Each student admitted to the PhD program in chemical engineering will initially be designated a doctoral student. Upon successful completion of the requirements for doctoral candidacy as described below, a student is reclassified as a doctoral candidate. After establishing candidacy, a student must complete a program of academic course work and a dissertation under the direction of a dissertation advisor. All doctoral candidates must also pass a final oral examination.

**Qualifying for Doctoral Candidacy**
To qualify for doctoral candidacy, the student must demonstrate mastery of the four core courses of chemical engineering (thermodynamics, kinetics, transport, and mathematics). To become a doctoral candidate, students must maintain a grade-point average (GPA) of 3.500 or above in the four core courses and have no individual grade below a B in the four core courses.

In addition, each student must also demonstrate critical thinking, analysis, and experimental planning skills related to their dissertation research topic through a written candidacy proposal and an oral defense of this proposal. The student must pass, as determined by the student’s dissertation committee, this oral candidacy proposal defense in order to advance to doctoral candidacy. The oral presentation will be open to students, faculty, and the student’s dissertation committee. The student earns the classification of doctoral candidate upon successful completion of these requirements.

**Course Requirements**
A minimum of 24 semester hours (SH) of academic course work, not including any independent study credits, beyond the bachelor’s degree is required. The 24 SH must include at least 16 SH of academic course work (exclusive of thesis or dissertation) taken at Northeastern University. All four of the core courses (see table under Program Requirements) must be included in the student’s academic graduate course work.

To meet the full-time registration requirement for PhD students who have completed the majority of their course work and not yet reached PhD candidacy, a zero-credit course, Candidacy Preparation—Doctoral (CHME 8960), can be taken if needed to fulfill full-time course registration. The course is an individual instruction course, billed at 1 SH, and graded S or U. There is no course content, and students must register in a section with their research or academic advisor as the “instructor.”

After obtaining PhD candidacy, students are required to register for Dissertation (CHME 9990) for two consecutive semesters. This is then followed by registration for Dissertation Continuation (CHME 9996) in each semester thereafter until the dissertation has been completed and defended. **Note: No course credits are awarded for Dissertation (CHME 9990) or Dissertation Continuation (CHME 9996); however, a student is considered full-time if registered for either of these courses.**

All students pursuing a doctoral degree must enroll in the department’s seminar course for each semester they are working toward their degree.

Students will be advised on their courses for the first semester by the associate chair for graduate studies. After the first semester, students will work with their dissertation advisor to determine appropriate courses and course schedule to meet their educational needs and aspirations. Upon consultation with the dissertation advisor, a student may take up to 44 SH of course credit without additional financial penalty. Students and dissertation advisors should keep in mind that the university residency requirement requires two semesters of academic studies after becoming a doctoral candidate.

**Language Requirement**
There is no foreign language requirement for the PhD degree. However, each candidate must be proficient in technical writing and oral presentation in the English language. The graduate committee may require additional course work to improve language proficiency, if necessary.

**Residence Requirement**
A student satisfies the residence requirement by completing one academic year of full-time graduate studies during two consecutive academic semesters after qualifying for doctoral candidacy. Additional required course work (exclusive of seminars) may be completed during this period. Students are required to be continually enrolled while pursuing the completion of the dissertation.

**Dissertation**
After a student establishes doctoral candidacy, he or she must complete a dissertation that embodies the results of extended original research and includes material suitable for publication. The student is responsible for proposing a dissertation committee to be approved by the dissertation advisor at least one month prior to the dissertation defense. The committee must have a minimum of three members, in addition to the primary advisor. The primary dissertation advisor and at least one other committee member must be faculty members in the Department of Chemical Engineering. Additionally, one of the committee members must be external to the Department of Chemical Engineering. 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. The dissertation committee will approve the dissertation in its final form. The graduate school requirements for dissertation formatting and electronic submittal instructions can be found on the College of Engineering’s webpage (http://www.coe.neu.edu/student-services/dissertation/thesis-instructions). Students are responsible for contacting the Graduate School of Engineering for any updates to dissertation requirements and appropriate deadlines.

**Dissertation Defense and Final Oral Examination**
This comprehensive examination includes the 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.

**Departure Prior to Dissertation Completion**
Occasionally, students have to leave the Department of Chemical Engineering prior to completion of all degree requirements. In such instances, a student cannot submit a dissertation for credit beyond three years after he or she stops actively pursuing the research. Exceptions may be granted upon petition to the departmental graduate committee. Petitions must demonstrate extenuating circumstances and prove that the research is still of value to the profession.
Program Requirements
Complete all courses and requirements listed below unless otherwise indicated.

Milestones
Annual review
Dissertation proposal
Dissertation committee
Dissertation defense

General Requirements
A minimum of 24 semester hours of academic course work is required. Independent study credits do not count toward the 24 required semester hours.

Core
A cumulative 3.500 GPA is required for the core.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHME 7320</td>
<td>Chemical Engineering Mathematics</td>
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</tr>
<tr>
<td>CHME 7330</td>
<td>Chemical Engineering Thermodynamics</td>
<td>4</td>
</tr>
<tr>
<td>CHME 7340</td>
<td>Chemical Engineering Kinetics</td>
<td>4</td>
</tr>
<tr>
<td>CHME 7350</td>
<td>Transport Phenomena</td>
<td>4</td>
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Seminar
Must be taken each semester:

<table>
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<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHME 7390</td>
<td>Seminar</td>
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</tbody>
</table>

Electives
Requires 8 semester hours. Consult your faculty advisor for acceptable courses.

Dissertation
Complete the following (repeatable) course twice:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHME 9990</td>
<td>Dissertation</td>
<td></td>
</tr>
</tbody>
</table>

Program Credit/GPA Requirements
24 total semester hours required
Minimum 3.000 GPA required