours from the following (courses cannot count in multiple categories):</b>		<b>12</b>
<a href="#">BIOE 5410</a>	Molecular Bioengineering	
<a href="#">CHEM 5638</a>	Molecular Modeling	
<a href="#">CHEM 5651</a>	Materials Chemistry of Renewable Energy	
<a href="#">CHEM 5653</a>	Electrochemistry of Renewable Energy Devices	
<a href="#">CHME 5105</a>	Materials Characterization Techniques	
<a href="#">CHME 5137</a>	Computational Modeling in Chemical Engineering	
<a href="#">CHME 5160</a>	Drug Delivery: Engineering Analysis	
<a href="#">CHME 5179</a>	Complex Fluids and Everyday Materials	
<a href="#">CHME 5185</a>	Design of Experiments and Ethical Research (DOEER)	

<a href="#">CHME 5510</a>	Fundamentals in Process Safety Engineering	
<a href="#">CHME 5515</a>	Process Safety Engineering for Biotechnology and Pharmaceutical Industries	
<a href="#">CHME 5621</a>	Electrochemical Engineering	
<a href="#">CHME 5630</a>	Biochemical Engineering	
<a href="#">CHME 5631</a>	Biomaterials Principles and Applications	
<a href="#">CHME 5632</a>	Advanced Topics in Biomaterials	
<a href="#">CHME 5642</a>	Photochemistry Fundamentals and Applications	
<a href="#">CHME 5649</a>	Numerical Strategies and Data Analytics for Chemical Sciences	
<a href="#">CHME 5683</a>	Introduction to Polymer Science	
<a href="#">CHME 5699</a>	Special Topics in Chemical Engineering	
<a href="#">CHME 7330</a>	Chemical Engineering Thermodynamics	
<a href="#">CHME 7340</a>	Chemical Engineering Kinetics	
<a href="#">CHME 7350</a>	Transport Phenomena	
<a href="#">CHME 7600</a>	Pharmaceutical Engineering I	
<a href="#">CHME 7601</a>	Pharmaceutical Engineering II	
<a href="#">CHME 7973</a>	Special Topics in Chemical Engineering	
<a href="#">CIVE 5250</a>	Organic Pollutants in the Environment	
<a href="#">CIVE 5260</a>	Environmental Fluid Mechanics	
<a href="#">CIVE 5365</a>	Climate Technologies for Decarbonization, Mitigation, and Adaptation	
<a href="#">CIVE 7251</a>	Environmental Biological Processes	
<a href="#">EMGT 5220</a>	Engineering Project Management	
<a href="#">EMGT 6225</a>	Economic Decision Making	
<a href="#">EMGT 6305</a>	Financial Management for Engineers	
<a href="#">IE 6200</a>	Engineering Probability and Statistics	
<a href="#">IE 7280</a>	Statistical Methods in Engineering	
<a href="#">IE 7285</a>	Statistical Quality Control	
<a href="#">ME 5620</a>	Fundamentals of Advanced Materials	

### 3.2. Thesis Requirements

Once the Thesis Research Advisor is assigned, the ChE MS Student/Advisor Agreement must be completed via DocuSign, available here ([ChE MS Student/Advisor Agreement](#)) and on Canvas. A change in the Thesis Research Advisor requires a [ChE Change of Advisor Agreement](#).

Students must form a Master Thesis Committee consisting of a minimum of three members: the Thesis Research Advisor (who must be a core or affiliated faculty member of the Department of Chemical Engineering), at least two faculty members from the Department, and at least one member from outside the Department. Submit the [Thesis Committee Appointment form](#) via DocuSign (a link is also available on the graduate [Canvas page](#)) the semester before the defense. Any changes to the committee during the defense semester require a petition to the Chemical Engineering Graduate Education Committee, describing the extenuating circumstances.

Once the thesis work is complete, an oral Master Thesis Defense is required to complete the Master of Science program. In addition, students pursuing a Master of Science in Chemical Engineering with thesis must submit an approved written thesis to the Graduate School of Engineering. Follow [the COE website](#) for electronic submission instructions and updates on requirements and deadlines.

In addition to the oral and written thesis, it is recommended that each MS thesis student publish at least one first-author or co-author paper based on their thesis work. The Thesis Research Advisor will determine the type, number, and quality of these publications.

#### 3.2.1 Thesis Timeline

- **The Semester Before Defense:** the student must turn in their [MS Committee Appointment Form](#) via DocuSign.
- **At least one Month Before Defense:** The students must first coordinate with the Academic Coordinator and check Canvas ([Dissertation and Thesis Schedule](#)) to ensure their anticipated date is available, as presentations **cannot** overlap with other CHME defenses. Furthermore, it is the student's responsibility to schedule the oral defense at least one month ahead of time to ensure their committee members can attend. Oral defenses **cannot** be scheduled within *two weeks* of the COE's [MS Thesis/PhD Dissertation Signature Page Deadline](#).
- **At least two weeks** prior to Thesis Defense and oral examination:
  - 1) The thesis student must email electronic PDF copies of the complete thesis, including the annotated Turnitin report with comments, to the advisor, committee members, Department Chair (cc the Special Assistant to the Chair Terry Holden, [t.holden@northeastern.edu](mailto:t.holden@northeastern.edu)), the Associate Director of Master's Programs, and the CHME Academic Coordinator. For guidance on accessing Turnitin and generating the required report, refer to the [procedures and instructions](#) outlined in this guidebook.
  - 2) The MS thesis abstract must be submitted electronically to the Academic Coordinator via Qualtrics [here](#). The abstract should summarize the original research and include additional details such as the name of the dissertation advisor and the names and institutional affiliations of all committee members.

- 3) The Academic Coordinator will announce the defense no later than two weeks before the scheduled date via a calendar invite. This invite will include the MS thesis title, abstract, a flyer with a picture of the student, and the Zoom or Teams link provided by the student. The Dean, College of Engineering Graduate Student Services team, Chemical Engineering (and other) Faculty and Staff, Research Staff, Post Docs, and all Graduate students will be invited to the defense.
- **After the thesis is approved** by the primary advisor and committee, with any necessary revisions completed, the student must send an electronic copy of the final dissertation, along with the Turnitin report, to the Department Chair (cc the Special Assistant to the Chair Terry Holden, [t.holden@northeastern.edu](mailto:t.holden@northeastern.edu)), their advisor, committee members, the Associate Director of Master's Programs, and the Academic Coordinator. This ensures that the final document is on file within the department.

### 3.2.2 Thesis Defense

Virtual participation in the oral presentation is allowed at the discretion of the Thesis Research Advisor. The presentation will be open to the public, including students, faculty, and the thesis student's committee. After the public portion of the oral presentation is complete, the Thesis Committee will further examine the thesis student's work in a closed-door question and answer session.

The final approval of the oral defense requires unanimous consent from the Thesis Committee. The signatures of the committee members, Department Chair, and Associate Dean of the Graduate School on the signature page of the final written thesis indicate that the student has successfully passed the thesis defense and final oral examination.

For the official signature pages, COE thesis requirements, and deadlines for final signed thesis submission, refer to the [COE Graduate School website](#).

## 4. Master of Science in Pharmaceutical Engineering

The Master of Science in Pharmaceutical Engineering is offered jointly by Northeastern University's College of Engineering and Bouvé College of Health Sciences. The program prepares students with a fundamental understanding of pharmaceutical sciences and principles of engineering to develop the depth needed for advanced study of pharmaceutical engineering.

This program is generally pursued by students with a Bachelor of Science in Chemical Engineering or closely allied fields in engineering, sciences, or mathematics. The program was designed in collaboration with the Department of Pharmaceutical Sciences to develop the depth needed for advanced study of pharmaceutical engineering. Students wishing to pursue the master's degree with undergraduate educational backgrounds other than engineering are required to demonstrate completion of mathematics coursework through differential equations or the equivalent to be admitted. Students are advised to work closely with their advisors and instructors to determine the electives that would meet their career goals.

#### 4.1. Course Requirements

Please note that several CHME courses are only offered once per year, so we recommend prioritizing those when class times conflict. A minimum of 32 SHs are required, with a minimum GPA of 3.0.

Complete all courses and requirements listed below unless otherwise indicated.

4.1.1 Core Requirements		Hours
<a href="#">CHME 7600</a>	Pharmaceutical Engineering I	4
<a href="#">CHME 7601</a>	Pharmaceutical Engineering II	4
<a href="#">CHME 7602</a>	Pharmaceutical Engineering Laboratory	2
<a href="#">PHSC 5100</a>	Concepts in Pharmaceutical Science	2
<a href="#">PHSC 5102</a>	Concepts in Pharmaceutical Science 2	2
<a href="#">PHSC 7010</a>	Pharmaceutical Sciences Laboratory	4

4.1.2 Restricted Elective Courses		Hours
<i>At least 3 semester hours of total elective courses are required from pharmaceutical sciences (PHSC, PMST) and from chemical engineering (CHME). These semester hours could come from any elective group, as appropriate.</i>		
4.1.2.1 Regulatory		
<i>Complete 3 semester hours from the following:</i>		3
<a href="#">BIOT 5340</a>	Introduction to Biotherapeutic Approvals	
<a href="#">BIOT 5500</a>	Concepts in Regulatory Science	
<a href="#">BIOT 6320</a>	Design and Development of Biopharmaceuticals	
<a href="#">RGA 6002</a>	Introduction to Regulatory Compliance and Practice	
4.1.2.2 Quality/Statistics		
Complete 4 semester hours from the following:		4
<a href="#">CHME 5185</a>	Design of Experiments and Ethical Research (DOEER)	
<a href="#">IE 6200</a>	Engineering Probability and Statistics	

<a href="#">IE 7280</a>	Statistical Methods in Engineering	
<a href="#">IE 7285</a>	Statistical Quality Control	
<a href="#">PHSC 6214</a>	Experimental Design and Biostatistics	
4.1.2.3 Depth Electives		
Complete 7 semester hours from the following:		7
<a href="#">BIOT 5330</a>	Drug Safety and Immunogenicity	
<a href="#">BIOT 6300</a>	Pharmaceutical Microbiology	
<a href="#">BIOT 6340</a>	Sterile Manufacturing Operations	
<a href="#">BIOT 7250</a>	Advanced Biotechnology Applications Laboratory	
<a href="#">CHME 5101</a>	Fundamentals of Chemical Engineering Analysis	
<a href="#">CHME 5160</a>	Drug Delivery: Engineering Analysis	
<a href="#">CHME 5179</a>	Complex Fluids and Everyday Materials	
<a href="#">CHME 5185</a>	Design of Experiments and Ethical Research (DOEER)	
<a href="#">CHME 5515</a>	Process Safety Engineering for Biotechnology & Pharmaceutical Industries	
<a href="#">CHME 5631</a>	Biomaterials Principles and Applications	
<a href="#">CHME 5632</a>	Advanced Topics in Biomaterials	
<a href="#">CHME 5683</a>	Introduction to Polymer Science	
<a href="#">CHME 7330</a>	Chemical Engineering Thermodynamics	
<a href="#">CHME 7350</a>	Transport Phenomena	
<a href="#">PHSC 5300</a>	Pharmaceutical Biochemistry	
<a href="#">PHSC 5310</a>	Cellular Physiology	
<a href="#">PHSC 5500</a>	Repurposing Drugs for Cancer Immunotherapies	
<a href="#">PHSC 5555</a>	Pharmaceutical Toxicology	
<a href="#">PHSC 5560</a>	Nanotoxicity	
<a href="#">PHSC 5619</a>	Mass Spectrometry in Drug Development	
<a href="#">PMST 6250</a>	Advanced Physical Pharmacy	
<a href="#">PMST 6252</a>	Pharmacokinetics and Drug Metabolism	
<a href="#">PMST 6254</a>	Advanced Drug Delivery Systems	

## 5. The Doctor of Philosophy Degree

### PhD Program Overview

The Department of Chemical Engineering offers a PhD program structured into four stages: Pre-Qualifying, Qualifying, Candidacy, and Completion. Students advance through coursework and research under the guidance of a Dissertation Advisor. Upon meeting [doctoral candidacy requirements](#), students become Doctoral Candidates. To earn the PhD, candidates must successfully defend their dissertation and pass the Final Oral Examination.

The program progresses through the following stages:

- [Stage 1: Pre-Qualifying \(within Year 1\)](#) – Complete core courses, achieve a qualifying GPA that is equivalent to passing a Qualifying Examination, join a research lab and initiate a research project.
- [Stage 2: Qualifying \(spans Years 1 and 2\)](#) – Develop research skills, complete a literature review and research proposal defense, and enter Doctoral Candidacy.
- [Stage 3: Candidacy \(typically begins in year 3 and lasts 2 to 4 years\)](#) – Maintain candidacy status and make consistent research progress, with regular updates to the Dissertation Research Advisor and Dissertation Committee.
- [Stage 4: Completion](#) – Submit and defend the dissertation, completing all PhD requirements.

### 5.1. Course Requirements

Students must complete at least 32 SHs of academic coursework, excluding directed study and undergraduate courses, with up to 2 optional hours for cooperative education and mentoring. Advanced Entry students may reduce this by up to 12 SHs.

At least 24 SHs must be taken at Northeastern University, excluding thesis or dissertation courses.

Required coursework includes all four core courses (16 SH), 4 SH of research, and 4 SH of professional development courses. Students are required to complete their degrees with 8 SH worth of elective courses.

During the summer leading up to the first semester, the Graduate Student Services team will advise new students on their first-semester courses. The Graduate Student Services team will post registration guidance on their [new student information website](#) and will also be available to meet with students virtually. They can be reached [coe-phd-gradadvising@northeastern.edu](mailto:coe-phd-gradadvising@northeastern.edu). The Academic Coordinator and Associate Chair for Graduate Studies will also be available to advise students as needed.

After the first semester, students will work with their Dissertation Research Advisor to plan their course schedule. With advisor approval, they can take any number of course credits up to the semesterly limit

specified in their Graduate Student Stipend Assistantship (SGA) appointment letter without additional financial penalty. Course selections must meet Doctoral Candidacy requirements, including all core courses, 4 SH of research, and the proposal defense.

After achieving Doctoral Candidacy, a student must fulfill the **residence requirement** by completing one full academic year of full-time status. This is confirmed through [CHME 9990](#) and [CHME 9991](#). Additional coursework (excluding dissertation continuation and seminars) may be required during this period.

**Meeting the residence requirement is essential** before proceeding to the Dissertation Defense.

### 5.1.1 Course and Semester Hour Requirements

To reiterate, a minimum of 32 semester hours of academic coursework is required, plus 2 optional semester hours for cooperative education and mentoring in chemical engineering. Directed study credits do not count toward the 32 required semester hours.

5.1.1.1 Core Courses <sup>1</sup>		SH	When Should You Take?
A cumulative 3.250 GPA, with no individual class lower than a B–, is required for the following:			
<a href="#">CHME 7320</a>	Chemical Engineering Mathematics	4	
<i>or</i> <a href="#">ME 6200</a>	<i>Mathematical Methods for Mechanical Engineers 1</i> <sup>2</sup>	4	
<a href="#">CHME 7330</a>	Chemical Engineering Thermodynamics	4	
<a href="#">CHME 7340</a>	Chemical Engineering Kinetics	4	
<a href="#">CHME 7350</a>	Transport Phenomena	4	
5.1.1.2 Professional Development <sup>2</sup>			
<a href="#">CHME 7391</a>	Professional Development and Communication in Chemical Engineering 1	1	Fall, Year 1
<a href="#">CHME 7392</a>	Professional Development and Communication in Chemical Engineering 2	1	Spring, Year 1
<a href="#">CHME 7393</a>	Professional Development and Communication in Chemical Engineering 3	1	Fall, Year 2
<a href="#">CHME 7394</a>	Professional Development and Communication in Chemical Engineering 4	1	Spring, Year 2
<a href="#">CHME 7395</a>	Mentoring in Chemical Engineering	1	Recommended, Optional
<a href="#">ENCP 6100</a>	Introduction to Cooperative Education	1	Recommended, Optional

5.1.1.3 Seminar			
Complete the following (repeatable) course each semester:			
<a href="#">CHME 7390</a>	Seminar <sup>3,4</sup>	0	Every Fall and Spring
5.1.1.4 <a href="#">Research, Candidacy Prep, Dissertation Courses</a>			
<a href="#">CHME 9986</a>	Research	0	Before Proposal Defense/Maintain Fulltime Status
<a href="#">CHME 9984</a>	Research (one enrollment, see for details <a href="#">5.1.2 Research, Candidacy Prep and Dissertation courses</a> ) <sup>3</sup>	4	Semester of Proposal Defense
<a href="#">CHME 8960</a>	Candidacy Preparation (max of two enrollments)	0	Semester of Proposal Defense
<a href="#">CHME 9990</a>	Dissertation Term 1	0	After Proposal/Achieving Candidacy
<a href="#">CHME 9991</a>	Dissertation Term 2	0	After Proposal/Achieving Candidacy
<a href="#">CHME 9996</a>	Dissertation Continuation	0	Until Dissertation Defense/Maintain Fulltime Status
5.1.1.5 Pre-approved Electives			
Complete 8 semester hours. Consult your faculty advisor for acceptable courses:		8	
<a href="#">BIOE 5410</a>	Molecular Bioengineering	4	N/A
<a href="#">CHME 5101</a>	Fundamentals of Chemical Engineering Analysis	4	
<a href="#">CHME 5105</a>	Materials Characterization Techniques	4	
<a href="#">CHME 5137</a>	Computational Modeling in Chemical Engineering	4	
<a href="#">CHME 5160</a>	Drug Delivery: Engineering Analysis	4	
<a href="#">CHME 5179</a>	Complex Fluids and Everyday Materials	4	
<a href="#">CHME 5185</a>	Design of Experiments and Ethical Research (DOEER)	4	

<a href="#">CHME 5510</a>	Fundamentals in Process Safety Engineering	4	
<a href="#">CHME 5520</a>	Process Safety Engineering—Chemical Reactivity, Reliefs, and Hazards Analysis	4	
<a href="#">CHME 5621</a>	Electrochemical Engineering	4	
<a href="#">CHME 5630</a>	Biochemical Engineering	4	
<a href="#">CHME 5631</a>	Biomaterials Principles and Applications	4	
<a href="#">CHME 5632</a>	Advanced Topics in Biomaterials	4	
<a href="#">CHME 5683</a>	Introduction to Polymer Science	4	
<a href="#">CHME 5699</a>	Special Topics in Chemical Engineering	4	
<a href="#">CHME 7600</a>	Pharmaceutical Engineering I	4	
<a href="#">CHME 7601</a>	Pharmaceutical Engineering II	4	
<a href="#">CHME 7602</a>	Pharmaceutical Engineering Laboratory	2	
<a href="#">CHME 7973</a>	Special Topics in Chemical Engineering	1-4	
<a href="#">EMGT 5220</a>	Engineering Project Management	4	
<a href="#">EMGT 6225</a>	Economic Decision Making	4	
<a href="#">EMGT 6305</a>	Financial Management for Engineers	4	
<a href="#">ME 5620</a>	Fundamentals of Advanced Materials	4	
<a href="#">NNMD 5270</a>	Foundations in Nanomedicine: Therapeutics	3	
<a href="#">NNMD 5370</a>	Nanomedicine Research Techniques	3	
<a href="#">NNMD 5470</a>	Nano/Biomedical Commercialization: Concept to Market	3	

<sup>1</sup>[Advanced Entry students](#) may petition out of up to 12 SH of core classes.

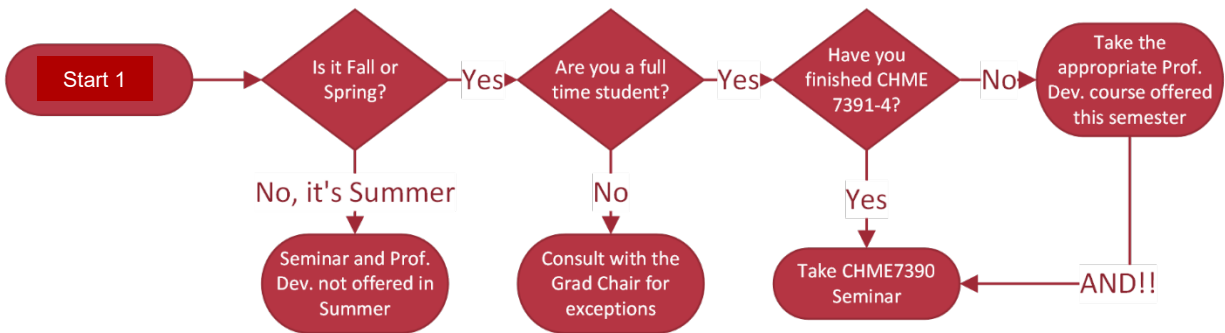
<sup>2</sup> Students may complete ME 6200 during semesters when CHME 7320 is not offered.

<sup>3</sup> Students who began the PhD program before Fall 2019 should consult the university catalog for their entry year at [Northeastern Catalog Archive](#) and COE Graduate Student Services. Key differences include: CHME 7391-4 Professional Development and Communication courses (totaling 4 SHs) are optional, and

CHME 9984 Research (4 SH) is not required. This translates to a lesser total course requirement of 24 SH.  
<sup>4</sup>The Graduate Education Committee may exempt Industry PhD Students working off-campus.

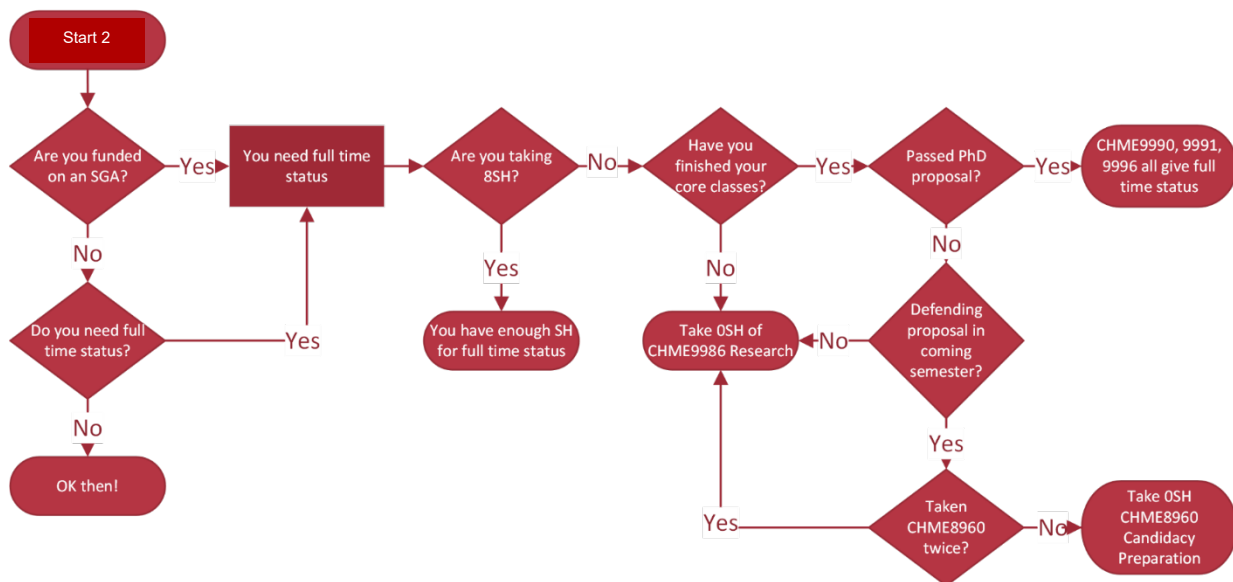
### 5.1.2 Seminar and Professional Development Courses

All students pursuing a Doctoral Degree must enroll in the Department’s seminar course (CHME 7390) for each Fall and Spring semester they are counting toward their degree. There is also a series of four 1-SH Professional Development and Communication courses (CHME 7391–7394) required, with two additional 1-SH courses (ENCP 6100 and CHME 7395) recommended. The typical course sequence is shown in the table above and schematic below.



### 5.1.3 Courses for Maintaining Full-Time Status

To **maintain full-time status**, students must be enrolled in at least 8 SHs of courses. Once a PhD student is no longer taking a full-time course load and before they are ready for the candidacy courses (see section 5.1.4 and the table above), they should register for 0-SH [CHME 9986 Research](#) to maintain full-time



status. Once the candidacy courses and dissertation courses are completed (see section 5.1.4 and the table above), they should register for 0-SH [CHME 9996 Dissertation Continuation](#) to maintain full-time

status. **Please note:** Maintaining full-time status is a legal requirement for international students to retain their visa and for College of Engineering students to receive SGA stipends (RA or TA).

#### 5.1.4 Candidacy Preparation and Dissertation Courses

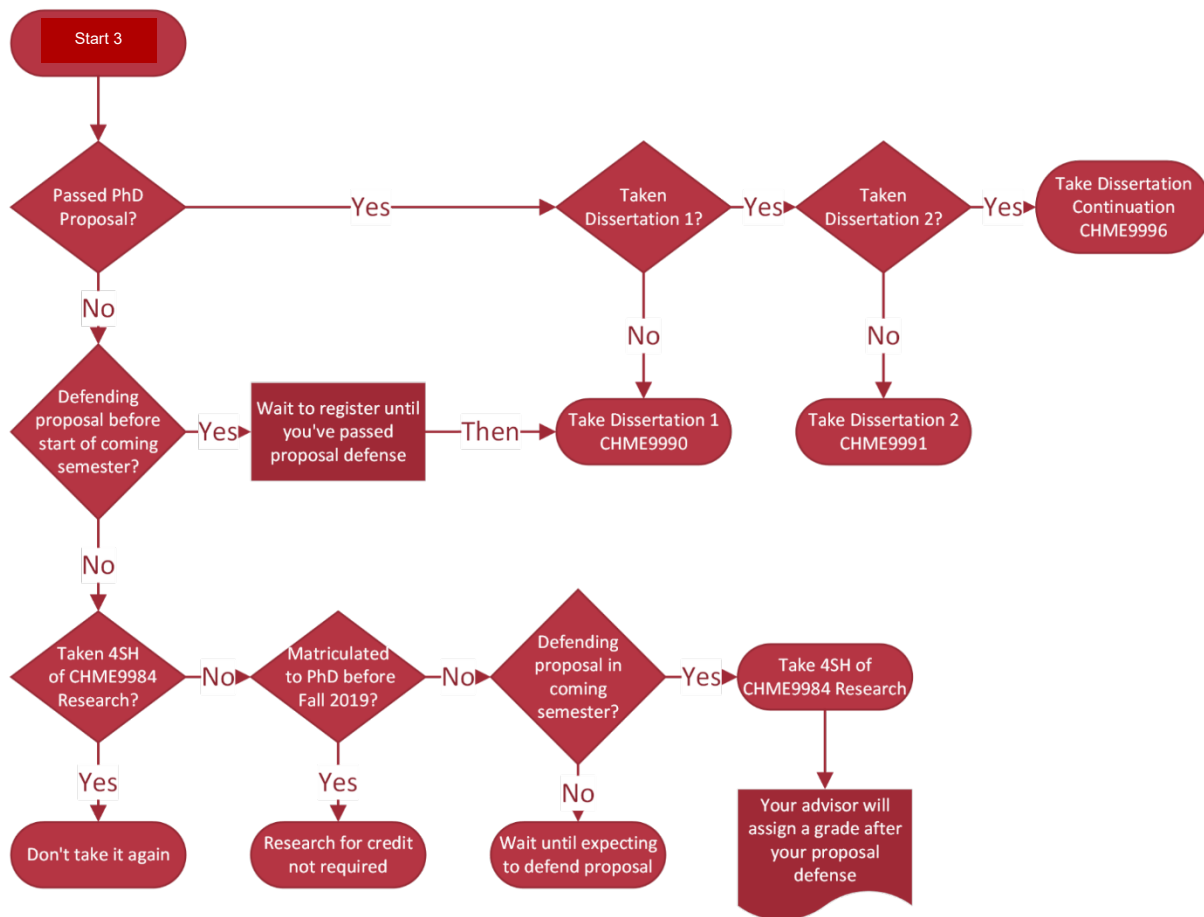
In the semester PhD students plan to defend their proposal, they should enroll in CHME 8960 Candidacy Prep (0 SH) and CHME 9984 Research (4SH) Research. If the goal of the proposal defense is not met, CHME 8960 may be repeated (only once more) for a proposal defense in the subsequent semester. Additionally, the instructor should assign an "IP (In Progress)" grade for CHME 9984 until the proposal is successfully defended.

After successfully defending the proposal and achieving candidacy, the student is required to register for [CHME 9990 Dissertation Term 1](#), followed by [CHME 9991 Dissertation Term 2](#). To register for [CHME 9990 Dissertation Term 1](#), the student must submit their Proposal Approval Form to the Associate Chair for Graduate Studies and the Academic Coordinator in order to have the proposal milestone added to their student record. Important Note: Northeastern University will not allow PhD students to receive their degree without completing [CHME 9990 Dissertation Term 1](#) and [CHME 9991 Dissertation Term 2](#). After these courses are completed, if more time is needed, PhD students must claim their full-time status by enrolling in [CHME 9996 Dissertation Continuation](#) each semester until the dissertation is defended and approved by the Associate Dean of the Graduate School.

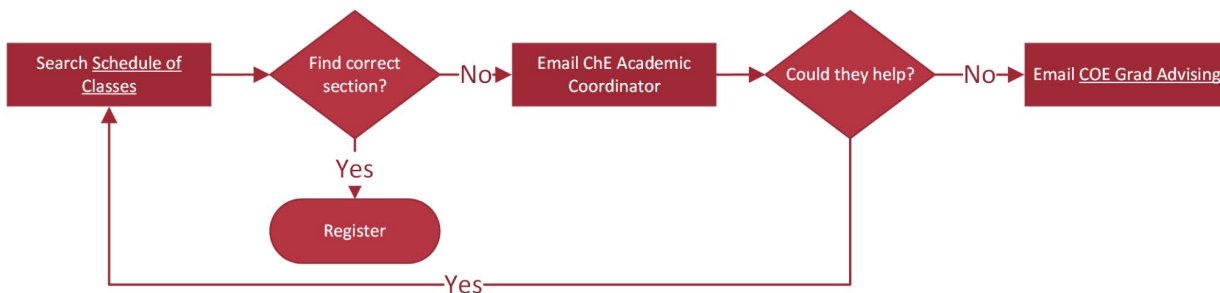
Grading: Students registered for CHME 9984 Research will receive a letter grade at the end of the term. The 0 SH Research and Dissertation courses ([CHME 9990 Dissertation Term 1](#), [CHME 9991 Dissertation Term 2](#), [CHME 9996 Dissertation Continuation](#)) are graded as "S" (Satisfactory) or "U" (Unsatisfactory) based on progress.

#### 5.1.5 Timeline and Registration Instructions for Research Courses

Research Course Timeline for Full-Time Status, Candidacy Prep, and Dissertation Prep	
Timeline	Course Registration
<i>Before Proposal Defense</i>	<a href="#">CHME 9986 Research</a> (0-SH)
<i>Semester of Proposal Defense</i>	<a href="#">CHME 8960 Candidacy Preparation</a> (0-SH) with <a href="#">CHME 9984</a> (4-SH)
<i>After Proposal/Achieving Candidacy</i>	<b>Register sequentially for:</b>
	<a href="#">CHME 9990 Dissertation Term 1</a> (0-SH) <a href="#">CHME 9991 Dissertation Term 2</a> (0-SH)
<i>Until Dissertation Defense</i>	<a href="#">CHME 9996 Dissertation Continuation</a> (0-SH)



To register for research, candidacy preparation, and dissertation courses, students should search the [Schedule of Classes](#) to find the section where their research advisor is listed as the instructor and note the CRN. If a section with the student’s dissertation research advisor is not available for the required semester, the student should contact the Academic Coordinator to have one created. Students must not register for a section with any faculty member who is not their dissertation research advisor.



For more help, ask [coe-chme-gradadvising@northeastern.edu](mailto:coe-chme-gradadvising@northeastern.edu) or [coe-phd-gradadvising@northeastern.edu](mailto:coe-phd-gradadvising@northeastern.edu).

## 5.2. Qualifications for Doctoral Candidacy, and Other Milestones

All PhD students' progress is evaluated in stages. The stages are as follows:

### 5.2.1 Stage 1: Pre-Qualifying Stage

Upon enrollment in the Chemical Engineering doctoral degree program, students enter Stage 1 for their degree. Stage 1, Pre-Qualifying Stage, is the first year of a doctoral degree in Chemical Engineering and has two components: Coursework and Research.

**Coursework** consists of the four core courses for the degree:

- **CHME 7320** (Chemical Engineering Mathematics)
- **CHME 7330** (Chemical Engineering Thermodynamics)
- **CHME 7340** (Chemical Engineering Kinetics)
- **CHME 7350** (Transport Phenomena)

The completion of Stage 1 requires successfully passing the **Qualifying Examination**. The Qualifying Examination for doctoral degree progression in Chemical Engineering requires the PhD student to demonstrate mastery of the four core areas of chemical engineering (Thermodynamics or Statistical Thermodynamics, Kinetics, Transport, and Mathematics). By the end of the first year, students must have completed at least one core course with a grade of B-minus or better. The assessment of mastery is made when the student earns a cumulative 3.250 GPA in these four courses, with no single grade less than a B-minus.

The completion of Stage 1 also requires **Research Progress**, defined as successfully joining a research laboratory and conducting work toward comprehension of the student's new research area, with the help of the new dissertation research advisor.

Progress towards completion of the course- and research-based qualifications for doctoral candidacy will be tracked. At the end of the first year (or at the end of the fall semester of the second year, for a student who took CHME 5101 and CHME 5102 to start their PhD program), the PhD student will receive an **Annual Review** notice from the College of Engineering and the Department of Chemical Engineering indicating the following:

- Feedback from their recently assigned dissertation research advisor.
- Details on current progression through the core courses.
- Comments on performance and progress, including:
  - Successful qualification (or on track) to move to Stage 2.
  - Recommendations if the Doctoral Qualifying Examination was not passed:
    - Dismissal due to insufficient core course GPA and/or lack of research progress.
    - Graduation with a Master's degree if a GPA of 3.0 or higher can be achieved.

- Repetition or completion of specific courses if required.
- Recommendations if student does not secure a permanent research lab:
  - Dismissal from the PhD program.
  - Graduation with a Master's degree.
  - No extension is granted for securing a permanent research lab.

At the end of the second year, for students who were allowed additional time to complete or repeat specific courses, the next issued **Annual Review** feedback will include:

- Feedback from their dissertation research advisor.
- Details on current core course progression status.
- If inability to pass the Doctoral Qualifying Examination persists, the student will receive the following recommendations:
  - Dismissal due to insufficient core and elective semester hours with a GPA of 3.0 or above.
  - Recommendation to graduate with a Master's degree if requirements are met.

### 5.2.2 Stage 2: Qualifying Stage

During Stage 2, students work closely with their research advisors and develop a Committee to aid in their research development. Stage 2 typically lasts one year.

- Students must have successfully completed Stage 1.
- Students must complete Stage 2 by:
  - Earning four (4) semester hours (SH) of Research (CHME 9984) and zero (0) semester hours (SH) of Candidacy Preparation (CHME 8960).
  - Demonstrating critical thinking, analysis, and experimental planning skills in their dissertation research by:
    - Passing an oral defense of a written dissertation research proposal.
    - Acceptance of a literature review in the field of study.

Students earn the classification of **Doctoral Candidate** upon successful completion of Stage 2 requirements. If a student fails to complete the necessary research, literature review, proposal, and oral defense, they may opt to complete an MS degree.

### 5.2.3 Stage 3: Candidacy Stage

- **Duration:** This is the longest stage of the doctoral program.
- **Committee Meetings:** During Stage 3, it is highly recommended that doctoral candidates keep their committee updated on progress through at least yearly meetings.

### 5.2.4 Stage 4: Completion

- **Requirements:** In Stage 4, students must submit a formal copy of their dissertation to the University, which must be accepted by their Committee and the Department.
- **The Department of Chemical Engineering Additional Requirement:**

- The doctoral candidate must conduct a plagiarism check of their own dissertation document and address any highlighted plagiarism questions.
- The Department of Chemical Engineering asks all doctoral students to complete an Exit Survey following their dissertation defense. This survey plays a vital role in helping the Department stay connected with alumni, evaluate the doctoral program, and identify opportunities for continuous improvement to better support future students. Upon successful completion of the defense, students will receive a personalized link to the Exit Survey.

Doctoral Program Stages: Descriptions, Requirements, Outcomes, and Timeframes				
Stage	Description	Requirements	Outcomes	Timeframe
<b>Stage 1: Pre- Qualifying</b>	<ul style="list-style-type: none"> <li>• <b>Components:</b> Core courses, research</li> <li>• <b>Core Courses:</b> Complete four</li> <li>• <b>Research:</b> Progress with advisor guidance</li> </ul>	<ul style="list-style-type: none"> <li>• Core GPA at or above 3.250; no core course grade below B-minus</li> <li>• Join a research lab and secure an advisor</li> </ul>	<ul style="list-style-type: none"> <li>• Annual Review: On track to Stage 2</li> <li>• Annual Review may lead to dismissal, MS degree, or course repetition</li> </ul>	Typically completed in 1 <sup>st</sup> Year
<b>Stage 2: Qualifying</b>	<ul style="list-style-type: none"> <li>• <b>Duration:</b> Typically, 1 year</li> <li>• <b>Components:</b> Develop research skills with advisor and committee guidance</li> </ul>	<ul style="list-style-type: none"> <li>• Register for 4 SH of <b>CHME 9984</b> and 0 SH <b>CHME 8960</b></li> <li>• Pass oral defense of research proposal</li> <li>• Acceptance of literature review</li> </ul>	<ul style="list-style-type: none"> <li>• Successful completion leads to Doctoral Candidacy</li> <li>• Failure may result in an option to complete an MS degree</li> </ul>	Typically completed in 2 <sup>nd</sup> Year
<b>Stage 3: Candidacy</b>	<ul style="list-style-type: none"> <li>• <b>Duration:</b> Longest stage</li> <li>• <b>Expectations:</b> Research progress reports provided to advisor regularly and committee annually</li> </ul>	<ul style="list-style-type: none"> <li>• Register for <b>CHME 9990</b> followed by <b>CHME 9991</b> and then <b>CHME 9996</b></li> </ul>	<ul style="list-style-type: none"> <li>• Progress towards dissertation completion</li> <li>• Complete original, publishable research</li> </ul>	Varies (ranges from 2 to 4 years duration)
<b>Stage 4: Completion</b>	<ul style="list-style-type: none"> <li>• Written and oral dissertation defense to complete the dissertation research project</li> </ul>	<ul style="list-style-type: none"> <li>• Committee and department approval of dissertation</li> <li>• Pass plagiarism check</li> </ul>	<ul style="list-style-type: none"> <li>• Successfully defend and submit dissertation to the College of Engineering</li> <li>• Graduate</li> </ul>	Upon Dissertation Completion

### 5.3. Proposal Defense

The Proposal Defense consists of a written dissertation proposal and an oral defense of that proposal. It is encouraged that the Proposal Defense be completed in the fall or spring, and no later than the summer, of the PhD student's second year. Components of the Dissertation Proposal must include the problem definition, a critical review of the literature, the research goals, a proposed experimental plan, and a

methodology for analysis of results. Note that the Dissertation Proposal does not require any results collected by the student if presented in the second year, although preliminary work performed by the student will enhance the chance of successful proposal defense. Proposals presented in later years are expected to include preliminary results. The content and format of the dissertation proposal document is described in [Appendix A](#).

### 5.3.1 Proposal Defense Timeline

- **The Semester Before Dissertation Proposal Defense:** the student must turn in their [PhD \(Proposal\) Committee Appointment](#) Form via DocuSign. Please read more about the Committee Requirements [here](#).
- **One Month Before Defense of Dissertation Proposal:** The PhD student is responsible for scheduling the oral defense of their proposal at least one month in advance to ensure availability of their faculty advisor and committee members. The defense may be held in-person, virtually, or in a hybrid format, depending on the preferences and availability of the committee. Students must secure a physical or virtual meeting space on their own or with assistance from their advisor. Once a time and format are confirmed, please notify the Academic Coordinator of the date and details.
- **Two weeks Before Proposal Defense:** The PhD student must email electronic PDF copies of the complete dissertation proposal, including the annotated Turnitin report with comments, to the advisor, committee members, the Department Chair (cc the Special Assistant to the Chair Terry Holden, [t.holden@northeastern.edu](mailto:t.holden@northeastern.edu)), the Associate Chair for Graduate Studies, and the ChE Academic Coordinator. For guidance on accessing Turnitin and generating the required report, refer to the [procedures and instructions](#) outlined in this guidebook

The oral presentation of the dissertation proposal will be closed to other students, faculty who are outside of the dissertation committee, and other observers except those specifically invited. In the oral presentation the PhD student must present a clear argument for the proposed work, present a critical literature analysis, defend an experimental plan, and show knowledge of the research topic. The committee gives the final approval on the student's oral defense and will sign a proposal approval form upon successful completion of the Oral Proposal Defense.

Upon approval of the dissertation topic and proposed plan of execution, the student earns the classification of Doctoral Candidate (provided all course requirements are met, as outlined [here](#)). The PhD Proposal Approval Form should be submitted via DocuSign using the link on the graduate Canvas [page](#).

*Failure to submit the Proposal Approval Form will delay the addition of the Candidacy milestone to the student's audit, which is necessary for registering for CHME 9990, maintaining residency and full-time status.*

### 5.3.2. Proposal Defense Considerations

At the Proposal Defense, the committee's aims are two-fold:

- (1) The first aim is to guide the students' research and give helpful comments and suggestions about the ongoing and planned work. The PhD student must pay attention to the committee's suggestions, ask clarifying questions if needed, and take notes. The student may want to follow up with them after the defense.
- (2) The proposal defense also functions as an oral qualifying exam, at which the committee ensures that you meet the high expectations of a Doctoral Candidate. The student must demonstrate critical thinking, analysis, and experimental planning skills related to their dissertation research topic. The student can expect a broad range of questions as the committee probes to determine both the breadth and depth of the student's understanding.

If a student does not pass the Oral Proposal Defense, he or she can choose to petition the faculty. Students may be eligible to retry their defense up to one time. This is at the discretion of the advisor and dissertation committee and will be decided on a case-by-case basis. The student may have the option to graduate with a master's degree.

### 5.4. Proposal and Dissertation Committee Selection

The student is responsible for proposing a dissertation committee to be approved by the Dissertation Advisor and Associate Chair for Graduate Studies. The committee should be **appointed the semester prior to the Oral Proposal Defense, and re-confirmed the semester prior to the Oral Dissertation Defense**, both via forms linked from the graduate [Canvas page](#). The committee must have a minimum of four members, including the primary advisor. At least two committee members must be faculty members in the Department of Chemical Engineering (with a greater than 0% appointment). Additionally, one of the committee members must be external to the Department of Chemical Engineering. The Committee membership is not limited to faculty at Northeastern University, nor to engineering faculty. The student is encouraged to consider experts in the dissertation topic, and to work with the Dissertation Advisor to create a meaningful and helpful committee.

As much as is feasible, the full committee should attend the Oral Proposal Presentation, and all must sign the proposal approval form declaring the student a Doctoral Candidate. Following the Oral Proposal Presentation, the dissertation committee shall be kept informed of the student's progress, and meetings will be held as determined by the student and the advisor, recommended at least once a year.

Committee membership may be changed, with approval of the Dissertation Advisor, at the committee re-confirmation stage that occurs 1 semester prior to the dissertation defense. Changing the dissertation committee membership during the semester of defense requires a petition to the Chemical Engineering Graduate Education Committee describing the extenuating circumstances.

The committee is required to attend the dissertation defense (virtual participation is acceptable as determined by the primary advisor) and will approve the dissertation in its final form.

## 5.5. Dissertation

After degree candidacy has been established, a candidate must complete original, publishable research. Each Doctoral Candidate should have at least 2 archival papers as first authors from their dissertation research (one published before dissertation defense). The PhD dissertation committee will have ultimate authority on the type, number, and quality of these publications.

To be granted the PhD, a candidate must complete a written dissertation, which embodies the results of original research and includes material suitable for publication.

Once the dissertation is defended, the written document must be submitted to the Graduate School of Engineering. The graduate school requirements and electronic submittal instructions can be found [on the COE website](#). Students are responsible for contacting the Graduate School of Engineering for any updates to dissertation requirements and deadlines. The Graduate School of Engineering will publish the approved dissertation once it is submitted upon PhD degree completion.

## 5.6. Dissertation Defense and Final Oral Examination

This comprehensive examination consists of two parts: a public oral dissertation defense followed by a closed-door oral examination. The public presentation covers the doctoral dissertation and its broader context within the field, and is open to all students and faculty across the university, as well as the student's dissertation committee. Immediately afterward, the final oral examination will be held, focusing on the dissertation content and significant developments in the field. This portion is closed to all except the faculty and the student's dissertation committee.

### 5.6.1 Dissertation Defense and Final Examination Timeline

- **The Semester Before Defense:** the student must fill out their [PhD Committee Confirmation Form](#).
- **At least one Month Before Defense:** The students must first coordinate with the Academic Coordinator and check Canvas ([Dissertation and Thesis Schedule](#)) to ensure their anticipated date is available, as presentations **cannot** overlap with other CHME defenses. Furthermore, it is the student's responsibility to ensure the availability of their faculty advisor and other committee members. Oral defenses **cannot** be scheduled within *two weeks* of the COE's [MS Thesis/PhD Dissertation Signature Page Deadline](#).
- **At least two weeks** prior to Dissertation Defense and oral examination:
  - 1) The PhD degree candidate must email electronic PDF copies of the complete dissertation, including the annotated Turnitin report with comments, to the advisor, committee members, the Department Chair (cc the Special Assistant to the Chair Terry Holden,

- [t.holden@northeastern.edu](mailto:t.holden@northeastern.edu)), the Associate Chair for Graduate Studies, and the CHME Academic Coordinator. For guidance on accessing Turnitin and generating the required report, refer to the [procedures and instructions](#) outlined in this guidebook.
- 2) The PhD dissertation digest/abstract must be submitted electronically to the Academic Coordinator via Qualtrics [here](#). The digest/abstract should summarize the original research and include additional details such as the name of the dissertation advisor and the names and institutional affiliations of all committee members.
  - 3) The Academic Coordinator will announce the defense no later than two weeks before the scheduled date via a calendar invite. This invite will include the dissertation's title, abstract, a flyer with a picture of the student, and the Zoom or Teams link provided by the student. The Dean, College of Engineering Graduate Student Services team, Chemical Engineering (and other) Faculty and Staff, Research Staff, Post Docs, and all Graduate students will be invited to the defense.
  - 4) After the dissertation is approved by the primary advisor and any necessary revisions have been made, the candidate must send an electronic copy of the final dissertation, along with the Turnitin report, to the Department Chair (cc the Special Assistant to the Chair Terry Holden, [t.holden@northeastern.edu](mailto:t.holden@northeastern.edu)), their advisor, committee members, the Associate Chair for Graduate Studies, and the Academic Coordinator.

The Dissertation Committee decides on approval of the Dissertation Defense, and approval requires a unanimous decision. The signatures of the committee members and the Department Head, and the Associate Dean, on the signature page of the final written dissertation signifies that the student has passed the dissertation defense and final oral examination. The [signature page](#) (found on the COE Graduate Student Services website) can only be initiated once all revisions have been made, and the final dissertation has been submitted and approved as described in step #4 above.

## 6. Advisor Selection (For Full-Time Graduate Students)

### 6.1. Timeline and Process

**Goal:** To enhance productive mentor-mentee experiences for faculty members and graduate students. This involves fostering mutual development as learners and credible investigators in research, supported by adequate funding. The aim is to set the stage for students to become significant contributors in industry or academia, while also growing the faculty member's research program. To achieve this, **the Department of Chemical Engineering has implemented a two-option process for forming mentor-mentee matches**, ensuring success for both faculty members and students in the long term.

The two options include:

#### 6.1.1 Direct Hiring:

- a) **Timing:** This process occurs during or soon after admission until just before the start of the first semester of student enrollment. After classes start, direct hiring must be approved by the Department before the match.
- b) **Process:** A faculty member and student directly interact with each other on their own initiative, and eventually they jointly determine that they will work together.

- c) **Contract:** From the start of the first semester of enrollment, the faculty member and student enter a 5-year contract, formalized in the admission letter. In this contract, the faculty member is designated as the student's research advisor, dissertation laboratory supervisor, and responsible party for providing a 5-year Research Assistantship (RA) to support the student.

### 6.1.2 Rotation & Matching:

#### **Rotation and Matching Process Update:**

For the 2025–2026 academic year, the Rotation & Matching process described in the below sections will be temporarily modified due to unique circumstances. PhD students are expected to take initiative in arranging one to three lab rotations by contacting faculty directly. Rotation 1 should occur in September, Rotation 2 in October, and Rotation 3 in November. Students may match with a lab after just one rotation if the advisor approves and confirms funding for RA support starting in Summer I or earlier. All students must be matched by the end of the fall semester to begin dissertation research; if not, an extension may be granted. Continued failure to match by the end of spring may result in conversion to a master's program without guaranteed funding.

- a) **Timing:** This rotation and matching process starts soon after admission and continues through to the end of the first semester (Fall semester only) of student enrollment on the PhD program.
- b) **Contract:** The Department of Chemical Engineering and rotation student initially enter a 5-year contract in the form of their admissions letter. The Department provides a 5-year Graduate Student Stipend Assistantship (SGA) as a Teaching Assistantship (TA), Research Assistantship (RA), or fellowships (from the department, university, or outside of the university) to support the student. The Associate Chair for Graduate Studies initially serves as the student's primary advisor for these students. Upon assignment to a faculty member for dissertation research, this 5-year contract continues, with the faculty member taking on the role of primary research advisor and dissertation laboratory supervisor. The faculty member takes on primary responsibility for RA support or becomes the supervisor for the fellowship. The department offers TA support as needed and based on availability. See [ChE PhD Student-Advisor Agreements](#) (For MS details please review Section [6.1.3 For MS Thesis Students](#)). Consequently, see [ChE Change of Advisor Agreement](#) to request any advisor changes.
- c) **Process:**
- i. The student participating in the rotation and matching process will have the opportunity to interact with multiple faculty members in various ways:
    1. Early interaction with a faculty member can begin soon after admission.
    2. At the start of the Fall semester, the Department of Chemical Engineering will provide a list of faculty members for more information on those faculty who are specifically recruiting PhD or MS students into their labs. Students should feel free to contact these faculty members. However, students are encouraged to also reach out to faculty not on this list if they are interested; the list merely serves as a starting point.
    3. A Department of Chemical Engineering Research Showcase in early September allows the student to explore dissertation research opportunities by engaging with faculty, postdocs, and graduate students presenting posters.
    4. Students will be polled to indicate which labs they are interested in rotating through. (Students are advised to reach out to faculty to establish interest, as

rotation placement is not guaranteed.) Furthermore, students will not rank their choices but rather indicate their interests and approach this process with an open mind.

5. From late September to November, the student participates in three [rotation](#) experiences. The rotation assignments are aligned with the student's expressed interest in 3 to 5 faculty members and their laboratories for potential rotations. Since rotation assignments can be limited based on availability, the more faculty members that a new student expresses interest in rotating with, the easier it will be to ensure there are multiple 'choice' assignments. Important Note: The work and interactions that occur during the rotation period are arranged via agreement between the rotation faculty member and the rotation student.
  6. The student is encouraged to proactively explore opportunities in non-rotation labs by scheduling meetings with non-rotation faculty members and their lab members. Students are not limited to joining labs that they rotated in for the final matching.
- ii. Explorations should ideally lead to primary research advisor-student matches and inform future dissertation committee formations. Both faculty members and students are encouraged to present their best efforts.
  - iii. In early December, the student lists potential faculty members and labs for dissertation research support. Open communication with faculty members is encouraged to clarify mutual interest. The student must identify multiple options without ranking them. Faculty members must not request exclusive listing or ranking, as it contradicts the department's process.
  - iv. In early- to mid-December, faculty members will be queried about potential student matches to their research groups during a department meeting. The student's assignment to a dissertation research advisor and their lab will follow a priority order that typically is based on:
    1. Student Interest
    2. New Faculty
    3. New Faculty (2nd recruitment cycle)
    4. Assistant/Pre-tenure (sorted by number of current PhD student mentees)
    5. Tenure in Progress
    6. Associate/Full/Tenured Faculty (sorted by number of current PhD student mentees, with funding considerations)
    7. Affiliated Faculty (must show funds available for 3-4 years, with no TA need)

*Notes: To balance mentoring and funding challenges, a faculty member and their lab may only be assigned more than one new student in a balanced manner. Faculty history as mentors may also be considered.*

- v. In mid- to late-December, the Department of Chemical Engineering will notify the new dissertation research advisor and student pair of their match.
- vi. While rare, a new student may fail to be matched with a research advisor and laboratory. This is often due to insufficient communication between the new student and the faculty members and laboratories in which they express interest. This can also be due to the student not identifying enough options for possible

faculty members and laboratories to match to, which is particularly problematic when multiple students are interested in the same advisor/laboratory. If there is a failure to match, the department will guide the student to revisit or make visits to faculty members with capacity. If the student continues to fail to match, their Chemical Engineering PhD program may be converted to a master's degree program without guaranteed funding.

### 6.1.3 For MS Thesis Students

Unlike PhD students who must follow the processes described above, MS Thesis students are only encouraged to do so. Direct hires for MS Thesis students are rare, and the time constraints of the MS Thesis program may pose challenges for completing the full rotation and matching cycle. However, after matching with a research advisor, the completion of the [ChE MS Student/Advisor Agreement](#) is required. Consequently, the [ChE Change of Advisor Agreement](#) is required in case of any advisor changes.

### 6.1.4 Matching/Rotation Timeline

- Sep 20 – Students Submit Rotation Selections
- Sep 25 – Rotations Announced
- Sep 30 to Oct 18 – Round 1
- Oct 21 to Nov 8 – Round 2
- Nov 11 to Nov 29 – Round 3
- Dec 9 – Deadline Students Submit Advisor Selections
- Dec 9 to Dec 13 – Faculty Meeting on Student-Advisor Matching
- Dec 16 to Dec 20 – Student-Advisor Matches Announced

These dates apply to Fall 2024. *The Fall 2025 timeline will be individually adjusted based on each student's circumstances.*

### 6.1.5 Mentor-Mentee Match Changes and their Consequences

If the **PhD student** and/or their dissertation research advisor decide to break their contract at any point prior to the end of the 5-year period, the faculty member and student should immediately work together to set in motion a plan for one of the following options:

- 1) The student will discontinue the Chemical Engineering PhD program and no longer receive RA support. The department may provide TA support for up to one semester as the student actively seeks a new advisor.
- 2) The student's enrollment in the Chemical Engineering PhD program will be converted to the Chemical Engineering master's degree program, which does not include a funding guarantee. If the student

wishes to pursue a non-Chemical Engineering MS, a new admissions application must be submitted via Slate and an admissions offer is not guaranteed.

- 3) The student's Chemical Engineering PhD program will continue with a new faculty member who agrees to assume the remaining duration of the 5-year research advising and funding contract. The student and new advisor must complete the [ChE Change of Advisor Agreement](#) and a new [ChE PhD Student-Advisor Agreements](#) to initiate this transition (For MS details please see below and also review Section [6.1.3 For MS Thesis Students](#)). Students should note that in the rare case that necessitates a change of Dissertation Advisor, the consequences may include an extended duration of the PhD program for the student and the need for additional funding might not be met due to limited department resources. So, all advisor changes must be approved by the new advisor, the Associate Chair for Graduate Studies, and the Department Chair. Optionally, the current advisor should be included in this process.

Doctoral students who seek to find a new lab must do so prior to their next PhD Student Performance Evaluation (see section 7.2). Any student without a faculty advisor at the time of the PhD Student Performance Evaluation is considered to no longer be in good standing and may be asked to leave the program.

PhD students need to ensure that their plan of action (1, 2, or 3) is pre-approved by the Department of Chemical Engineering (Chair, Associate Chair for Graduate Studies, Academic Coordinator and Business Manager) and by the College of Engineering Graduate Student Services Advising team. If the student does not confirm a plan of action, the department will initiate and implement a plan.

If a **MS thesis student** and their advisor decide to end their relationship, the student must inform the Graduate Education Committee and the Academic Coordinator. Subsequently, there are 2 options:

- 1) They should then seek a new advisor whose research aligns with their interests, completing the official [ChE Change of Advisor Agreement](#) and a new [ChE MS Student/Advisor Agreement](#). It's important to consider how this change may impact the student's timeline, as starting a new thesis could extend their program duration.
- 2) Students are encouraged to consider switching to a course-only MS degree, which may be completed more quickly.

All plans must be pre-approved by the Department of Chemical Engineering (Associate Director of MS Programs and Academic Coordinator) and the College of Engineering Graduate Student Services Advising team; if no plan is confirmed, the department will implement its own plan.

### 6.1.6 Questions for Potential Faculty Advisors

Below are some suggested questions you should ask any advisor you are considering:

- 1) Are you taking on new students in your group?
- 2) Do you have a specific project in mind? If so, is that project currently funded by a research grant?
- 3) What other projects are going on in this group? Are all the students in your group funded?
- 4) Would you be able to support me on a research assistantship or a teaching assistantship or both?
- 5) Are there external fellowship opportunities that you recommend that your graduate students apply for?

- 6) What skills do you expect your students to bring to your lab and what skills do you expect students to develop during their thesis work?
- 7) What are the most important skills to be successful in your group?
- 8) What are your expectations for dissertation or thesis students in terms of workload, progress, and communication?
- 9) How often do you meet with your students 1-on-1?
- 10) Do you have regular lab meetings? Journal club?
- 11) Do you encourage collaboration among your students and with other research groups? If yes, how?
- 12) Do you normally pair a student up with a senior student?
- 13) How big is your group? How many MS, Ph.D., Postdocs?
- 14) How would you describe your mentorship style? How often do you typically meet with your students?
- 15) Are you a 'hands on' advisor? If not, who would I go to for help?
- 16) Can you describe the culture of your research group? How do you foster a supportive environment?
- 17) Can I meet with one of your current grad students?
- 18) What journals does your group normally publish in?
- 19) What conference does your group regularly attend?
- 20) What is your policy on sending students to conferences?
- 21) What are your expectations for graduation for a Ph.D. in terms of research output?
- 22) What is a typical timeline for completing a thesis under your supervision, and what milestones should I expect?
- 23) What careers have your students gone on to after graduation from your research lab?

## **7. Graduate Performance Evaluation**

### **7.1. MS Student Performance Evaluation Process**

MS students in the College of Engineering are routinely assessed for academic progress, with satisfactory performance defined as a cumulative GPA above 3.0. This GPA impacts eligibility for co-op positions, MS-level awards, and other opportunities.

Students with a GPA below 3.0 face consequences. If they fall below this threshold for one term, they must complete an Academic Probation Action Plan, signed by the Associate Director of MS Programs and their College of Engineering Graduate Student Services Advisor, and submit it to the Graduate School of Engineering within 7 business days of the next term. If the GPA remains below 3.0 for two consecutive terms, the student will be dismissed at the end of the second term but can appeal for a final one-term extension. A GPA below 3.0 for three consecutive terms results in automatic dismissal, with the option to appeal to the Associate Dean of the Graduate School of Engineering following university procedures.

### **7.2. PhD Student Performance Evaluation Process**

The College of Engineering and Chemical Engineering Department require that all PhD students undergo an annual evaluation to assess both their academic and research progress. For the PhD students, these evaluations along with official transcripts serve as key documentation for graduate award considerations

and other opportunities. The evaluation process typically occurs during the spring semester and consists of three main components:

- A PhD student self-assessment of their performance for the recent year.
- Feedback from the dissertation research advisor.
- Department review.

#### 7.2.1 Considerations for the PhD Student Self-Assessment Portion of the Evaluation:

- Coursework (including required seminars)
- Awards and honors
- Papers in progress, submitted, or published
- Conferences attended where research results were presented
- Specific target areas for improvement in the next 6 months
- Goals for the next year, including specific project-based goals and personal development goals
- Long-term career goals

#### 7.2.2 Dissertation Research Advisor Feedback:

The Dissertation Research Advisor will rate the PhD student's performance as one of the following:

- **Outstanding:** Log outstanding progress to indicate award-worthy progress; nominate the student for potential departmental, college, or university awards.
- **Good:** Log good progress to indicate strong, above-average progress; take no further action.
- **Satisfactory:** Log satisfactory progress; take no further action.
- **Needs Improvement:** The PhD student must draft a performance improvement plan with input from their primary advisor and, optionally, the rest of their dissertation committee. The final plan must be signed by the student, co-signed and approved by the advisor, and submitted to the Associate Chair for Graduate Studies and the Graduate Education Committee.
- **Unsatisfactory:** Graduate School of Engineering will place the PhD student on probation. A performance improvement plan must be created with input from the student's primary advisor and, optionally, the dissertation committee. The plan must be signed by the student, co-signed and approved by the advisor, and submitted to the Associate Chair for Graduate Studies, the Graduate Education Committee, and College of Engineering Graduate Student Services (via email at [coe-phd-gradadvising@northeastern.edu](mailto:coe-phd-gradadvising@northeastern.edu)). The student is expected to provide a progress update to the Department before reevaluation. Failure to make timely, satisfactory progress may result in loss of funding and dismissal from the program.

Dissertation Research Advisors are also encouraged to provide detailed feedback on the student's research progress, technical skills, professional development, interpersonal skills, and overall PhD progress.

### 7.1.3 Department Review

The Department of Chemical Engineering assesses students' progress according to the department's four stages of PhD progression:

- [Stage 1: Pre-Qualifying Stage](#)
- [Stage 2: Qualifying Stage](#)
- [Stage 3: Candidacy Stage](#)
- [Stage 4: Completion](#)

Ideally, the department will indicate agreement with the Dissertation Research Advisor's **Outstanding, Good, Satisfactory, Needs Improvement, or Unsatisfactory** performance rating. However, since the department considers PhD student progress more holistically (considering course progress, years at each stage of the program, time to graduation, etc.), in some cases the department will provide a modified performance rating.

### 7.1.4 How the PhD Performance Evaluation Results Are Communicated to the Student

The Graduate School of Engineering communicates the PhD Performance Evaluation results to the PhD student. In addition to receiving communication from the college with their results, students may also receive communication from the department to ensure they are aware of their situation and path forward. Both the college and department communications will provide students with unedited copies of the Dissertation Research Advisor performance rating and feedback. The Department Review will also be sent to the PhD student unedited. Needs Improvement and Unsatisfactory performance ratings will trigger subsequent actions by College of Engineering Graduate Student Services and the department, as described above in section 7.2.2.

## 8. Financial Support for Graduate Students

The Chemical Engineering Department and its faculty's goal is to provide financial support for full-time graduate students maintaining satisfactory or better progress for their degree program. However, this goal can never be fully guaranteed. The maintenance of this funding is complex and variable. Sources of funding change, and the responsibilities associated with different funding sources are different. The Department has, therefore, established some guidelines for the most common situations.

### 8.1. Financial Support for Master's Degrees

- Full-time students receiving support from faculty external research grants are required to complete an MS degree with a thesis. However, it's important to note that completing a thesis does not guarantee funding. This is primarily due to the limited number of hours that MS

students are typically available to dedicate to externally funded research projects, making it rare for them to secure such funding. As a result, students should be aware that financial support may not be readily available, and they should explore additional funding options as needed.

- Students pursuing the project-based or course-based MS degree programs (non-thesis options) cannot receive departmental financial support for their degree program.

## 8.2. Financial Support for PhD Degrees

The PhD dissertation research advisor is accountable for securing funding and will make every effort to ensure its availability. In cases where they are unable to do so or in cases where funding ends before completion of the PhD degree, the Department may be able to assist. Students who have successfully earned Doctoral Candidate Status (stage 3 of the PhD student timeline, see section 5.2 above) will be prioritized for consideration for a teaching assistantship (TA). The level of this funding shall be determined by the department based upon the following:

- The availability of departmental funds.
- The student's progress towards their degree.
- The recommendations of the departmental faculty familiar with the student's work.
- The dissertation research advisor and PhD student are continuing to pursue funding from external sources.

## 8.3. Departmentally Supported Students

In some cases, PhD students receive financial support from the department during their first one or two semesters, as specified in their admissions letter. This funding package may include a combination of stipended graduate research or teaching assistantships, as well as fellowships. However, continuation of departmental support for the full duration of the PhD program is not guaranteed. Most PhD students transition away from departmental funding after the first or second semester as they begin to focus on their research under the supervision of a dissertation advisor, ideally securing funding through their advisor's externally funded research grants or through their own fellowships. Continued departmental funding, especially for Teaching Assistantships, is extremely rare. Students will receive notice of their research or teaching assignments prior to each term throughout their PhD program.

PhD students who require departmental support beyond their second semester must have their request and justification submitted by their dissertation research advisor to the Graduate Education Committee. The Department Chair will review this request along with the student's annual PhD Student Evaluation and any available evaluations from previous Teaching Assistantship roles. The Department Chair will inform the dissertation research advisor of the funding decision before notifying the student. If departmental support is denied, the dissertation research advisor may appeal the decision to the Department Chair.

## 9. Guidelines for Students Supported on Stipended Graduate Research or Teaching Assistantships

### 9.1. General

- 1) Graduate students are expected to do their part in creating a community of scholars where the environment enhances effective learning and professional growth. Example actions include but are not limited to: a) taking responsibility for laboratory safety, maintenance, and training of new personnel, b) academically challenging and stretching fellow graduate students and faculty by sharing their own work and questioning other's work for the personal growth of themselves and others, c) seeking expertise within and beyond the Department to achieve research goals, d) continuously pursuing research goals and a deep understanding of both general chemical engineering principles and their specific research area, e) writing conference papers and peer-reviewed publications. For the MS student at least one publication is expected. For a Doctoral Candidate, a minimum of 2 archival papers are recommended.
- 2) All graduate students must attend safety-training and waste management sessions as required by Northeastern University regulations. Training information may be found on the [Office of Academic and Research Safety \(OARS\) website](#).
- 3) Continuation of support for all funded students is dependent upon satisfactory progression toward their degree, as determined by their research advisor, the Graduate Education Committee, and the Department Chair.
- 4) Continuation of support for all funded students also depends on the satisfactory performance of their assigned TA duties and academic work. TAs are evaluated on a semester basis via TA Evaluation forms completed by both the TA and the professor to whom they are assigned; the evaluation is an online form sent to the TA and the professor via email. Evaluation of academic work proceeds as described in [Section 7 Graduate Performance Evaluation](#).
- 5) All funded students (TA, RA, Fellowship, etc.) are expected to be present during undergraduate school vacations and semester breaks to work on their research. Absences will be handled by the specific research advisor, Department Chair, Vice Chair for Undergraduate Education, and/or Associate Chair for Graduate Studies depending on the PhD student's source of stipend funding.
- 6) All students are entitled to 10 business days of vacation a year. Planned vacations must be approved at least one month in advance. RAs require approval from their research advisor. TAs must obtain approval from both their research advisor and the Department Chair or Vice Chair for Undergraduate Education.

### 9.2. Teaching Assistants (TAs)

- 1) TAs will be assigned to specific undergraduate courses on a semester-by-semester basis. Occasionally TAs will be assigned to graduate courses.
- 2) TAs are expected to commit 20 hours per week maximum to their assigned course. This time commitment includes the time dedicated to supporting classroom / laboratory learning, the time required to perform preparatory tasks, etc. Some courses will require TA effort even when school is not in session.
- 3) The TA should report to the professor in charge of their assigned course as early as one week before university classes begin and no later than the day before classes begin.
- 4) TA duties will include such tasks as: assisting the faculty in the conduction of laboratory courses; grading laboratory reports, homework assignments, and exams; and running recitation sessions.

Sometimes TA's may be asked to conduct a lecture without the faculty member in charge, but it is a department practice that TA's will not be used on a regular basis to teach classes.

- 5) It is the responsibility of the TA to be familiar with the course material and with the operation of the course. This will, at a minimum, require close communication with the professor in charge, and may require that the TA attend some or all the lectures/problem sessions. It is the responsibility of the faculty to inform the TA of their specific duties in a timely fashion so that they may be adequately prepared.
- 6) All TAs are expected to be available to students of the class to which they are assigned as a TA. Establishing office hours is recommended.

*Important Note: Classroom availability is limited while there are many TAs hosting office hours each semester. This makes it complicated for staff members of the Department of Chemical Engineering to provide administrative support for finding TAs spaces to hold office hours. Therefore, for individual courses, the faculty member(s) in charge and TAs are expected to be responsible for arranging their own TA office hour spaces. The faculty member(s) have access to 25Live to find classrooms and they can also book rooms such as Cullinane 172 or 205 using Outlook. TAs may use department student spaces in Mugar, spaces in the Snell Library, or spaces in the Curry Student Center. TAs can also utilize the Robin app for booking spaces. Faculty member(s) and TAs should note that it is easier to find space outside of Monday through Friday from 9:15 AM to 4:35 PM.*

- 7) During the semester of the TA assignment, TAs are reminded that they are PhD students and therefore expected to complete their course work and dissertation research in parallel with their TA responsibilities, with research continuing during school breaks as needed. Detailed expectations and strategies for balancing TA, course work, and dissertation research responsibilities should be discussed and communicated on a regular basis with faculty member(s) in charge of the course that TAs are supporting, instructors in charge of the course(s) in which the TA is enrolled as a student, and the dissertation research advisor. TAs are advised to document discussions in writing.

Additional TA expectations as they specifically pertain to the undergraduate or graduate course that the TA supports will be specified in a TA Expectation Form that is completed by the faculty member(s) in charge of the course and approved by the Department Chair. The forms state specific duties, the expected time commitment and other details. The forms also serve as a rubric for TA Performance Evaluations conducted at the end of each semester.

### 9.3. Research Assistants (RAs)

- 1) RAs are required to report to their faculty advisors on the first day of their assignment and encouraged to reach out ahead of the reporting time to plan ahead.
- 2) RAs will be responsible for conducting research related to the project to which they are assigned. The specifics of these duties will be communicated to the student by the research supervisor.
- 3) RAs may be required to work up to 20 hours/week on average on responsibilities not related to their dissertation research, especially if the source of RA funding supports a project that is not related to the dissertation research.
- 4) All RA's are expected to work on their dissertation research during school breaks in alignment with the research work plan and timeline. Time off must be approved by the research supervisor. Time-off requests should be submitted in writing to dissertation research advisors one month in advance.

## 10. Expectations of the Faculty

### 10.1. General Expectations

Students should expect the faculty to be committed to creating a community of scholars where the environment enhances effective learning and professional growth. Actions toward this goal include but are not limited to the following:

- 1) Providing opportunities in core courses for students to develop a graduate-level understanding of chemical engineering principles.
- 2) Challenging and stretching students and each other to achieve high standards of excellence.
- 3) Encouraging students to broaden their knowledge of chemical engineering and develop expertise in research by learning modern technology areas in elective and core courses.

### 10.2. Expectations Related to PhD Dissertation Research Advisement

The following expectations apply to all Chemical Engineering primary, joint, and affiliated faculty who accept and advise doctoral students within the Chemical Engineering PhD program.

- 1) PhD students are expected to consult the graduate guidebook first for program requirements. Advisors should be familiar with the guidebook to provide clarification and guidance when needed. The Academic Coordinator and Associate Chair for Graduate Studies are the next points of contact.
- 2) Research advisors are expected to fund their PhD students, including stipend and tuition, as needed, for the duration of their degree. At least 4 semesters of funding must be demonstrated when matching, but this does not change the expectation of funding for the remainder of the student's training, up to 5 years. After 5 years, student funding is not guaranteed, and any continuation of funding (and any implications for tuition or fees) should be discussed between the student and their research advisor.
- 3) When mentors unexpectedly lack funding, they are expected to use their contacts and resources to secure support for the student. This may include requesting TA lines or exploring internal funding opportunities through departmental or affiliated programs. Responsibility for initiating these requests lies with the advisor.
- 4) Advisors are expected to provide the students with regular feedback on both their research and their academic progress, including support in developing performance improvement plans when needed, to ensure students maintain high standards and graduate in a reasonable timeframe.

Faculty advisors who do not meet these expectations place their current PhD students at risk of funding disruption and jeopardize future PhD student placements or matching to their lab.

### 10.3. Expectations Related to Patents and Confidentiality of Research

New and innovative research may result in patent and secrecy issues. Students should discuss with their faculty advisor issues of confidentiality related to their research area in accordance with the policies of the University. The official Northeastern University patent and intellectual property policy is available in a

separate document, which may be obtained from the Office of Research Management: [Intellectual Property | Office of the General Counsel \(northeastern.edu\)](#)

## **11. Additional Student Resources**

When unsure of who to contact for a specific question, you may reach out to the Academic Coordinator. However, there may be a time when you have a non-academic concern, such as mental health, resources and counseling for international students, or emergency resources. For more information and resources, please see our Graduate Wellbeing Resource Guide available on Canvas on the [Resources for Chemical Engineering Graduate Students](#) page.

## Appendix A: Format of Dissertation Proposal for Doctoral Candidacy

The dissertation proposal will comprise two sections. The first section is a literature review, and the second section is a scientific program proposal. There will inevitably be some overlap and repetition, because a good scientific program proposal includes some background.

### Section 1. Literature Review

The first section will review the scientific and engineering literature of the discipline relating to the proposal in the second section. The specific discipline and scope of the review will be approved by the research advisor.

The purposes of the review include developing your skills at critically evaluating technical publications in historical context, developing scientific writing skills, developing expertise in the discipline, and understanding how to contribute new progress to the discipline. The review creates an understanding of the topic for the readers (committee members), summarizes recent progress in the discipline, and summarizes the current state of knowledge as well as any controversies or gaps in knowledge.

The review comprises a title and four parts.

- 1) Introduction. The introduction motivates the reader's interest, provides an overall "big picture" view of the review, and defines the scope.
- 2) Body. The body concentrates on the primary literature and provides both experimental and theoretical results that shape the current state of the discipline. The results are critically reviewed, controversies or gaps in knowledge are identified. Use figures and/or tables from the original data to support your positions.
- 3) Conclusion and Future Directions. Succinctly summarize your main points. Identify what new work would make progress in the discipline and why such progress is important.
- 4) Literature Cited. Use a *minimum* of 25 sources. Format the literature citations to match the requirements of the proposal section or use a citation style determined by the research advisor.

The Introduction, Body, and Conclusion parts of the review should comprise at least 5 pages of written text (not including figures, tables, equations, and literature cited) and no more than 30 pages of written text. The Literature Cited section is not included in these page limits.

Each page should be single-spaced with 1-inch margins to all borders. Text should be in 12-point font in either Arial, Helvetica, Calibri, Times, or Times New Roman. If in doubt, please also refer to the COE formatting guidelines [here](#).

#### Suggested Resources

- "Ten Simple Rules for Writing a Literature Review". M Pautasso, PLoS Comput Biol 9(7): e1003149, 2013 <https://doi.org/10.1371/journal.pcbi.1003149>
- "Writing Review Papers" the University of Wisconsin-La Crosse, Department of Biology, 2001 <http://websites.uwlax.edu/biology/ReviewPapers.html>

- “How to Write a Mini Literature Review”. M. Ogren-Balkema. From Experimental Molecular Biology: Biotechnology II » Scientific Comm., MIT OpenCourseWare. 2005  
[https://ocw.mit.edu/courses/biology/7-16-experimental-molecular-biology-biotechnology-ii-spring-2005/scientific-comm/lec05\\_mpominirev.pdf](https://ocw.mit.edu/courses/biology/7-16-experimental-molecular-biology-biotechnology-ii-spring-2005/scientific-comm/lec05_mpominirev.pdf)
- “The Elements of Style”, W. Strunk Jr. and E.B. White, Pearson, 1999.

## Section 2. Research Proposal

The second section of the dissertation proposal will consist of a scientific proposal, like the technical portion of a grant application. The proposal must follow the format and guidelines of a U.S. government funding agency, such as the National Institutes of Health (NIH), National Science Foundation (NSF), Department of Commerce, Department of Energy, or Department of Defense. Be sure to consult the specific agency’s proposal guidelines to meet the required criteria. The funding agency and grant type will be selected by the dissertation research advisor and approved by the Dissertation Committee.

The recommended format, even for non-health-related proposals, is that of an NIH R-21 proposal, which includes two brief sections:

- Specific Aims (1 page).
  - State concisely the proposed research project goals and summarize the expected outcome(s), including the impact the results of the proposed research will have on the research field(s) involved.
  - List succinctly the specific objectives of the research proposed (e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop new technology).
- Research Strategy (6 pages, excluding references)
  - Separate sections should describe the: Significance; Innovation; Approach; and Preliminary Studies.
  - See NIH guidance for details of what is meant by each section keyword:  
<https://grants.nih.gov/grants/how-to-apply-application-guide/forms-f/research-forms-f.pdf>

## Guidance for Writing the Dissertation Proposal

Students will gain foundational guidance on writing dissertation proposals in the CHME 7391, CHME 7392, CHME 7393, and CHME 7394 courses. Students can gain additional insight by using [Communications Lab](#) resources, consulting senior students for successful examples, and reviewing published theses and dissertations in their field. When examining completed dissertations, note that the literature review chapter often mirrors what is required for [Section 1. Literature Review](#), to achieve doctoral candidacy. The remaining chapters can offer guidance on structuring [Section 2: Research Proposal](#) effectively. Published Dissertations and Theses can be found on the [Northeastern University Library Digital Repository](#).