CIVIL ENGINEERING, PH.D.

The civil engineering, Ph.D., program at Saint Louis University focuses on independent research and the pursuit of academic excellence, strong industry partnerships, innovative teaching methodologies, and a culture of belonging. These elements collectively prepare students for successful careers and address the evolving needs of the region, nation, and world.

As part of their degrees, students take graduate-level courses to deepen their knowledge, understanding, and skills in civil engineering sub-disciplines, as well as perform independent discovery or design-focused original research under the guidance of SLU's graduate faculty members.

Curriculum Overview

This is a 54-credit-hour degree program. This includes six credit hours of required courses and six credit hours taken from a set of foundational courses. Students will take an additional 30 credit hours of coursework and 12 credit hours of dissertation research.

Experiential and Applied Learning

Department of Civil Engineering graduate students gain valuable experience working with both faculty and peers. Additional opportunities to publish in scientific journals and attend professional conferences prepare our graduates for careers in industry or academia.

Saint Louis University's location in a vibrant and industry-rich city means that faculty members have access to and relationships with industry professionals. The School of Science and Engineering provides many opportunities for these professionals to interact with students, share their real-world experiences, network, and even collaborate on research projects. Therefore, students have access not only to top-notch faculty but to the most recent developments in industry. The expert faculty of the Department of Civil Engineering collaborate with graduate students in groundbreaking research in the following areas:

- Autonomous vehicles and electric vehicles
- Environmental engineering
- Geotechnical engineering and geoenergy systems
- Structural engineering
- Transportation engineering
- Water resources and hydraulic engineering

Careers

Graduates of the doctoral program seek employment in industry, government or academia.

Admission Requirements

Begin your application for this program at https://gradapply.slu.edu/apply/.

Most admitted students meet the following criteria:

- Undergraduate cumulative GPA of at least 2.75; cumulative GPA of 3.00 preferred.
- A four-year B.S. degree in Civil Engineering, or closely related engineering and science disciplines.

Application Requirements

- Application form.
- Transcript(s) from all colleges and universities attended.
- Three letters of recommendation (preferably from recent instructors).
- Résumé or curriculum vitae.
- Professional goal statement. The statement should clearly indicate students' interest in Civil Engineering and identify professional and research goals.

Requirements for International Students

Along with the general admission requirements above, the following must be provided by prospective international students:

- Demonstration of English Language Proficiency.
- Proof of financial support that must include:
  - A letter of financial support from the person(s) or sponsoring agency funding the time at Saint Louis University.
  - A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of study at the University.
- Academic records, in English translation, for postsecondary studies outside the United States. These must include the courses taken and/or lectures attended, practical laboratory work, the maximum and minimum grades attainable, the grades earned or the results of all end-of-term examinations, and any honors or degrees received. WES and ECE transcripts are accepted.

Review Process

Applicants are admitted based on their research interests and openings in the research groups. The goal is to ensure a successful match with a faculty member who has the capacity to mentor the student on a dissertation that is in alignment with the student's preparation, interest, and career goals.

In cases where an applicant has a non-civil engineering background, applications will be reviewed to assess fit with civil engineering faculty expertise. Depending on the applicant's background, prerequisite or concurrent courses may be required to qualify for the PhD program. Such applicants may receive provisional admission. For provisionally admitted students, any required coursework will be specified in SLATE and in the admission letter.

Learning Outcomes

1. Apply advanced mathematical and science principles, and computational and modeling tools to solve civil engineering problems. Students will be able to develop and implement innovative solutions to address current and emerging challenges in the design, analysis, and management of civil engineering infrastructure and resources.
2. Communicate complex technical information effectively. Students will be able to prepare clear and concise written reports, create compelling visual aids, and deliver effective oral presentations on technical topics.
3. Create new knowledge: Conduct original and significant research that generates new knowledge and advances the theory or practice of civil engineering.

Requirements

All coursework must be completed with the minimum grade of B-.

Code	Title	Credits
Primary Courses		
CVNG 5010	Scholarly Practices in Engineering	3
MENG 5840	Numerical Methods	3
Foundational Courses		**6**
Students select six credits from the following:		
CVNG 5030	Foundation Engineering	
CVNG 5035	GeoSolutions for Climate Change	
CVNG 5050	Advanced Structural Analysis	
CVNG 5070	Structural Dynamics	
CVNG 5270	Green Infrastructure	
CVNG 5350	Hydraulic Modeling	
CVNG 5370	River Engineering	
CVNG 5460	Multimodal Roadway Safety	
CVNG 5480	Traffic Simulation and Modelling	
Electives		**30**
Students should select 10 courses of CVNG graduate courses which may include additional foundational courses. If a student wishes to take a non-CVNG course, that course must be approved by the student's PhD faculty advisor or the graduate program coordinator.		
Dissertation Research		**12**
Students will take a total of 12 credits over multiple semesters.		
CVNG 6990	Doctoral Dissertation Research	
Total Credits		**54**

Non-course Requirements

Program of Study

By the end of their first semester, each student should complete a Program of Study form listing the courses they plan to take to complete the requirements for their program. The form needs to be filed with the SSE Graduate Office and can be updated annually as needed.

Qualifying Examination

The qualifying examination, which consists of both written and oral components, is intended to test the student's fundamental knowledge in the area of their research and their ability to conduct independent research. The general recommendation is to take the qualifying exam during the third semester. The qualifying exam must be completed by the end of the fifth semester of the Ph.D. program.

Dissertation Proposal Examination

The committee for the proposal examination consists of at least four faculty members: the student's advisor, at least one other civil engineering faculty member, one SLU faculty member from outside civil engineering department, and one or two faculty members external to the university. The student and faculty advisor work together to identify the committee members. If the student cannot identify an external committee member, this position may be filled by an internal committee member with the permission of the graduate program coordinator.

A student who passes the qualifying and dissertation proposal examinations advances to doctoral candidate status.

Final Defense of the Ph.D. Dissertation

The dissertation defense is conducted by the student's proposal examination committee. In the event that not all of the members who served on the proposal examination are available to serve on the dissertation defense committee, substitutions may be made. The dissertation defense will be presented orally in a public seminar lasting 30 to 45 minutes. The open forum is followed by a closed-door session, where the Dissertation Committee conducts an oral examination of the student within the area of the conducted research.

Roadmap

This roadmap is just one example of a semester-by-semester plan of study for this program. There are other plans students can and do take. The plan of study for each particular student is established in consultation with each student's academic advisor; *this roadmap does not replace academic advising appointments.*

Roadmap notes:

- This Roadmap assumes full-time enrollment unless otherwise noted.
- Courses/Milestones marked with an "!" are critical and must be completed in the semester listed in the Roadmap to ensure a timely graduation.
- Course availability and sequencing are subject to change.

Course	Title	Credits
Year One		
Fall		
CVNG 5010	Scholarly Practices in Engineering	3
Foundational Course		3
CVNG Elective		3
	Credits	**9**
Spring		
MENG 5840	Numerical Methods	3
Foundational Course		3
CVNG Elective		3
	Credits	**9**
Year Two		
Fall		
CVNG Electives		9
	Credits	**9**
Spring		
CVNG Electives		9
	Credits	**9**
Year Three		
Fall		
CVNG Elective		3
CVNG 6990	Doctoral Dissertation Research	3
	Credits	**6**
Spring		
CVNG Elective		3
CVNG 6990	Doctoral Dissertation Research	3
	Credits	**6**

Year Four		
Fall		
CVNG 6990	Doctoral Dissertation Research	3
	Credits	**3**
Spring		
CVNG 6990	Doctoral Dissertation Research	3
	Credits	**3**
	Total Credits	**54**

Contact Us

For more information about any School of Science and Engineering graduate program, email ssegrad-admissions@slu.edu.