

CIVIL ENGINEERING (PHD)

Doctor of Philosophy in Civil Engineering (CE PHD)

Unit: Speed School of Engineering (<http://engineering.louisville.edu>) (GS)

Department: Civil and Environmental Engineering (<https://engineering.louisville.edu/academics/departments/civil/>)

Academic Plan Code(s): CE_PHD

Program Information

General Information

The PhD degree program is intended for persons having an accredited masters and/or baccalaureate degree in civil engineering, but is available to those with other backgrounds. Applicants with other backgrounds should plan on taking some undergraduate background coursework. Students interested in the PhD degree program should consult the Director of Graduate Studies in the Department of Civil Engineering.

Degree Requirements

The award of a Doctor of Philosophy degree indicates that a student has attained mastery of a field and has demonstrated the capacity to perform independent scholarly research. Candidates for the Doctor of Philosophy degree must have a minimum final cumulative grade point average of 3.00 for all academic coursework attempted in Graduate Studies.

The requirements for the Doctor of Philosophy degree are explained in more detail in the Degree Requirements section (<https://catalog.louisville.edu/graduate/general-policies-procedures-requirements/degree-requirements/>) of this catalog.

Admission Standards

The admission standards for the PhD program in Civil Engineering are as follows:

- All admission applications for the program shall include:
 - A completed graduate application (<http://louisville.edu/graduate/futurestudents/apply-materials/application/>) for the Graduate School,
 - An application fee,
 - Results from the Graduate Record Examination (GRE),
 - Statement of Purpose (include intended area of study and/or research interests)
 - Resume
 - At least two letters of recommendation, and
 - Official transcript(s) for all previous post-secondary coursework. All transcripts not in English must be certified as authentic and translated verbatim into English.
- The minimum requirement for admission is the baccalaureate degree or its equivalent from an accredited institution.
- The successful applicant will typically have an undergraduate grade point average of 3.00 or above (on a 4.00 scale).
- The successful applicant will typically have a GRE combined Verbal and Quantitative Reasoning score of 295 or above.
- International students whose primary language is not English must show English language proficiency by either TOEFL/IELTS/Duolingo score or demonstration of a degree awarded from an acceptable English language institution. The successful applicant will typically

have a TOEFL score of 79 or higher or overall IELTS score of 6.5 or higher or a Duolingo score of 105 or higher.

Program Requirements

Normally, it is expected that the student will complete a master's degree before being admitted to the PhD Program. However, qualified applicants may be admitted directly to the doctoral program after receiving a baccalaureate degree. These students will be required to complete an additional 30 credit hours of coursework at the 500 and 600 level under an individual plan developed in conjunction with the department's Director of Graduate Studies. Also, remedial work may be specified for those applicants who, in the opinion of the faculty, do not have a sufficient background.

The PhD program has four different focus areas available: Structural Engineering, Geotechnical Engineering, Transportation Engineering, and Water Resources.

The minimum curricular requirements for the doctoral program are:

| Code | Title | Hours |
|---|--------------------------------|-----------|
| Courses - Post Bac | | |
| Approved Master's Level Course Work | | 30 |
| CEE 698 | Civil Engineering PhD Seminar | 3 |
| Core Courses (Select two courses from a focus area below) | | 6 |
| Technical Electives ¹ | | 9 |
| CEE 699 | Civil Engineering PhD Research | 12 |
| Minimum Total Hours | | 60 |

Candidates for the Doctor of Philosophy degree must have a minimum final cumulative grade point average of 3.00 for all academic work attempted in Graduate Studies.

¹ Technical electives can be CEE or non-CEE courses. Technical Electives must be approved by the department.

Focus Areas

Structural Engineering

| Code | Title | Hours |
|---------|--|-------|
| CEE 522 | Fundamentals of Prestressed Concrete | 3 |
| CEE 523 | Timber Design | 3 |
| CEE 620 | Advanced Mechanics of Solids | 3 |
| CEE 621 | Finite Element Analysis for Structural Engineers | 3 |
| CEE 626 | Masonry Design | 3 |

Geotechnical Engineering

| Code | Title | Hours |
|---------|--|-------|
| CEE 553 | Advanced Foundation Design | 3 |
| CEE 650 | Measurement of Soil Properties | 3 |
| CEE 652 | Advanced Earth Pressure and Retaining Structures | 3 |
| CEE 656 | Geotechnical Earthquake Engineering | 3 |

Transportation Engineering

| Code | Title | Hours |
|---------|--|-------|
| CEE 560 | Traffic Engineering | 3 |
| CEE 562 | Geometric Design of Highways | 3 |
| CEE 660 | Transportation Planning and Urban Development | 3 |
| CEE 664 | Fundamentals of Intelligent Transportation Systems | 3 |

Water Resources

| Code | Title | Hours |
|---------|--|-------|
| CEE 573 | Groundwater Hydrology | 3 |
| CEE 673 | Advanced Hydrology | 3 |
| CEE 676 | Sediment Transport and River Mechanics | 3 |
| CEE 681 | Green Engineering & Sustainable Design | 3 |