

CIVIL ENGINEERING (PHD)

Department Website (<https://engineering.nyu.edu/academics/programs/civil-engineering-phd/>)

NYSED: 08810 **HEGIS:** 0908.00 **CIP:** 14.0801

Program Description

The Department of Civil and Urban Engineering currently offers two doctoral degree programs: PhD in Civil Engineering and PhD in Transportation Planning and Engineering. Requirements for the Civil Engineering degree are detailed here. For information on the Transportation Planning and Engineering program, see the "Transportation" section of this catalog.

Areas of Concentration

Students pursuing the PhD in Civil Engineering must choose to specialize in one of the following subdisciplines of civil engineering:

- Structural Materials and Engineering
- Geotechnical and Geo-environmental Engineering
- Environmental and Water Resources Engineering
- Construction Management and Engineering
- Highway and Traffic Engineering
- Urban Infrastructure Systems

Other focus areas are possible and can be developed with the assistance of faculty advisers. All subject areas must be relevant to the degree sought, and a faculty member must be willing and able to guide the student's research.

Admissions

1. Admission to the PhD in Civil Engineering requires a Master of Science in Civil Engineering or equivalent with a GPA of 3.5 or better (on a 0-4 scale).
2. All applicants are required to submit GRE scores for consideration.
3. International applicants must take the TOEFL examination and submit the results for consideration.

In criterion 1 above, the "equivalent" can be achieved in several ways. The candidate may have a Master of Science degree with a different title that covers substantially the same material. In more general terms, the applicant must demonstrate that he or she has the equivalent of all undergraduate and master's-level course work to be able to pursue doctoral-level work in the chosen major area, as well as in a minor area within the umbrella of civil engineering. Further, "equivalence" is evaluated based on the totality of the student's undergraduate and graduate record, not course by course. Thus, an applicant who wishes to pursue doctoral work in Environmental Engineering, for example, must have the entire undergraduate and master's-level course background expected in Environmental Engineering, but need not demonstrate such a background in structures. Because admission to a PhD program requires a relevant Master of Science (or equivalent), an applicant who has not yet earned a master's degree will be admitted as Master of Science student and is expected to earn a Master of Science degree while completing the major and minor course requirements. In rare cases, an applicant with only a Bachelor of Science degree may be directly admitted into the PhD program with the written approval of the department head.

Every PhD student upon admission is assigned an academic adviser, who is designated by the department head. Any member of the civil engineering faculty may be an academic adviser to a PhD student. The first meeting should take place shortly after receiving an acceptance letter from the Admissions Office. During this first meeting the student's Program of Study should be established. The Program of Study should include a list of the fundamental and advanced topics that will comprise the specific courses, the subject matter for the qualifying exam and possible research areas.

In cases where a student is supported on a research contract, the principal investigator of the contract will normally be the student's academic adviser. Where a student has a particular research interest and is working with a particular faculty member, the student may request that faculty member for his or her academic advisor. In rare cases, when a PhD student enters the program without a prior selection of a major area of study, the initial academic adviser will be the graduate coordinator of the program area. Each PhD candidate reports to two advisory committees: an Academic Advisory Committee and a Dissertation Committee.

Program Requirements

The program requires the completion of 75 credits, comprised of the following:

Course	Title	Credits
Major Requirements		
Major Area Courses		45
Minor Area Courses		9
Dissertation Research		21
Total Credits		75

1. 54 credits of graduate course work (not including the PhD dissertation) in relevant major and minor areas of study beyond the bachelor's degree, with an average grade of B or better (cumulative average of 3.0 or better on a 0-4 scale). Up to 6 credits of the 54 credits may be satisfied by individual guided studies, readings, projects and theses.
2. Completion and successful defense of a 21-credit dissertation related to the major area of study. Dissertations must consist of original research that meaningfully advances the state of the art in the research subject area and should result in the publication of at least one paper in a strictly peer-reviewed technical journal related to the subject. A grade of B or better must be achieved for the dissertation. There are two types of dissertation credits:
 - CE-GY 998X DISSERTATION LEVEL RESEARCH: Independent original investigation demonstrating creativity and scholarship worthy of publication in a recognized engineering journal. Registration for a maximum of 6 credits is permitted for PhD students prior to passing the PhD qualifying examination. PhD students who passed their qualifying examination should register for CE-GY 999X PHD DISS IN CIVIL ENGINEERING DEPARTMENT .
 - CE-GY 999X PHD DISS IN CIVIL ENGINEERING DEPARTMENT: Independent original investigation demonstrating creativity and scholarship worthy of publication in a recognized engineering journal. Candidates must successfully defend dissertations orally. Registration for 3 to 6 credits per semester is permitted after successfully completing the doctoral qualifying examination, but a minimum of 12 credits must be completed before the defense. Registration must be continuous (excluding summer semesters),

unless a formal leave of absence is requested and approved. Registration for 3 to 12 credits is permitted in the final semester of work, with the approval of the department head. *Prerequisites: successful completion of doctoral qualifying examinations and approval of the dissertation adviser.*

3. Completion of one minor area of study, as follows:
 - Out of Department Minor: Completion of 9 credits of graduate course work in one technical area of study.
Or
 - In-Department Minor: Completion of 9 credits of graduate course work in a minor area outside the major subdiscipline in civil engineering.
4. Residency requirements for the PhD in Civil Engineering include the 21-credit dissertation plus a minimum of 15 credits of applicable graduate course work taken at NYU Polytechnic School of Engineering.
5. In satisfying the 54-credit course requirement (requirement 1), the student must satisfy all requirements for the major and minor areas selected, or their equivalents.
6. In satisfying these basic PhD requirements, students also must satisfy one of the two following conditions:
 - a. 48 credits of relevant graduate course work, not including individual guided studies (readings, projects, theses, etc.) beyond the bachelor's degree, with an average grade of B or better (cumulative average of 3.0 or better on a 0-4 scale).
 - b. 24 credits of approved graduate course work, not including individual guided studies (readings, projects and theses) beyond the master's degree, with an average grade of B or better (cumulative average of 3.0 or better on a 0-4 scale). Satisfying condition 6ii requires that the department accept the student's Master of Science degree *in toto* without regard to its specific content. This acceptance requires a recommendation from the department's Graduate Committee and department head approval.
7. Although publication is not required as a condition for graduation at this time, journal publication is strongly encouraged. Every PhD candidate is expected to generate knowledge worthy of publication in two or more reputable journals.

Qualifying Examination

A student must register for RE-GY 9990 PHD QUALIFYING EXAM in the semester in which the qualifying exam will be taken. This course carries no credit, and the student incurs no fees. It provides a place in the student's official transcript to record when the qualifying exam was taken and the result.

Every student pursuing a PhD must pass a qualifying examination before becoming a candidate for the PhD. The qualifying examination consists of a six-hour written portion (generally given in two three-hour blocks on the same day), and an oral portion which may be given before or after the written portion. Both written and oral portions focus on fundamental and advanced civil engineering topics relevant to the student's specific program of study.

The oral portion may also explore specific skill areas required to conduct successful independent research. Students are deemed to have passed the examination based upon an overall evaluation of both the written and oral portions of the examination.

The qualifying examination is a pass/fail milestone in the PhD process. A letter indicating the result of each examination is placed in the

student's graduate file. In rare cases, a student may be deemed to have conditionally passed the qualifying exam. This may occur when the student does extremely well in all but one area. Such a student must follow a prescribed plan to strengthen his or her knowledge and skills in the weak area and pass a special examination in the weak area within one calendar year. A student who conditionally passes the qualifying exam may register for dissertation credits and may form a Dissertation Committee.

While each student will take a different qualifying examination based upon an individual program of study, the exam is considered a departmental examination. All department faculty members in each civil engineering subdiscipline may participate in submitting written problems. Each student's academic advisory committee will review the entire exam before it is administered, and may suggest changes if it deems the examination, as presented, to be an inequitable test of the student's abilities. Recommendations on examination results are submitted by each student's Academic Advisory Committee. The departmental faculty, acting as a whole, votes to accept or reject such recommendations at a meeting scheduled for this purpose. Additionally:

1. According to NYU Tandon School of Engineering policy, students should take the qualifying exam within their first year of study at NYU Tandon School of Engineering.
2. A student may take the qualifying exam once. A second attempt is permitted only with written permission from the Academic Advisory Committee and the approval of the department head. Under no circumstances may a student take the examination more than two times.
3. No student may register for CE 999X Dissertation credits until passing the qualifying exam.
4. A Dissertation Committee cannot be formed until the student passes the qualifying exam.
5. Any student who cannot pass the qualifying exam will be disqualified from the program.

Dissertation Committee

A Dissertation Committee is formed immediately after a student passes the qualifying exam to guide the student's course of study and research work. This committee will serve as a panel of experts to aid the candidate throughout his or her research.

The Dissertation Committee shall have no less than five members, including a chairperson, a major adviser, and an adviser for each minor the student is pursuing, one of whom must be on the faculty in another NYU Tandon School of Engineering department. One external member who is either a faculty member at another academic institution or a noted PhD-level practitioner is encouraged. Additional faculty members may also serve on the Dissertation Committee.

The members of the Academic Advisory Committee may also serve on the Dissertation Committee. The membership of the Dissertation Committee must be approved by the department head and recorded with the Office of Graduate Academics.

The major adviser, who may also serve as chairperson, must be a full-time faculty member of the Department of Civil and Urban Engineering.

Dissertation Proposal

Upon passing the qualifying exam and the appointment of a Dissertation Committee, the PhD candidate must submit a written Dissertation Proposal outlining the subject of the proposed research. This proposal

should be 15 to 20 pages long and should address the following specific items:

1. Description of the topic;
2. Literature review sufficient to ensure original work;
3. Method(s) for the research;
4. Data and/or laboratory needs and their availability; and
5. Anticipated outcomes.

The Dissertation Proposal must be submitted within one year of full-time study after passing the qualifying exam.

The Dissertation Proposal is presented orally and defended before the Dissertation Committee and other interested departmental faculty. The date of the oral defense and copies of the draft Dissertation Proposal must be available to departmental faculty at least two weeks (14 calendar days) before the defense.

When the Dissertation Proposal is formally accepted and defended successfully, the chairperson of the Dissertation Committee shall enter a letter into the student's graduate file, indicating this acceptance, together with a copy of the Dissertation Proposal. While the Dissertation Committee has reasonable flexibility to modify the Dissertation Proposal during the research, any significant change in focus area or methodology requires submission of an amended Dissertation Proposal and formal acceptance as described herein.

Dissertation Defense

The culmination of the student's PhD work is the oral presentation and defense of the final draft dissertation. A defense is generally scheduled after the Dissertation Committee reviews the draft dissertation and determines that it is complete and of sufficient quality to be presented and defended.

The defense is organized and scheduled by the Dissertation Committee. All Institute faculty members may observe and ask questions at all NYU Tandon School of Engineering dissertation defenses. Therefore, the date of the defense must be announced Institute-wide at least one month before the event, and copies of the draft dissertation must be available to any faculty member who requests one in a timely fashion and in no case less than two weeks before the defense.

Sample Plan of Study

Course	Title	Credits
1st Semester/Term		
Major Area Course		3
Major Area Course		3
Minor Area Course		3
Credits		9
2nd Semester/Term		
Major Area Course		3
Major Area Course		3
Minor Area Course		3
RE-GY 9990	PHD QUALIFYING EXAM	0
Credits		9
3rd Semester/Term		
Major Area Course		3
Major Area Course		3
Minor Area Course		3
Credits		9
4th Semester/Term		
Major Area Course		3

Major Area Course		3
Major Area Course		3
Credits		9
5th Semester/Term		
Major Area Course		3
Major Area Course		3
Major Area Course		3
Credits		9
6th Semester/Term		
Major Area Course		3
Major Area Course		3
Major Area Course		3
Credits		9
7th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
Credits		3
8th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
Credits		3
9th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
Credits		3
10th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
Credits		3
11th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	3
Credits		3
12th Semester/Term		
CE-GY 999X	PHD DISS IN CIVIL ENGINEERING DEPARTMENT	6
Credits		6
Total Credits		75

Learning Outcomes

Upon successful completion of the program, graduates will:

1. Specialize within one of the subdisciplines of civil engineering.
2. Perform independent fundamental research in one of the subdisciplines of civil engineering.
3. Produce a piece of fundamental research that advances meaningfully the state of the art of one of the subdisciplines of civil engineering and is publishable in a first-tier refereed civil engineering related journal.

Policies NYU Policies

University-wide policies can be found on the New York University Policy pages (<https://bulletins.nyu.edu/nyu/policies/>).

Tandon Policies

Additional academic policies can be found on the Tandon academic policy page (<https://bulletins.nyu.edu/graduate/engineering/academic-policies/>).