

# Ph.D. in Chemical Engineering

## Degree Requirements

To graduate, students must have an approved dissertation and attain an overall GPA of at least 3.0. Students need always to get departmental approval for the courses they take for their degree requirements.

### Ph.D. in Chemical Engineering (students with master's in chemical engineering)

Code	Title	Credits
<b>Electives</b>		
700-level courses		12
<b>Dissertation</b>		
CHE 790A Doct Dissertation & Res <sup>2</sup>		
<b>Seminar</b>		
CHE 791	Graduate Seminar <sup>3</sup>	0
<b>Total Credits</b>		<b>12</b>

<sup>1</sup> No more than 6 credits may be CHE 705 Independent Study. No more than 3 credits in CHE 705 Independent Study may be taken with the same supervising faculty member. The supervising faculty member may never be the student's dissertation advisor. 700-level courses may be substituted by 600-level courses if the academic advisor appeals on behalf of the student to the Office of Graduate Studies and receives approval.

<sup>2</sup> Ph.D. students who pass the Qualifying Examination (QE) must then register for 3 credits of pre-doctoral research (CHE 792 Pre-Doctoral Research) per semester until they defend successfully the dissertation proposal. Ph.D. students who defend the dissertation proposal successfully must then register for the 1-credit dissertation course (CHE 790A Doct Dissertation & Res) each semester until they complete all degree requirements. Students may take courses simultaneously with the 790 or 792 course as per Ph.D. program guidelines or dissertation committee recommendation.

<sup>3</sup> Students must register every semester for this seminar. Part-time students may request that this requirement be waived for some semesters.

### Ph.D. in Chemical Engineering (students without master's in chemical engineering)

Code	Title	Credits
<b>Required Courses <sup>1</sup></b>		
CHE 611	Thermodynamics	3
CHE 612	Kinetics of Reactions and Reactor Design	3
CHE 624	Transport Phenomena I	3
CHE 626	Mathematical Methods in Chemical Engineering	3
<b>Electives</b>		
700-level chemical engineering or chemistry courses		6
700-level courses <sup>2</sup>		6
Electives		12
<b>Dissertation</b>		
CHE 790A Doct Dissertation & Res <sup>3</sup>		
<b>Seminar</b>		
CHE 791	Graduate Seminar <sup>4</sup>	0
<b>Total Credits</b>		<b>36</b>

<sup>1</sup> Must attain a minimum GPA of 3.0 in the required courses.

<sup>2</sup> No more than 6 credits may be CHE 705 Independent Study. No more than 3 credits in CHE 705 Independent Study may be taken with the same supervising faculty member. The supervising faculty member may never be the student's dissertation advisor. 700-level courses may be substituted by 600-level courses if the academic advisor appeals on behalf of the student to the Office of Graduate Studies and receives approval.

<sup>3</sup> Ph.D. students who pass the Qualifying Examination (QE) must then register for 3 credits of pre-doctoral research (CHE 792 Pre-Doctoral Research) per semester until they defend successfully the dissertation proposal. Ph.D. students who defend the dissertation proposal successfully must then register for the 1-credit dissertation course (CHE 790A Doct Dissertation & Res) each semester until they complete all degree requirements. Students may take courses simultaneously with the 790A or 792 course as per Ph.D. program guidelines or dissertation committee recommendation.

<sup>4</sup> Students must register every semester for this seminar. Part-time students may request that this requirement be waived for some semesters.

## Selection of Dissertation Advisor

Students must select a dissertation topic and advisor within 6 months of joining the program. Before making a decision, students should discuss research topics with at least five faculty members of the department and get their signature on a form provided by the department. The signed form with the names of advisors selected must be returned to the department for further processing. Advisors are assigned based on student preferences and availability of funding. Change of advisor requires consent of the previous advisor and departmental approval. In cases where more than one advisor is directing the dissertation, the primary advisor must be on the departmental faculty.

## Qualifying Examination

All PhD candidates must pass a qualifying examination. Students must take the examination by the end of the second semester after enrolling in the PhD program. If repeated examination is necessary, the examination must be passed by the end of the third semester after enrolling in the PhD program.

### ***Pre-requisites for the qualifying examination:***

- Average grade of 3.5 for all four core courses and a minimum grade B in each of the core courses taken at NJIT
  - Equivalent grade for the same subject course based on the MS transcript from an institution other than NJIT may be acceptable, as decided by the Graduate Studies Committee
  - Students whose subject courses differ from those offered at NJIT, so that their MS transcript grades are not deemed acceptable as equivalent to the NJIT core courses by the Graduate Studies Committee are required to take final examinations for each of the core courses during their first two semesters after enrolling into PhD program to satisfy the present requirement.
- A student can take the final examination in each core course up to two times to satisfy the present requirement.
- Failing the present requirement is equivalent to the failing the qualifying examination.

### ***Qualifying examination format***

The examination is administered by an Examination Committee including at least three members of the CBPE graduate faculty. The Examination Committee is appointed by the Graduate Studies Committee each semester. The Examination Committee does not include the student's current or potential PhD thesis adviser.

Three months before the examination date, an assignment is given to a student to prepare for the qualifying examination. The assignment is given by the student's current or potential PhD thesis adviser in coordination with Examination Committee. The assignment identifies a research topic to be addressed in two parts of the examination:

- A written paper, comprising a literature review (no longer than 20 pages excluding references; 12 pts font, double spaced) on the identified research topic. The review needs to
  - Identify an open research problem,
  - Outline state of the art, and
  - Propose an approach for future research in this area.
  - If pertinent, results of preliminary work may be included.

- An oral presentation no longer than 20 min, followed by questions. The presentation will be open to the public; committee deliberations following the presentations will be restricted to the committee members only.

The result of the examination is determined by the Examination Committee based on the review of the written paper, oral examination, and feedback from the current or potential PhD thesis adviser.

A student is allowed to repeat the qualifying examination only once.

## Formation of Dissertation Committee

Within three months of passing the qualifying examination, doctoral students must form a dissertation committee. The department provides a special form. The signed form must be submitted for the approval of the Associate Chair for Graduate Studies in Chemical Engineering. The committee must consist of the doctoral student's dissertation advisor, three additional faculty members from the department, which include the faculty members with joint appointments in the department of Chemical and Materials Engineering, and one member from outside the department (preferably outside the university). The committee may consist of more than five persons, subject to the approval of the Associate Chair. Once formed, the committee cannot

change unless there is a written explanation and request from the doctoral student and/or his/her advisor. The Associate Chair for Graduate Studies handles such requests.

## **Research Proposal**

Within six months of forming the dissertation committee (i.e., no more than nine months after passing the qualifying examination), doctoral students must make an oral presentation to their dissertation committee and other interested persons on the scope of their proposed research. The committee must formally approve the proposal within a maximum of three additional months. This ensures meeting the requirements that doctoral students must have an approved dissertation committee and an approved dissertation proposal within a year of passing the qualifying examination. The approved and signed proposal must be submitted to the Associate Chair for Graduate Studies so that it is kept in the student's file.

## **Dissertation Defense**

An oral defense of the dissertation is required after submission of the final document to the dissertation committee for approval. Signatures of all members of the dissertation committee must be received for final approval to be granted. The oral defense is open to the university community and general public and must be announced early.