

# PH.D. IN CIVIL ENGINEERING

## Overview

The Department of Civil, Architectural, and Environmental Engineering (CAE) offers a Doctor of Philosophy (Ph.D.) degree in Civil Engineering with the following areas of emphasis:

- Civil Engineering
- Architectural Engineering
- Environmental Engineering

The educational objectives of the Doctor of Philosophy program in Civil Engineering are to produce graduates whom:

1. Have advanced technical knowledge in at least one specialty area of civil engineering
2. Have advanced capability to apply advanced knowledge to engineering problems
3. Have made significant contributions in at least one specialty area of civil engineering

The specialty areas of study for the Ph.D. include:

- Structural Engineering and Structural Materials
- Environmental Engineering
- Water Resources Engineering
- Integrated Building Systems
- Mechanical, Electrical, and Plumbing (MEP) Systems

For students who already have an earned Master of Science (in either civil, architectural, or environmental engineering), 30 graduate-level credits are required beyond the M.S. degree. For students who do not have an M.S. (in civil, architectural, or environmental engineering), a minimum of 60 graduate-level credits are required beyond the B.S. degree. All students are required to engage in supervised research and defend a dissertation.

The Program of Study is the student's specific set of coursework that defines the course requirements for graduation and must be approved by an advisory committee (known as the Supervisory Committee). Depending on whether the student already has an earned M.S. degree, the Ph.D. degree can typically be completed within two to five years.

## Curriculum Requirements

**For a Ph.D. following an M.S.**

**For students who already have an earned M.S. (in civil, architectural, or environmental engineering), a minimum of 30 graduate-level credits are required beyond the B.S. degree with an average of "B" or better and no grade below a "C". Of the credits:**

- At least 18 credits in CAE

- At least 18 credits of lecture-based and/or Independent Study courses
- At least 6 credits of lecture-based CAE courses at the 700 level (not Independent Study)
- 12 credits of Doctoral Dissertation (CAE 830 and/or CAE 840)
- A total of 6 credits of transfer and/or exchange coursework (not counted towards the B.S. or M.S. degrees) may be taken at another institution and used to satisfy the requirements for the Ph.D. degree.

## The table presents an overview of the courses selection:

Code	Title	Credit Hours
CAE 830 and/or CAE 840		12
2 CAE 700 Level Lecture-Based Courses		6
4 Elective Courses		12
Total Credit Hours		30

Note: All courses, except Dissertation, are 3 credit hours unless otherwise indicated. Refer to the Additional Details section (below) for additional options and restrictions.

**For a Ph.D. without prior M.S.**

**For students who do not have an M.S. (in civil, architectural, or environmental engineering), a minimum of 60 graduate-level credits are required beyond the B.S. degree with an average of "B" or better and no grade below "C". Of the 60 credits:**

- At least 42 credits of lecture-based and/or Independent Study courses
- At least 12 credits of lecture-based CAE courses at the 700 level (not Independent Study)
- At least 30 credits in CAE
- 18 credits of Doctoral Dissertation (CAE 830 and/or CAE 840)
- A total of 12 credits of transfer and/or exchange coursework (not counted towards the B.S. or M.S. degrees) may be taken at another institution and used to satisfy the requirements for the Ph.D. degree.

## The table presents an overview of the course selection:

Code	Title	Credit Hours
CAE 830 and/or CAE 840		18
4 CAE 700 Level Lecture-Based Courses		12
10 Elective Courses		30
Total Credit Hours		60

Note All courses, except Dissertation, are 3 credit hours unless otherwise indicated. Refer to the Additional Details section (below) for additional options and restrictions.

## **Qualifying Examination**

A Ph.D. student must pass a Qualifying Examination, generally taken at the end of the first year of study, before being allowed to defend a dissertation proposal. The examination, administered by the student's Supervisory Committee, must consist of a written component, and may also include an oral component if deemed appropriate by the Supervisory Committee. Three outcomes of the examination are possible: *Pass, Fail, and Fail with option to re-take once.*

## **Dissertation Proposal Defense**

Subsequent to passage of the Qualifying Examination, the student can defend his/her Dissertation Proposal to their Dissertation Committee, which is typically the same as the student's Supervisory Committee or, if not, has makeup equivalent to the Supervisory Committee. All Committee members must approve the Proposal.

## **Admission to Candidacy**

Admission of the student to Candidacy is subject to passage of the Qualifying Examination and passage of the oral Dissertation Proposal Defense.

## **Dissertation Defense**

The Ph.D. thesis must be defended to, approved by, and signed by the student's Dissertation Committee, which is typically the same as the student's Supervisory Committee or, if not, has a composition that is equivalent to the Supervisory Committee.

## **Additional Details**

- Master's Design Project (CAE 604) *will not* count towards the Ph.D. degree requirements.
- Internships, Practical Training, workshops, or other types of practicum are neither required nor optional credit-earning components in the established graduate curriculum (Program of Study). Credit earned through these experiences (such as UMI 605) *will not* count towards any CAE degree requirements.
- At a minimum, a qualifying exam and a final public oral examination in defense of the thesis are required.
- The Supervisory Committee (and Dissertation Committee) must have a minimum of 4 members, including:
  1. Committee Chair (Advisor) shall be full-time CAE faculty and a member of the Graduate Faculty.
  2. CAE faculty and a member of the Graduate Faculty
  3. CAE faculty and a member of the Graduate Faculty
  4. Non-CAE member with an earned Ph.D.