

# Civil Engineering, PhD—Advanced Entry

Awarding of the Doctor of Philosophy degree is based on exceptional performance in course work as well as evidence of ability to formulate and execute original research. The PhD program has two components:

1. An academic program of graduate-level courses that provides depth in a specific area of civil engineering (the major field) as well as other course work that provides additional exposure at an advanced level to one or more disciplines
2. The dissertation, an extended independent research effort on a relevant technical problem resulting in an original contribution to the field

Upon acceptance into the program, an applicant is designated as a doctoral student. This designation is changed to doctoral candidate upon successful completion of the doctoral qualifying examinations (both written and oral area exams) and all the required course work.

Each student's mastery of subject matter is measured by a qualifying examination covering a subset of topics selected from the major field. A doctoral dissertation committee periodically monitors research progress, and the candidate is required to present and defend his or her research results before the doctoral dissertation committee upon completion of the work.

## Course Work Requirement

The academic program must include at least 52 semester hours of graduate-level course work beyond the bachelor's degree. Students with a master's degree in civil engineering must complete a minimum of 20 semester hours of course work at Northeastern University. A student may count no more than 4 semester hours of independent study (such as special project in civil engineering) toward the minimum course requirements. A minimum of 40 semester hours must be related to the major field but may include courses from other departments when appropriate.

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, Exam Preparation—Doctoral (CIVE 8960), can be taken if needed to fulfill full-time course registration. The course is an individual instruction course, billed at 1 semester hour, 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."

Upon successful completion of the qualifying exam and the majority of required course work, each doctoral candidate must register in two consecutive semesters for Dissertation (CIVE 9990). Upon completion of this sequence, the candidate must register for Dissertation Continuation (CIVE 9996) in every semester until the dissertation is complete. Students may not register for Continuation until they fulfill the two-semester dissertation sequence.

## Qualifying Examination and Degree Candidacy

The qualifying exam includes written and oral components. Its content depends upon the educational background and objectives of the student. In general, the written component covers subject matter at the master's degree level selected from the major field and includes basic engineering and science disciplines, as well as civil engineering application areas. The oral component measures general comprehension and aptitude for research. If a student fails the exam, he or she may retake it one more time with the permission of the qualifying examination committee.

Students must take the qualifying exam during the first 18 months of their PhD program. Upon successful completion of the exam and all required course work, the student is classified as a doctoral candidate.

## Comprehensive Examination

The comprehensive exam is a defense of the doctoral research work and an examination on subject matter related to the dissertation area.

## Dissertation

Once degree candidacy is established, a doctoral candidate may proceed with his or her dissertation. The candidate must write a dissertation proposal and name a civil and environmental engineering faculty member as the dissertation advisor. A doctoral dissertation committee formed by the student and his or her dissertation advisor will monitor progress and approve the final document. The doctoral dissertation committee shall have no fewer than four members, at least two of whom must be full-time faculty from the Department of Civil and Environmental Engineering (CEE).

Each student, along with a faculty advisor, must jointly develop a proposal defining the content of the academic program, subject to review by the dissertation committee. Intellectual rigor, connectivity of subject matter, and compatibility with departmental interests are critical issues. The doctoral dissertation committee's approval of the proposal represents a mutual agreement between the student and the committee. The CEE department encourages flexibility in program definition, especially in areas where complementary courses exist in other departments or where expertise resides outside the department and where the objective is to introduce new technology in civil engineering practice.

Each doctoral candidate must defend his or her dissertation within seven years from the start of the PhD program.

## Residence Requirement

After achieving PhD candidacy, students must complete at least two successive semesters of full-time study on campus to establish residence. The total effort for a PhD program involves a minimum of three years of full-time work beyond the bachelor's degree. Students who enter the doctoral program with a Master of Science degree may complete the requirements in less time but should anticipate at least two years of full-time effort.

## Language Requirement

Each doctoral candidate must be proficient in technical writing and oral presentation in the English language. The qualifying examination committee may require additional course work in the case of any deficiency in these areas.

## Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

## Milestones

Qualifying examination and comprehensive examination  
Annual review  
Dissertation proposal  
Dissertation committee  
Dissertation defense

### **Core Requirements**

Complete 20 semester hours of approved course work. Consult your faculty advisor for acceptable courses. Please note that a maximum of 4 semester hours of Independent Study (CIVE 7978) will be accepted toward the 20-semester-hour requirement.

### **Dissertation**

| <b>Code</b>                                       | <b>Title</b> | <b>Hours</b> |
|---|--------------|--------------|
| Complete the following (repeatable) course twice: |              |              |
| CIVE 9990   | Dissertation |              |

### **Program Credit/GPA Requirements**

20 total semester hours required  
Minimum 3.000 GPA required