



## Graduate Guidebook

Department of Chemical Engineering  
Version 23.09

*"A Community of Scholars"*  
2023-2024

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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 [COE 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 with the Graduate School of Engineering (GSE).

You can reach the Graduate Student Services team at [coe-chme-gradadvising@northeastern.edu](mailto:coe-chme-gradadvising@northeastern.edu).

Questions or suggestions on the content in this guidebook should be directed to the Graduate Committee at [che-grad-committee@coe.neu.edu](mailto:che-grad-committee@coe.neu.edu) or the Graduate Student Coordinator or Associate Chair of Graduate Studies:

Academic Coordinator	Cindy Rinear 201B Cullinane Hall (617) 373-5024 <a href="mailto:c.rinear@northeastern.edu">c.rinear@northeastern.edu</a>
Associate Chair of Graduate Studies	Prof. Eno Ebong 221 ISEC (617) 373 8744 <a href="mailto:e.ebong@northeastern.edu">e.ebong@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, mostly through DocuSign, to the Graduate Academic Coordinator at the Department of Chemical Engineering Main Office for record keeping.

### 1.1. Programs Offered

The Department of Chemical Engineering offers Master of Science (MS) and Doctor of Philosophy (PhD). The Master of Science degree in Chemical Engineering is offered with a thesis (full-time) or a non-thesis (full-time or part-time) option. The Doctor of Philosophy degree in Chemical Engineering is primarily pursued on a full-time basis. In collaboration with the Department of Pharmaceutical Sciences in the Bouve College of Health Sciences, we also offer an MS degree in Pharmaceutical Engineering. The Department of Chemical Engineering also participates in Northeastern University's Experiential Industry PhD Program, which allows qualified individuals to pursue the Doctor of Philosophy degree in Chemical Engineering while working in industry full time.

Full-time MS or PhD students have the option to participate in the Cooperative Education Program, often referred to as Coop. For detailed information on eligibility, requirements, and how to apply, please visit <http://www.coe.neu.edu/co-op-advantage/graduate-co-op>. PhD students and MS students pursuing the thesis option should note that prior to participating in the Cooperative Education Program (Coop), they must obtain approval from their respective advisors.

Both PhD students and full-time Master of Science students pursuing a thesis are able to select thesis topics from a diverse range of faculty research interests. New graduate students can learn about ongoing research topics from individual faculty members, faculty websites, and graduate students' seminars.

### 1.2. Other Options

In pursuit of research and career goals, a student may wish to follow an academic path that varies from the standard programs described in this guidebook. Any deviations from the traditional programs listed above (full-time thesis masters, full-time non-thesis masters, part-time non-thesis masters, full-time dissertation doctorate) must be addressed through petition to the Graduate Committee: [che-grad-committee@coe.neu.edu](mailto:che-grad-committee@coe.neu.edu), and will be considered on a case-by-case basis.

A petition form is available from the College of Engineering (COE) [Graduate Office website](#). The form must be completed by the student, approved by the faculty advisor, and submitted to the Chemical Engineering Graduate Committee through DocuSign. More details can be found on the [GSE website](#).

### 1.3. Departmental GPA Requirements

Per COE rules, all MS and PhD students must have a cumulative GPA (Grade Point Average) greater than or equal to 3.0 to graduate (see [here](#) for more information) and in order to maintain Departmental and College of Engineering (COE) funding. Per Department of Chemical Engineering rules, PhD students are required to achieve a cumulative 3.25 GPA in their core courses, with no individual core grade below a B-minus, before petitioning the department for PhD candidacy. If necessary, provisions for PhD students to repeat courses to increase the GPA may be applied for through petition to the Chemical Engineering Graduate Committee.

### 1.4. Academic Integrity and Data Manipulation

Students are expected to read, understand and follow the Northeastern University [Academic Integrity Policy](#). Northeastern's 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.

You 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 (Assignments section) and must be followed for thesis, proposal, and dissertation submission.

## 2. Coursework

### 2.1. Approved Courses (ChmE MS and PhD)

Refer to the [Online Catalog](#) for current official policies, and the archives at <http://catalog.northeastern.edu/archive/> for policies applying to your year of matriculation. Course requirements are listed by degree in the subsequent sections.

Table 1: Core Courses

<b>Core Chemical Engineering courses</b>		<b>Credits</b>	<b>Typically Offered</b>
CHME 7320	Chemical Engineering Mathematics	4SH	Fall
CHME 7330	Chemical Engineering Thermodynamics (CHME 7235: Statistical Thermodynamics can be substituted for CHME 7330 when offered)	4SH	Fall
CHME 7340	Chemical Engineering Kinetics	4SH	Spring
CHME 7350	Transport Phenomena	4SH	Spring

Table 2: Professional Development Courses

<b>Professional Development courses</b>		<b>Credits</b>	<b>Typically Offered</b>
CHME 7391	Professional Development and Communication in Chemical Engineering 1	1SH	Fall
CHME 7392	Professional Development and Communication in Chemical Engineering 2	1SH	Spring
CHME 7393	Professional Development and Communication in Chemical Engineering 3	1SH	Fall
CHME 7394	Professional Development and Communication in Chemical Engineering 4	1SH	Spring
ENCP 6100	Introduction to Cooperative Education	1SH	

CHME 7395	Mentoring in Chemical Engineering	1SH	Fall
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Table 3: Research Courses

Research courses		Credits	Typically offered
CHME 7390	Seminar (unlimited; required while full-time research student)	0SH	Fall Spring
CHME 7990	MS Thesis (unlimited; 8 SH required to earn MS w/ thesis)	1-4SH	Fall Spring Summer
CHME 7996	MS Thesis Continuation (if needed)	0SH*	Fall Spring Summer
CHME 8960	Candidacy Preparation (take during semester of proposal defense; allowed two enrollments)	0SH*	Fall Spring Summer
CHME 9984	Research (required prior to PhD Candidacy; take during semester of proposal defense)	1-4 SH	Fall Spring Summer
CHME 9986	Research (as needed for full-time status prior to semester of proposal defense; unlimited enrollments)	0SH*	Fall Spring Summer
CHME 9990	PhD Dissertation Term 1 (semester after proposal defense; required)	0SH*	Fall Spring Summer
CHME 9991	PhD Dissertation Term 2 (after CHME 9990; required)	0SH*	Fall Spring Summer
CHME 9996	PhD Dissertation Continuation (after CHME 9991 until dissertation is defended; not required; unlimited enrollments)	0SH*	Fall Spring Summer

\* With the exception of Seminar, these 0SH courses can confer full-time student status for students not carrying a full course load.



Table 4: Pre-approved Elective courses - Many CHME courses are offered every other year for enrollment (marked with \*\*) or irregularly (\*\*\*). Schedule will depend on faculty availability.

Pre-approved <a href="#">Elective courses</a>		Credits	Typically Offered	Last offered
CHME 5101*	Fundamentals of Chemical Engineering Analysis	4SH	Fall	2022
CHME 5105	Materials Characterization Techniques	4SH	Spring	2023
CHME 5137	Computational Modeling in Chemical Engineering	4SH	Fall **	2022
CHME 5160	Drug Delivery: Engineering Analysis	4SH	Spring	2022
CHME 5185	Design of Experiments and Ethical Research (DOEER)	4SH	Spring	2023
CHME 5260	Special Topics in Chemical Engineering	4SH		
CHME 5510	Fundamentals in Process Safety Engineering	4SH	Fall	2022
CHME 5520	Process Safety Engineering	4SH	Spring	2023
CHME 5621	Electrochemical Engineering	4SH	Spring	2023
CHME 5630	Biochemical Engineering	4SH	Fall Spring	2023
CHME 5631	Biomaterials Principles and Applications	4SH	Fall	2022
CHME 5632	Advanced Topics in Biomaterials	4SH	Spring	2023
CHME 5683	Introduction to Polymer Science	4SH	Spring***	2021
CHME 5699	Special Topics in Chemical Engineering	4SH		
CHME 6610	Computational Programs in Process Safety Modeling	4SH	Fall	2022
CHME 6964	Co-op Work Experience	0SH		
CHME 7235	Introduction to Statistical Thermodynamics	4SH		

CHME 7240	Polymer Science	4SH		
CHME 7260	Special Topics in Chemical Engineering	4SH		
CHME 7262	Special Topics in Process Safety	4SH	Spring	2023
ENGR 5670	Sustainable Energy	4SH		
EMGT 5220	Engineering Project Management	4SH		
EMGT 6225	Economic Decision Making	4SH		
BIOE 5410	Molecular Bioengineering	4SH		
ME 5620	Fundamentals of Advanced Materials	4SH		
NNMD 5270	Introduction to Nanomedicine	4SH		
NNMD 5370	Nanomedicine Research Techniques	4SH		
NNMD 5470	Nano/Biomedical Commercialization: Concept to Market	4SH		

\* CHME 5101 is specifically formulated to help students prepare for the rigorous graduate-level Chemical Engineering core courses at Northeastern University. Incoming graduate students might consider taking this class for example if they either: (1) have an undergraduate background outside of Chemical Engineering, (2) haven't been in school for a while, (3) have any reason for wanting to strengthen their understanding and problem-solving prowess in Chemical Engineering analysis. Students who take CHME 5101 can graduate on the same timeline as their peers and won't "fall behind", since it is considered an elective. It is not recommended as an elective for students who have completed their graduate core.

## 2.2. Approved Courses (PharmEng MS)

Please refer to the online [catalog](#) for official policies

Table 5: Core Courses for Pharmaceutical Engineering

Core Pharmaceutical Engineering courses		Credits	Typically Offered
CHME 7600	Pharmaceutical Engineering I	4SH	Fall

CHME 7601	Pharmaceutical Engineering II	4SH	Spring
CHME 7602	Pharmaceutical Engineering Laboratory	2SH	Fall
PHSC 5100	Concepts in Pharmaceutical Science	2SH	Fall Spring
PHSC 5102	Concepts in Pharmaceutical Science 2	2SH	Fall Spring
PHSC 7010	Pharmaceutical Sciences Laboratory	4SH	Fall Spring

**Elective Courses.** Students must take at least 3 semester hours each from PHSC and CHME. These semesters could come from any elective group, as appropriate.

Table 6: Restricted Elective Courses

Regulatory Electives		Credits
Complete 3 semester hours from the following:		
BIOT 5340	Introduction to Biotherapeutic Approvals	3SH
BIOT 5500	Concepts in Regulatory Science	3SH
BIOT 6320	Quality Management Systems and Validation	3SH
RGA 6000	Introduction to Food and Drug Administration (FDA) Pharmaceutical Regulation	2SH
RGA 6002	Introduction to Regulatory Compliance and Practice	2SH
Quality/Statistics		
Complete 4 semester hours from the following:		
CHME 5185	Design of Experiments and Ethical Research (DOEER)	4SH
IE 6200	Engineering Probability and Statistics	4SH
IE 7280	Statistical Methods in Engineering	4SH
IE 7285	Statistical Quality Control	4SH

PHSC 6214	Experimental Design and Biostatistics	2SH
<b>Depth Electives</b>		
Complete 7 semester hours from the following:		
BIOT 5330	Drug Safety and Immunogenicity	3SH
BIOT 6300	Pharmaceutical Microbiology	3SH
BIOT 6340	Sterile Manufacturing Operations	3SH
BIOT 7250	Advanced Biotechnology Applications Laboratory	3SH
CHME 5101	Fundamentals of Chemical Engineering Analysis	4SH
CHME 5160	Drug Delivery: Engineering Analysis	4SH
CHME 5179	Complex Fluids and Everyday Materials	4SH
CHME 5185	Design of Experiments and Ethical Research (DOEER)	4SH
CHME 5631	Biomaterials Principles and Applications	4SH
CHME 5632	Advanced Topics in Biomaterials	4SH
CHME 5683	Introduction to Polymer Science	4SH
CHME 7330	Chemical Engineering Thermodynamics	4SH
CHME 7350	Transport Phenomena	4SH
PHSC 5300	Pharmaceutical Biochemistry	2SH
PHSC 5310	Cellular Physiology	2SH
PHSC 5500	Repurposing Drugs for Cancer Immunotherapies	2SH
PHSC 5555	Pharmaceutical Toxicology	3SH
PHSC 5560	Nanotoxicity	3SH
PHSC 5619	Mass Spectrometry in Drug Development	3SH
PMST 6250	Advanced Physical Pharmacy	2SH
PMST 6252	Pharmacokinetics and Drug Metabolism	3SH
PMST 6254	Advanced Drug Delivery Systems	3SH

## 2.3. 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 in Table 5.

Table 5: Certificate Options

Certificate Options		Credits
<a href="#"><u>Graduate Certificate in Process Safety Engineering</u></a>		16 SH total
CHME 5510	Fundamentals in Process Safety Engineering	4 SH
CHME 5520	Process Safety Engineering - Chemical Reactivity, Reliefs and Hazards Analysis	4 SH
CHME 6610	Computational Programs in Process Safety for Relief and Scenario Modeling	4 SH
CHME 7262	Special Topics in Process Safety	4 SH

<a href="#"><u>Graduate Certificate in Nanomedicine</u></a>		12 SH total
NNMD 5270	Introduction to Nanomedicine	3 SH
NNMD 5272	Nanomedicine Seminar 1	1 SH
NNMD 7274	Nanomedicine Seminar 2	1 SH
NNMD 5470	Nano/Biomedical Commercialization: Concept to Market	3 SH
	A choice of electives from the COE, such as BIOE5100, BIOE7001, CHME5630, CHME7240, CHME7350, ENGR6150.	4 SH

<a href="#"><u>Gordon Institute of Engineering Leadership</u></a>		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	Engineering Leadership Challenge Project 1	4 SH
ENLR 7442	Engineering Leadership Challenge Project 1	4 SH

## 2.4. Other 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 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 Associate Chair of Chemical Engineering 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 rules.
4. If a graduate student wishes to count a graduate course taken under undergraduate status, a petition should be filed with the Chemical Engineering Graduate Committee: [che-grad-committee@coe.neu.edu](mailto:che-grad-committee@coe.neu.edu). In this case, the petition may be made after the course was taken.

## 3. Master of Science Degree (CHME)

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 as an elective in their first semester. They may be required to complete supplementary undergraduate coursework, in addition to the minimum

course requirements. The Department of Chemical Engineering Graduate Committee will specify any additional requirements during the admission process.

Non-thesis MS students are advised by the Chemical Engineering Associate Director of MS Programs and they should work with their faculty advisor to establish the sequence of courses to complete the degree. Master of Science students who undertake thesis research are advised by the Chemical Engineering Associate Director of MS Programs until they have chosen a mutually-agreed upon faculty research advisor, through the advisor selection process, who will supervise their research and advise them on course selection.

Students originally admitted to the Chemical Engineering Master's Program may reapply for admission to the PhD Program, and follow the procedure detailed under the [Administrative Procedure Section](#) for the College of Engineering.

A student is considered full-time if enrolled in a minimum of 8 semester hours of credit, or Thesis Continuation (0SH), PhD Candidacy Preparation (0SH), etc. The COE Graduate School does not require part-time students to maintain any minimum enrollment.

### 3.1. Course Requirements

A minimum of 32 credit hours of academic work is required of all full-time students (continuous and cooperative full-time students) to qualify for the Masters in Chemical Engineering.

If pursuing a thesis option, at least 8 semester hours of CHME 7990 Thesis must be included as part of the 32 semester hours credits. In addition, each student pursuing a thesis option must enroll in the Chemical Engineering Seminar course (CHME 7390) for each semester they are working toward their degree. The faculty advisor and student establish the sequence of courses that students take to pursue the Master of Science in Chemical Engineering.

Full-time Master of Science degree students who complete the required 8 semester hours of thesis work (CHME 7990) but need an additional semester to complete the thesis work are required to register for the 0 semester hour CHME 7986 Research course, UNLESS they are taking enough classes to be considered full time. Note that although this is a 0 semester hour course, tuition is charged at 1 semester hour for the course, and a student registered for this course is considered full-time. This is especially important for international students to maintain their F1 visa status.

If full-time registration status is not needed in the semester following completion of the required 8 semester hours but an additional semester is needed to complete the thesis work, the 0 semester hour CHME 7996 Thesis Continuation course should be registered for. Note that



although this is a 0 semester hour course, tuition is charged at 1 semester hour, and confers half-time registration status.

If pursuing a non-thesis option, students must complete a minimum of 32 SH of coursework; no enrollment in Chemical Engineering Seminar is required, although it is encouraged.

Table 5: Course Requirements for Master of Science Degree (Thesis and Non-Thesis)

Course Requirements	Thesis	Non-Thesis
Required Core Courses	16 SH	16 SH
Master of Science Thesis*	8 SH	N/A
Seminar	0 SH	N/A
Elective Courses**	8 SH	16 SH
Minimum Semester Hours Required***	32 SH	32 SH

\* Thesis CHME 7990 (8 SH), Research CHME 7986 (0 SH, full-time status until thesis is complete) Thesis Continuation CHME 7996 (0 SH, half-time status until thesis is complete).

\*\* Students may complete a maximum of 8 SH (Thesis Option) or 12 SH (Non-Thesis Option) of coursework for credit outside of the Chemical Engineering Department under the guidance of their faculty advisor and approval of the Graduate Coordinator.

\*\*\* Exclusive of any preparatory undergraduate courses.

## 3.2. Thesis Requirements

Students pursuing a Master of Science in Chemical Engineering with thesis must submit to the Graduate School of Engineering a written thesis that is approved by the Thesis Committee and Department Chair. 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 thesis requirements and appropriate deadlines. It is recommended that each MS candidate authors from his/her thesis work at least one paper (first author) for publication. The Thesis Committee will have the ultimate authority on the type, number, and quality of these publications. Thesis MS students must complete an oral Master's Thesis Defense in order to successfully complete the program. The student will be expected to form a Master's Thesis Committee, composed of a minimum of three members, one who is the faculty advisor, at least two of whom are faculty members in the Department of Chemical Engineering, and at least one member from outside of the Department of Chemical Engineering. The primary Thesis Advisor must be a faculty member in or affiliated with the Department of Chemical Engineering. A [Thesis Committee Appointment form](#) is linked from the graduate [Canvas page](#), and must be submitted via DocuSign the semester before the Thesis is presented. To change thesis committee membership during the semester of the defense

requires a petition to the Chemical Engineering Graduate Committee describing the extenuating circumstances.

### 3.2.1 Thesis Timeline

- **The Semester Before Defense:** the student must turn in their [MS Committee Appointment Form](#) via DocuSign.
- **One Month Before Defense:** It is the student's responsibility to schedule the oral defense at least one month ahead of time to ensure full committee attendance. Oral defenses cannot be scheduled within *two weeks* of the COE's [paperwork deadline](#). Student's presentations cannot overlap with other ChemE Theses or Dissertation Defenses. It is advised to schedule at least 3 months in advance to ensure a space on campus. Please schedule early and check with the Academic Coordinator if you are unsure of conflicts.
- **Two weeks Before Defense:** The candidate must submit electronic copies of a complete thesis draft to each thesis committee member and the Department Chair. This thesis draft must include the annotated report from TurnItIn. See the [Procedures for Preventing Plagiarism](#) mentioned below and posted on Canvas for instructions. This document has also detailed instructions on how to submit electronic copies for the TurnItIn report.
- **One week Before Defense:** The candidate must electronically submit to all Chemical Engineering faculty members and graduate students (via the graduate academic coordinator) an abstract that summarizes the original work. Students are asked to note on the abstract the name of their thesis advisor and also the names and affiliations of their committee members. This will be done by completing the [thesis and dissertation survey](#). Early submission will ensure early advertisement.

### 3.2.2 Plagiarism Prevention

Students are required to submit their thesis through TurnItIn. Students should include an annotated version of the TurnItIn report to their committee, the Associate Chair of Graduate Affairs, the Academic Coordinator, and the Department Chair. This is due to the committee the same time as the thesis itself is due: two weeks before the presentation. An updated report of your final version (if changes are made) must be submitted to the Department Chair before they will sign the approval form. Details of the policy and detailed instructions for generating your report are provided on the Canvas site, linked from the [Assignments](#) section.

### 3.2.3 Thesis Defense

Virtual participation of the oral presentation is acceptable as determined by the primary advisor. The oral presentation will be open to the public, including students, faculty, and the candidate's committee. The Thesis Committee and any interested faculty may stay after the public is

dismissed to further examine the candidate's work. The committee gives the final approval on the candidate's oral defense, and the committee decision must be unanimous to approve. The signatures of the committee members, the Department Chair, and the Associate Dean of the Graduate School on the signature page of the final written thesis signifies that the student has passed the thesis defense and final oral examination. The official signature pages, along with COE thesis requirements, and the deadlines for the final signed thesis submission, can be found on the [COE Graduate School website](#).

### 3.3. Part-time Students

Part-time students may progress according to their abilities within the seven-year time limit. A minimum of 32 semester hours of academic coursework is required for part-time students. The thesis and seminar course are not required for part-time students pursuing a non-thesis masters. Details on the time limit between active enrollment periods can be found in the university [catalog](#).

Master of Science students wishing to switch their status from part-time to full-time must notify the Graduate Academic Coordinator and the Department of Chemical Engineering and make a formal petition to the Graduate School of Engineering. Refer to the regulations of the Graduate School of Engineering for further information on academic administrative policies.

### 3.4. Switching from MS to PhD

A student working on their Master's may reapply and be accepted into the PhD program. So long as the student hasn't received their Master's degree, the credits earned while in the Master's program can be transferred to the PhD program. The research credit may be transferred to independent study credits (up to 6SH) but not counted toward the minimum course requirements for the PhD Degree. If a student completes the MS degree, then the 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 communicate their intent to their research advisor as early as possible.

### 3.5. Departure Prior to Thesis Completion

Occasionally, full-time graduate students have left the Department prior to completion of all their degree requirements. In such instances, long time intervals have often elapsed before thesis or manuscript submission. Accordingly, the Department has adopted the guideline that an MS thesis cannot be submitted for a degree beyond three years after the student is no longer actively pursuing the research. Exceptions may be granted only upon petition to the

Departmental Graduate Committee: [che-grad-committee@coe.neu.edu](mailto:che-grad-committee@coe.neu.edu). The petition must demonstrate extenuating circumstances. University time limits and rules also apply.

## 4. The Doctor of Philosophy Degree

The Department of Chemical Engineering offers the degree of Doctor of Philosophy. A Doctoral Student (PhD student) becomes a Doctoral Candidate (PhD Candidate) upon meeting the Qualifications for Doctoral Candidacy ([Section 4.5](#)). After becoming a Doctoral Candidate, a student must complete the required academic coursework and a dissertation under the direction of a Dissertation Advisor. To be granted the degree of Doctor of Philosophy in Chemical Engineering, a candidate must pass a Dissertation Defense and Final Oral Examination.

### 4.1. Course Requirements

- Most students must complete a minimum of 32 semester hours of academic coursework, not including any independent study credits or undergraduate courses, plus 2 optional semester hours for cooperative education and mentoring in chemical engineering. (Advanced Entry students may reduce this by up to 12SH as described below)
- The 32 semester hours must include at least 24 semester hours of academic coursework taken at Northeastern University. This does not include thesis or dissertation courses.
- All four core courses, the 4 SH of research, and the 4 SH of professional development courses must be included in the student's academic graduate coursework.

Students will be advised on their courses for the first semester by the Associate Chair for Graduate Studies during orientation. After the first semester, students will work with their faculty research advisor to determine an appropriate course schedule that meets their educational needs and aspirations. As long as there is agreement with the advisor, a student may take any number of course credits (up to the semesterly limit in their SGA appointment letter) without additional financial penalty. When selecting courses, students and advisors should keep in mind that the requirements for Doctoral Candidacy include successful completion of all four core courses, 4SH research, and the proposal defense. They should also consider that newly appointed Doctoral Candidates must complete a minimum of one full academic year with full-time status to satisfy the residence requirement ([Section 4.4](#)).

Table 6: Course Requirements for Doctor of Philosophy Degree

Course Requirements	Credits
Required Core Courses (required prior to proposal defense)	16 SH **
CHME 7390 Seminar (every fall and spring semester)	0 SH
CHME 7391, CHME 7392, CHME 7393, CHME 7394. Professional Development and Communication in Chemical Engineering 1 – 4.	4 SH
CHME 9986 Research (as needed for full-time status prior to semester of proposal defense; unlimited enrollments)	0 SH
CHME 9984 Research (required prior to PhD Candidacy; take during semester of proposal defense)	4 SH
Elective Courses	8 SH
CHME 8960 Candidacy Preparation (take during semester of proposal defense; allowed two enrollments)	0 SH
CHME 9990 Dissertation Term 1 (semester after proposal defense; required)	0 SH
CHME 9991 Dissertation Term 2 (after CHME 9990; required)	0 SH
CHME 9996 Dissertation Continuation (after CHME 9991 until dissertation is defended; not required; unlimited enrollments)	0 SH
Minimum Semester hours required*	32 SH **

\* Exclusive of any preparatory undergraduate courses, or independent study courses.

\*\* Advanced Entry students may petition out of up to 12 SH of core classes.

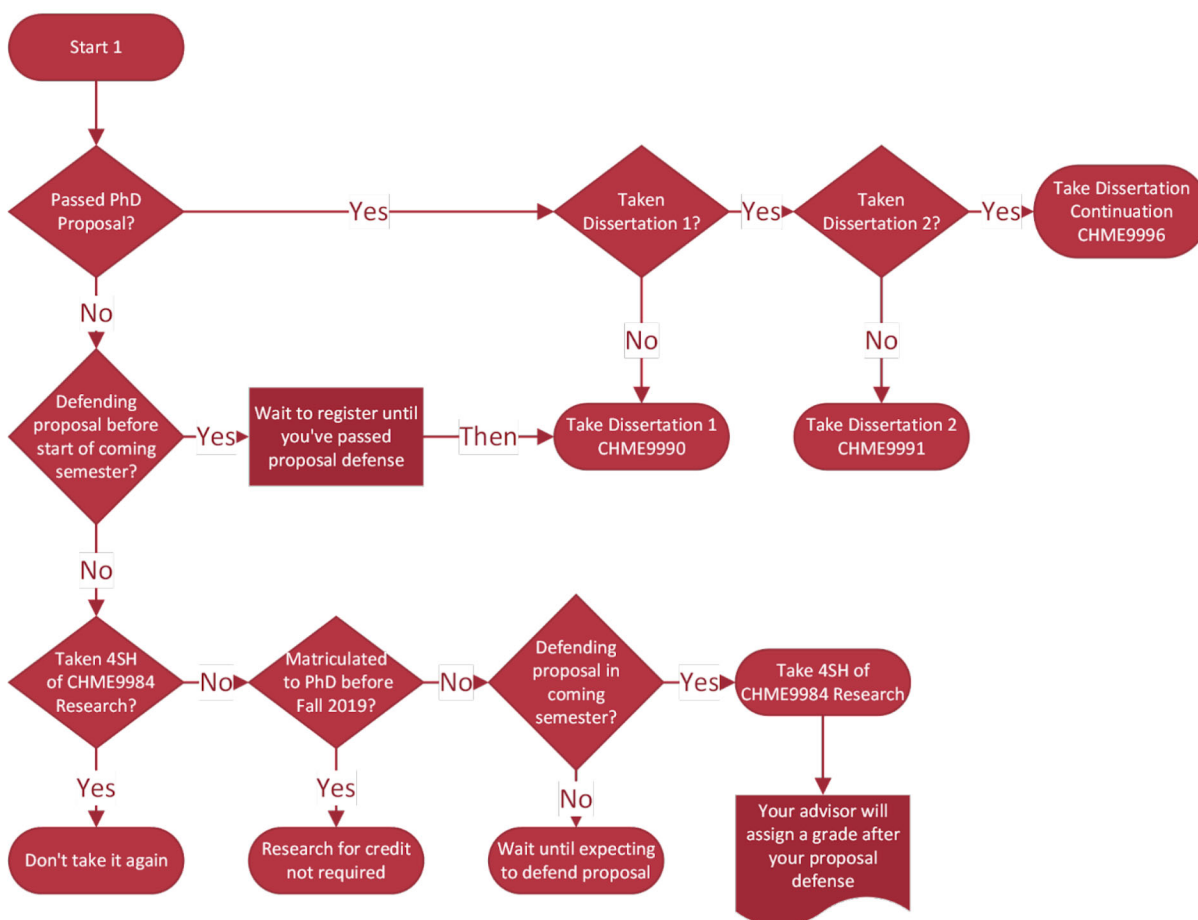
The core classes (Table 1) are required for all graduate degrees in Chemical Engineering, with the exception of PhD students who have already completed a graduate degree in chemical engineering or a closely related discipline and were admitted "Advanced Entry", who must petition the Graduate Committee: [che-grad-committee@coe.neu.edu](mailto:che-grad-committee@coe.neu.edu) and demonstrate that the mastery has been attained through course work either at Northeastern or during a previous graduate degree from another institution (typically granted when the student has achieved a grade of at least A-minus in an equivalent course). The Graduate Committee may require a student to take or retake any or all of the core courses before achieving doctoral candidacy. Incoming "Advanced Entry" students should form a plan of course work in consultation with the associate chair for graduate studies and have this approved by the Graduate Committee. For

the core courses taken at Northeastern, PhD students should maintain a grade-point average (GPA) of 3.250 or above and have no individual core grade below a B-minus.

#### 4.1.1 Advanced Entry

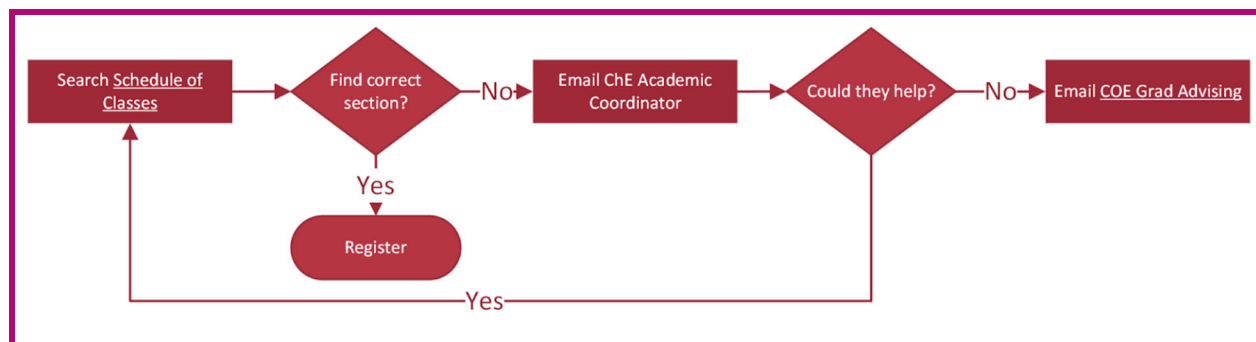
The "Advanced Entry" option for the PhD program offers students the opportunity to waive up to three core courses that they have previously completed, without the need to replace them with elective courses. To qualify for this option, students must demonstrate the successful completion of a relevant Master's degree in a recent time frame, typically within the last 4 years. This ensures the currency of their knowledge in each course they wish to waive. To initiate the Advanced Entry process, students are required to submit an official transcript and their degree completion certificate through the Admissions website prior to the program's start and express their interest to the Academic Coordinator within the first week of the semester following program commencement. It's important to note that students are responsible for filling out a waiver request form, including the syllabus of the completed coursework, proof of completion, and any other necessary supporting documents. The Chair of Graduate Studies will then review the student's request. Please be aware that this process may take some time, and the Academic Coordinator will reach out if further documentation is needed, providing updates on the request's status.

### 4.1.2 Research courses



Once a student is no longer taking a full-time course load, the student should register for (CHME 9986) Research to maintain full-time status. The semester they plan to defend their proposal, they should register for (CHME 8960) Candidacy Preparation, and for 4SH of (CHME 9984) Research. If they miss their goal then (CHME 8960) Candidacy Preparation may be repeated once so that they can defend their proposal the subsequent semester. After successfully defending their proposal and achieving candidacy, they are required to register for (CHME 9990) Dissertation Term 1 followed by (CHME 9991) Dissertation Term 2, followed by (CHME 9996) Dissertation Continuation until the dissertation is defended and approved by the Associate Dean of the Graduate School. Students registered for CHME 9984 Research, will receive a letter grade at the end of the applicable term(s). The 0SH Research and Dissertation courses are graded at the end of each semester as “S” or “U” reflecting whether the student made “satisfactory” or “unsatisfactory” progress on the dissertation/research during the applicable term.

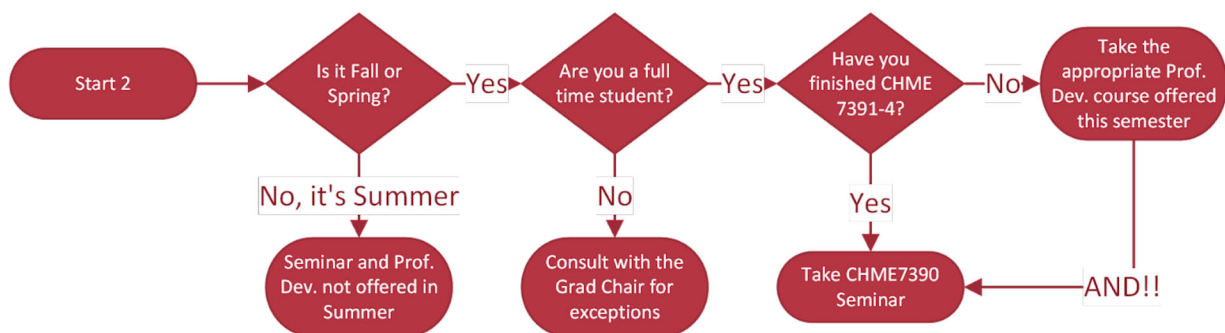




To register for research, candidacy preparation, and dissertation courses, search the [Schedule of Classes](#) to **find the section with your research advisor as the instructor** and note the CRN. If such a section doesn't exist for the required semester, ask the graduate academic coordinator ([Cindy Rinear](#)) to create one.

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

#### 4.1.3 Seminar, Professional Development, and Communication 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. Exemptions for Industrially Sponsored PhD Candidates working off-campus may be granted by the Graduate Committee.

The series of four 1SH Professional Development and Communication courses (CHME 7391–7394) are required, with two additional 1SH courses (ENCP 6100 and CHME 7395) recommended. The typical course sequence for students matriculating in Fall semester is shown in Table 7.



Table 7: Professional Development Courses

Semester and Year	Course	Title	Required
Fall 1	CHME 7391	Prof. Dev. & Commun. in Chem. Eng. 1	Required
Spring 1	CHME 7392	Prof. Dev. & Commun. in Chem. Eng. 2	Required
Fall 2	CHME 7393	Prof. Dev. & Commun. in Chem. Eng. 3	Required
Spring 2	ENCP 6100	Introduction to Cooperative Education	Recommended
Fall 3	CHME 7395	Mentoring in Chemical Engineering	Recommended
Spring 3	CHME 7394	Prof. Dev. & Commun. in Chem. Eng. 4	Required

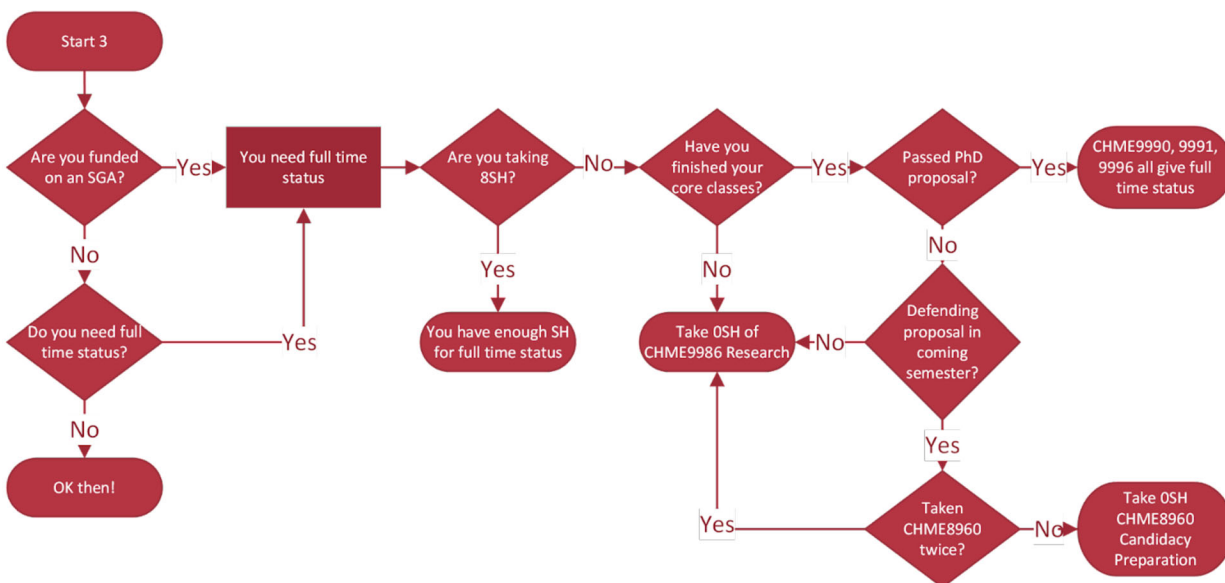
#### 4.1.4 Students who matriculated before 2019

Students who began the PhD program *before* Fall 2019 should refer to the official university catalog of their year of entry at <http://catalog.northeastern.edu/archive> and consult with COE Graduate Student Services. The main differences from the requirements listed above are:

- CHME 7391-4 Professional Development and Communication courses are optional (though the requirement to participate is implicit in the CHME 7390 requirement)
- CHME 9984 Research is not required
- Total course requirement is 24 SH

## 4.2. Maintaining Full-time Status

To maintain full-time status, students must be registered for a minimum of 8 semester hours (SH) of credit, or a special 0SH course that confers full-time status, every semester for the full year. Special 0SH courses that confer full-time status include: CHME 9986, 8960, 9990, 9991, and 9996. During the semesters prior to that of your proposal defense, register for CHME 9986 (Research). For the semester of your proposal defense, register for CHME 8960 (Candidacy Preparation). Following candidacy achievement, sequentially take CHME 9990, 9991, and 9996 (Dissertation and continuation) for the next three semesters. Maintaining a full-time status is a legal requirement for international students to keep their visa status. Full-time status is also required by the College of Engineering to receive an SGA stipend (RA or TA).



### 4.3. Language Requirement

There is no foreign language requirement for the Doctor of Philosophy Degree. The candidate must be proficient in technical writing and oral presentation in the English language. The Chemical Engineering Graduate Committee may require additional coursework to increase a student's English proficiency. Students are encouraged to make use of the "Comm Lab" resources.

### 4.4. Residence Requirement

After successfully becoming a doctoral candidate, a graduate student must complete one full academic year with full-time status to satisfy the residence requirement. Fulfillment of the residence requirement is confirmed through completion of CHME 9990 and CHME 9991. Additional academic course work (exclusive of thesis and seminars) may be required during this period. Completion of the residence requirement is necessary prior to Dissertation Defense.

### 4.5. Qualifications for Doctoral Candidacy

To qualify for doctoral candidacy, the PhD student must demonstrate mastery of four core areas of chemical engineering (Thermodynamics or Statistical Thermodynamics, Kinetics, Transport, and Mathematics) by earning a cumulative 3.250 GPA in these courses, and no single grade less than a B-minus. In addition, the student must complete 4 semester hours (SH) of Research (CHME 9984) for credit, and demonstrate critical thinking, analysis, and experimental planning skills related to their dissertation research topic, as determined by the student's dissertation committee, by passing an oral defense of a written [dissertation research proposal](#). The student earns the classification of Doctoral Candidate upon successful completion of these

requirements. Students failing to meet these requirements for PhD Candidacy can opt to complete an MS degree.

## 4.6. Proposal Defense

The Proposal Defense consists of a written dissertation proposal and an oral defense of that proposal, and is encouraged in the fall or spring of the second year. The student wishing to pursue a doctoral degree must prepare a Dissertation Proposal. This will 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. So, a student's proposal may or may not include preliminary results. The content and format of the dissertation proposal document is described in [Appendix A](#).

### 4.6.1 Proposal Defense Timeline

- **The Semester Before 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:** It is the candidate's responsibility to schedule the oral defense at least one month ahead of time to ensure their faculty advisor and a minimum of 3 other committee members can attend (with at least one being from outside the department, and at least one being from inside the department), for a total of 4 committee members. Please schedule early and let the Graduate Academic Coordinator know your time and date.
- **Two weeks Before Defense:** The candidate must submit electronically a PDF of the Dissertation Proposal to the ChE Academic Coordinator and the Dissertation Committee. This proposal submission must include the report from TurnItIn. See the procedures and instructions linked from the Assignment on [Canvas](#).

The oral presentation of the dissertation proposal will be closed to students, faculty, and other observers except for the student's committee members. In the oral presentation the 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. The PhD Proposal Approval Form should be submitted via DocuSign from the link on the graduate Canvas [page](#).

#### 4.6.2. Proposal Defense Considerations

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

- (1) The first aim is to guide the student's research and give helpful comments and suggestions about the ongoing and planned work. 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.

In the event that the 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 Committee, and will be decided on a case-by-case basis. The student should first contact the Graduate Coordinator to redo the proposal document and oral defense. The student may have the option to graduate with a Masters Degree.

#### 4.7. 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 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.

Committee membership may be changed, with approval of the Dissertation Advisor, up to 1 semester prior to the dissertation defense. To change thesis committee membership during the semester of the defense requires a petition to the Chemical Engineering Graduate Committee describing the extenuating circumstances. The dissertation committee shall be kept informed of the progress of the student and meetings will be held as determined by the student and the advisor, recommended a minimum of once a year. 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. 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.

## 4.8. Change in Dissertation Advisor

Typically, students choose research topics and primary advisors in their first semester. In the rare case that necessitates a change of Dissertation Advisor, the consequences likely include an extended stay for the student and additional funding, and may impact 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 in no less than one year. Any student without a faculty advisor within one year is considered to no longer be in good standing and may be asked to leave the program.

## 4.9. Dissertation

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

In order 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.

### 4.9.1 Plagiarism Prevention

The Department of Chemical Engineering requires that, before the dissertation defense, students upload their dissertation to TurnItIn via the [assignments](#) link on Canvas. TurnItIn will screen the dissertation for possible plagiarism. Students are responsible for removing plagiarism and explaining any remaining matches in an annotated report. Details of the procedure and detailed instructions for generating your report are provided on the Canvas site, linked from the [Assignments](#) section. This report must be shared with the student's committee and the chair at the same time as the thesis itself is due: at least two weeks prior to Dissertation Defense. An updated report of your final version (if changes are made) must be submitted to the Department Chair before they will sign the approval form.

## 4.10. Dissertation Defense and Final Oral Examination

This comprehensive examination includes the oral public dissertation defense as well as a final oral examination to include the subject matter of the doctoral dissertation and significant developments in the field of the dissertation work. The oral presentation will be open to the public, including students, faculty, and the student's committee. Immediately following the public oral presentation, a final oral examination will take place and this will be open only to faculty and the student's dissertation committee.

### 4.10.1 Dissertation Defense and Final Oral Examination Timeline

- **The Semester Before Defense:** the student must fill out their [PhD Committee Confirmation Form](#).
- **One Month Before Defense:** It is the candidate's responsibility to schedule the oral defense at least one month ahead of time to ensure their faculty advisor and a minimum of 3 other committee members can attend (with at least one being from outside the department, and at least one being from inside the department), for a total of 4 committee members. Oral defenses cannot be scheduled within *two weeks* of the COE's [paperwork deadline](#). Student's presentations cannot overlap with other ChemE Theses or Dissertation Defenses, so please schedule early and check with Jacquelyn if you are unsure of conflicts.
- **Two weeks** prior to Dissertation Defense and oral examination, the candidate must:
  1. Submit electronically to the Graduate Academic Coordinator the dissertation digest/abstract that summarizes the original work. Students are asked to note on the digest/abstract the name of their dissertation research advisor and also the names and affiliations of their dissertation committee members.
  2. Announce the agreed upon defense date and time to the public through emails (via the Academic Coordinator). The announcement to the public (including all faculty, students, and committee members) must include the 1- to 2-page abstract of the dissertation; location; day, and time of defense; name of the dissertation research advisor; and names and affiliations of the dissertation committee members. If virtual or hybrid, a link to the virtual meeting space.
  3. Send an electronic copy of the full dissertation (after dissertation is approved by the primary advisor) to the Academic Coordinator to be available to faculty.
  4. Submit electronic copies of the full dissertation to each committee member and the chair of the department. This should include the TurnItIn report.

The Dissertation Committee makes the decision 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.



## 4.11. Departure Prior to Dissertation Completion

Occasionally, graduate students have left the Department prior to completion of all their degree requirements. In such instances, long time intervals have often elapsed before thesis or manuscript submission. Accordingly, the Department has adopted the guideline that a PhD dissertation cannot be submitted for a degree beyond three years after the student is no longer actively pursuing the research. Exceptions may be granted only upon petition to the Department Graduate Committee which a) demonstrates extenuating circumstances, and b) proves that the research is still of value to the profession. Note that the University also has regulations regarding [Time Limitation for Degree Completion](#), and the department policy does not relax those rules.

## 4.12. MS along the way

Some PhD candidates who entered without an MS degree may want to obtain a 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 to discuss the details. This action is possible upon approval of the Graduate Committee.

# 5. 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.

## 5.1 Course Requirements

The course requirements for the MS in Pharmaceutical Engineering are outlined in Section 2.2. Note that several CHME course are only offered once per year, so we recommend prioritizing

those when class times conflict. A minimum of 32 semester hours are required, with a minimum GPA of 3.000.

## 5.2 Full-Time Status

Students must be registered for 8 semester horses per semester to maintain full-time status.

## 5.3 Part-Time Students

Part-time students may progress according to their plans and time constraints but within the seven-year time limit. Master of Science students wishing to change their status 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 regulations of the Graduate School of Engineering for further information on academic administrative policies.

## 5.4 Co-Op

Before going on a Co-op, students need to take the Co-op preparatory course ENCP 6000 or ENCP 6100. If you have further questions, you can reach out to Jake Walker at JW.walker@northeastern.edu.

# 6. Advisor Selection (Full-Time Graduate)

## 6.1. Timeline

PhD students are required to go through lab rotations during their first semester. The rotation is also highly recommended for MS thesis students. Note: Students entering the program after accepting a direct Research Assistant (RA) offer from a Thesis Advisor have already made their commitment and are exempt from this procedure.

Near the start of the semester, students will be polled which labs they are interested in rotate through. It is recommended to reach out to faculty to establish interest, as placement is not guaranteed. Furthermore, students will not rank their choices rather indicate their interests. It is expected to approach this process with an open mind. Regardless of the rotation placement, we encourage you to interview with any faculty member(s) of interest, attend their lab meetings, meet their graduate students, etc. Cultivating interest is encouraged amongst all Grad students, PhD, Thesis and Non-Thesis MS.

Note: While the lab rotation process is mandatory, graduate students are not limited to joining labs that they rotated in for the final matching.



Please review our list of faculty for more information on those looking for PhD or MS students. Students are encouraged to reach out to faculty not on this list if they are interested; this is just a starting point.

**Matching Timeline for Fall 2023, provided for approximate guidance:**

- *September 19*: Rotation Request Form is due.
- *September 25 to October 13*: Rotation 1
- *October 16 to November 3*: Rotation 2
- *November 6 to December 1*: Rotation 3
- *December 1*: Advisor Selection Form due.
- *December 15-19*: Final placements are announced.

2024 dates will be announced once finalized.

## 6.2. 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. What are the most important skills to be successful in your group?
5. Would you be able to support me on research assistantship?
6. How often do you meet with your students 1-on-1?
7. Do you have regular lab meetings? Journal club?
8. Do you normally pair a student up with a senior student?
9. How big is your group? How many MS, Ph.D., Postdocs?
10. Are you a 'hands on' advisor? If not, who would I go to for help?
11. Can I meet with one of your current grad students?
12. What journals does your group normally publish in?
13. What conference does your group regularly attend?
14. What is your policy on sending students to conferences?
15. What are your expectations for graduation for a Ph.D. in terms of research output?

## 7. Graduate Performance Evaluation

The Chemical Engineering Department requires that all graduate students be evaluated bi-annually. The evaluation documents constitute a narrative documentation of a student's progress, in addition to official transcripts, and will be used to assess graduate award evaluations and other opportunities. The summary of the evaluation form can be found in the appendix. The evaluation will typically be done before the end of spring and fall semester. An evaluation will include 1) a self-assessment of performance for the semester, and 2) a face-to-face meeting with the faculty advisor to discuss the performance evaluation.

Non-thesis Master's students are not required to complete a self evaluation, but are encouraged to do so.

While student support is never guaranteed, a satisfactory rating on file is necessary for future support and registration to be approved.

Questions asked of students include:

- If you are a PhD student, you must complete your dissertation proposal within one year of completing your Core Classes. Are you on track with this timeline?
- Coursework (including required seminar)
- Awards and honors
- Papers in progress, submitted and/or published
- Conferences attended where students presented research results.
- Specific target areas for improvement in next 6 months:
- Goals for the next year (specific project based goals as well as personal development goals). If you plan to graduate this year – state your graduation plan:
- What are your long-term career goals?
- Suggestions
- Student Comments

## 8. Financial Support for Graduate Students

It is the goal of the Chemical Engineering Department and its faculty to provide financial support for full-time graduate students maintaining satisfactory progress for the duration of 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. Students Pursuing Master's Degrees

1. Full-time students who are receiving support from faculty external research grants are required to complete an MS Degree with a thesis.
2. Students pursuing the Course MS Degree (non-thesis option) cannot receive departmental or COE financial support.

### 8.2. Students Pursuing the PhD Degree

The PhD advisor is accountable for securing funding and will make every effort to ensure its availability. In cases where they are unable to do so, there are supplementary measures in position to address the situation. Candidates for the PhD Degree funded from external sources may see this funding source end prior to completion of the degree. In order to provide for this event, the Department has adopted the following policies:

1. Students who have successfully earned Doctoral Candidate Status and have their external funding source terminated will be considered for a teaching assistantship (TA). The level of this funding shall be determined by the Graduate Committee and Department Chair based upon the following:

- a) The availability of departmental funds.
- b) The student's progress towards their degree.
- c) The recommendations of the departmental faculty familiar with the student's work.
- d) The PhD advisor making a continuing effort to secure funding for that student from external sources.

### 8.3. Departmentally Supported Students

First year graduate student support will be specified in their admissions letter. Continuation of departmental support is not guaranteed. To provide for equity in its distribution, the Department has adopted the following policy:

All department-supported TA's and non-supported students will be reviewed bi-annually, typically toward the end of fall and spring semester. The Graduate Committee will then recommend support or not, and the level of support, to the Department Chair. If the Graduate Committee and the Department Chair have a difference of opinion they will bring the issue before the entire Chemical Engineering Department. The faculty will be informed of funding decisions prior to student notification. The Faculty Advisor of a student who has lost department support has the right to appeal the decision to the faculty.

Departmental support for the PhD is generally for 3 years beyond the Master's Degree, or 5 years beyond the Bachelor's Degree, and is subject to annual approval by the Graduate Committee and Department Chair. Extension of the general time period must be justified to the Graduate Committee and the Department Chair.

## 9. Guidelines for Supported Students

### 9.1. General

1. All students are entitled to 10 business days of vacation a year. Planned vacation must be approved one month in advance by the Faculty Research Advisor for RAs, and by the Faculty Research Advisor and Department Chair/Vice Chair for Undergraduate Education for TAs.
2. 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 Department Chair and Graduate Coordinator for unassigned TAs and by the specific research Faculty Advisors for RAs and TAs.
3. Continuation of support for all funded students is dependent upon the satisfactory progression toward their degree, as determined by their Faculty Research Advisor and the Department Chair.
4. Continuation of support for all funded students additionally depends upon the satisfactory performance of their assigned duties as well as their academic work. TAs are evaluated on a semester basis via the Graduate Student and TA Evaluation forms (online form sent via email) completed by the professor to whom they are assigned. RA's are evaluated by their Faculty Research Advisor using the Graduate Student Evaluation forms (online form sent via email).
5. All graduate students are required to attend safety-training and waste management sessions as required by Northeastern University regulations. Training information may be found on the [Office of Environmental Health and Safety website](#).
6. 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.

## 9.2. Teaching Assistants (TAs)

1. TAs will be assigned to specific undergraduate courses on a semester-by-semester basis.
2. The TA should report to the professor in charge of their assigned course one week before university classes begin.
3. 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. Occasionally TA's may be asked to conduct a lecture in the absence of the faculty member in charge. It is a Department practice that TA's will not be used on a regular basis to teach classes.
4. 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 of 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.
5. 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.
6. A TA's load is 20 hours/week maximum over the course of the semester spent assisting classroom learning. Some courses will require significant preparation when school is not in session.
7. All TAs are expected to work on their thesis research during semester breaks unless given the time off by their research advisors. Time off requests should be submitted in writing to advisors one month prior to time off.

## 9.3. Research Assistants (RAs)

1. RAs will report to their faculty advisors on the first day of their assignment.
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 faculty advisor.
3. RAs may be required to work up to 20 hours/week on average on responsibilities not directly related to their dissertation research.

4. All RA's are expected to work on their thesis research during semester breaks unless given the time off by their research advisors. Time off requests should be submitted in writing to advisors one month prior to time off.

## 10. Expectations of the Faculty

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 as well as to develop expertise in an area of research by learning new technology areas in elective and core courses.

### 10.1. 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, Cindy Rinear ([j.obrien@northeastern.edu](mailto:j.obrien@northeastern.edu)).

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](#) on Canvas.

## 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 particular 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 first three parts of the review will comprise at least 5 pages of written text (not including figures, tables, equations, and literature cited) but no more than 30 pages total (not including literature cited). Each page will be single-spaced with 1-inch margins to all borders. Text will 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-i-i-spring-2005/scientific-comm/lec05\\_mpominirev.pdf](https://ocw.mit.edu/courses/biology/7-16-experimental-molecular-biology-biotechnology-i-i-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 will comprise a scientific program proposal, much like the technical section of a grant proposal. The format and content of the proposal will be that required by a United States government funding agency, such as the National Institutes of Health, the National Science Foundation, the Department of Commerce, the Department of Energy, or the Department of Defense. Refer to the government agency proposal specifications to fulfill the requirements of the proposal. The selection of the funding agency and grant type used to compose the proposal will be decided by the research advisor and approved by the Dissertation Committee.

The recommended format (even for proposals unrelated to health) is that of an R-21 proposal from the National Institute of Health. This requires two short sections:

- Specific Aims (1 page).
  - State concisely the goals of the proposed research and summarize the expected outcome(s), including the impact that 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 (if appropriate) 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-for-ms-f.pdf>

The ChE Graduate Administration Coordinator (Jacquelyn O'Brien) can provide examples of recent proposals upon request, and the instructor of CHME 7391 or CHME 7392 can provide further guidance.