

STRUCTURAL ENGINEERING, B.S.

The Saint Louis University Department of Civil Engineering offers a Bachelor of Science in Structural Engineering that provides students with an in-depth experience focused solely on structural engineering. The curriculum emphasizes professional practice to better prepare students for the structural engineering licensure exam after graduation using project-based, hands-on learning methods.

As a student in the structural engineering program, you will develop critical thinking and leadership skills to address society's needs at local, regional and global levels. Students also have the opportunity to join many student clubs, such as the student chapter of the American Society of Civil Engineers and participate in project competitions like the AISC National Student Steel Bridge Competition.

Curriculum Overview

SLU's structural engineering program provides a solid foundation of coursework in the engineering sciences, including solid mechanics and fluid dynamics. The program primarily focuses on the structural engineering side of civil engineering, including a broad range of topics related to structural analysis and advanced structural analysis, structural dynamics, reinforced concrete and steel design, advanced courses in reinforced concrete and steel design, masonry and timber structures, and bridge design along with complimentary courses in construction, materials, and geotechnical engineering. In addition to the core technical content, the curriculum features a unique hands-on learning environment that illustrates real-world applications.

Fieldwork and Research Opportunities

Students at SLU can engage with industry through various internship opportunities and/or undergraduate research experiences. Internship opportunities include the public and private sector and students can arrange for their internship experience to count toward a professional development elective under the direction of a faculty mentor. Undergraduate research opportunities include the SURGE and FIRE programs that allow students to work on collaborative projects under the direction of a faculty member in a university research lab.

Careers

Students with a B.S. in structural engineering can pursue graduate or professional school or enter industry. Some examples of career paths related to structural engineering include but are not limited to:

- Private consulting
- Architectural and engineering firms
- Bridge engineering
- Forensic engineering
- Construction industry
- Government agencies
- Aerospace industry

Admission Requirements

Begin Your Application (<https://www.slu.edu/apply.php>)

Saint Louis University also accepts the Common Application.

Freshman

All applications are thoroughly reviewed with the highest degree of individual care and consideration to all credentials that are submitted. Solid academic performance in college preparatory coursework is a primary concern in reviewing a freshman applicant's file.

To be considered for admission to any Saint Louis University undergraduate program, applicants must be graduating from an accredited high school, have an acceptable HiSET exam score or take the General Education Development (GED) test.

Transfer

Applicants must be a graduate of an accredited high school or have an acceptable score on the GED or HiSET.

Students who have attempted fewer than 24 semester credits (or 30 quarter credits) of college credit must follow the above freshmen admission requirements. Students who have completed 24 or more semester credits (or 30 quarter credits) of college credit must submit transcripts from all previously attended college(s).

In reviewing a transfer applicant's file, the Office of Admission holistically examines the student's academic performance in college-level coursework as an indicator of the student's ability to meet the academic rigors of Saint Louis University. Where applicable, transfer students will be evaluated on any courses outlined in the continuation standards of their preferred major.

International Applicants

All admission policies and requirements for domestic students apply to international students along with the following:

- Demonstrate English Language Proficiency (<https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/>)
- All academic records must include an English translation. An official course-by-course transcript evaluation may be required and accepted.

Additional Admission Requirements

In addition to the general admission and matriculation requirements of Saint Louis University, applicants to SLU's engineering programs must meet the following requirements:

- **GPA:** Minimum cumulative 3.00 high school GPA for freshmen applicants and 2.70 college GPA for transfer applicants.
- **Coursework:** Strong applicants will have 15 total units of high school work, including three or four units of English; four or more units of mathematics, including algebra I and II, geometry and precalculus (Algebra II with Trigonometry is not sufficient).

Admission to the School of Science and Engineering's degree programs is based on a combination of secondary school grades, college admission test scores, co-curricular activities and attempted college coursework, as well as other indicators of the applicant's ability, career focus and character. This process respects the non-discrimination policy of the University and is designed to select a qualified, competent and diverse student body with high standards of scholarship and character, consistent with the mission of the University.

Tuition

Tuition/Fee	Cost Per Year
Undergraduate Tuition	\$56,960

Additional charges may apply. Other resources are listed below:

Net Price Calculator (<https://www.slu.edu/financial-aid/tuition-and-costs/calculator.php>)

Information on Tuition and Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition/>)

Miscellaneous Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/fees/>)

Information on Summer Tuition (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer/>)

Scholarships and Financial Aid

There are two principal ways to help finance a Saint Louis University education:

- **Scholarships:** Scholarships are awarded based on academic achievement, service, leadership and financial need.
- **Financial Aid:** Financial aid is provided through grants and loans, some of which require repayment.

Saint Louis University makes every effort to keep our education affordable. In fiscal year 2023, 99% of first-time freshmen and 92% of all students received financial aid (<https://www.slu.edu/financial-aid/>) and students received more than \$459 million in aid University-wide.

For priority consideration for merit-based scholarships, apply for admission by December 1 and complete a Free Application for Federal Student Aid (FAFSA) by February 1.

For more information on scholarships and financial aid, visit the Office of Student Financial Services (<https://www.slu.edu/financial-aid/>).

Learning Outcomes

1. An ability to identify, formulate, and solve complex structural engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply structural engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in structural engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions in structural engineering.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

8. An ability to design a system, component, or process using more than one structural engineering material.
9. An ability to explain basic concepts in management, business, public policy, and leadership.

Requirements

Code	Title	Credits
Undergraduate University Core (https://catalog.slu.edu/academic-policies/academic-policies-procedures/university-core/)		32-35
Major Requirements		
<i>Math</i>		
MATH 1510	Calculus I	4
MATH 1520	Calculus II	4
MATH 2530	Calculus III	4
MATH 3550	Differential Equations	3
STAT 3850	Foundation of Statistics	3
<i>Science</i>		
CHEM 1110 & CHEM 1115	General Chemistry 1 and General Chemistry 1 Laboratory	4
PHYS 1610 & PHYS 1620	University Physics I and University Physics I Laboratory	4
Science Elective with Lab		4
<i>Civil Engineering</i>		
CVNG 1000	Intro to Civil Engineering	2
CVNG 1001	Civil Engineering Modeling	2
CVNG 2020	GIS and Surveying in Civil Engineering Lab	1
CVNG 2070	Construction & Project Management	3
CVNG 2100 or MENG 2100X	Statics	3
CVNG 2500	Civil Engineering Computing	3
CVNG 3010	Structural Analysis	3
CVNG 3020	Structural Analysis Lab	1
CVNG 3030 & CVNG 3031	Civil Engineering Materials and Civil Engineering Materials Laboratory	3
CVNG 3090	Geotechnical Engineering	3
CVNG 3100	Geotechnical Engineering Lab	1
CVNG 3105X or MENG 3105	Mechanics of Solids	3
CVNG 3150 & CVNG 3160	Introduction to Structural Design and Structural Design Lab	4
CVNG 4050	Advanced Structural Analysis	3
CVNG 4070	Structural Dynamics	3
CVNG 4500	Capstone Design I	3
CVNG 4510	Capstone Design II	3
<i>Other Engineering</i>		
SE 1700	Engineering Fundamentals	2
ECE 1100	Electrical Engineering 101	2
ECE 1200	Computer Engineering 101	2
MENG 2150	Dynamics	3
MENG 3200	Fluid Dynamics	3
MENG 3510X or BME 3400	Materials Science	3

Focus Area Electives		12
Select 12 credits from the below:		
CVNG 4030	Foundation Engineering	
CVNG 4060	Structural Systems Design	
CVNG 4090	Advanced Reinforced Concrete	
CVNG 4110	Advanced Steel Design	
CVNG 4130	Bridge Engineering	
CVNG 4150	Prestressed Concrete	
CVNG 4100	Design of Masonry Structures	
CVNG 4120	Design of Timber Structures	
Professional Development Electives		6
Select 6 credits from the civil engineering department or courses from other departments that support the student's professional development goals with the chair's approval.		
Total Credits		126

Non-Course Requirements

All School of Science and Engineering B.A. and B.S. students must complete an exit interview/survey near the end of their bachelor's program.

Students are required to obtain the C- or better in designated prerequisite courses. Students who do not obtain a C- or better in a designated prerequisite course must retake the course and will not be permitted to progress to the following course(s).

Continuation Standards

Students are required to maintain a 2.00 overall GPA. Students whose overall GPA drops below 2.0 will be placed on academic probation.

Roadmap

Roadmaps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Courses and milestones designated as critical (marked with !) must be completed in the semester listed to ensure a timely graduation. Transfer credit may change the roadmap.

This roadmap should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor/mentor each semester. Requirements, course availability and sequencing are subject to change.

Course	Title	Credits
Year One		
Fall		
MATH 1510	Calculus I	4
CHEM 1110	General Chemistry I	3
CHEM 1115	General Chemistry I Laboratory	1
SE 1700	Engineering Fundamentals	2
CORE 1500	Cura Personalis 1: Self in Community	1
CORE 1200	Eloquentia Perfecta 2: Oral and Visual Communication	3
CORE 1900	Eloquentia Perfecta 1: Written and Visual Communication	3
Credits		17

Spring		
MATH 1520	Calculus II	4
PHYS 1610	University Physics I	3
PHYS 1620	University Physics I Laboratory	1
CVNG 1000	Intro to Civil Engineering	2
CVNG 1001	Civil Engineering Modeling	2
CORE 1600	Ultimate Questions: Theology	3
Credits		15

Year Two		
Fall		
MATH 2530	Calculus III	4
CVNG 2100	Statics	3
CVNG 2020	GIS and Surveying in Civil Engineering Lab	1
CVNG 2070	Construction & Project Management	3
CVNG 2500	Civil Engineering Computing	3
CORE 2500	Cura Personalis 2: Self in Contemplation	0
ECE 1200	Computer Engineering 101	2
Credits		16

Spring		
MATH 3550	Differential Equations	3
STAT 3850	Foundation of Statistics	3
CVNG 3105X	Mechanics of Solids	3
MENG 2150	Dynamics	3
CORE 1700	Ultimate Questions: Philosophy	3
ECE 1100	Electrical Engineering 101	2
Credits		17

Year Three		
Fall		
CVNG 3010	Structural Analysis	3
CVNG 3020	Structural Analysis Lab	1
CVNG 3030	Civil Engineering Materials	1
CVNG 3031	Civil Engineering Materials Laboratory	2
CVNG 4070	Structural Dynamics	3
MENG 3200	Fluid Dynamics	3
CORE 3400	Ways of Thinking: Aesthetics, History, and Culture	3
Credits		16

Spring		
CVNG 3090	Geotechnical Engineering	3
CVNG 3100	Geotechnical Engineering Lab	1
CVNG 3150	Introduction to Structural Design	3
CVNG 3160	Structural Design Lab	1
CVNG 4050	Advanced Structural Analysis	3
MENG 3510X	Materials Science	3
Credits		14

Year Four		
Fall		
CVNG 4500	Capstone Design I	3
Focus Area Electives		6
Professional Development Elective		3
Science Elective w/ Lab		4

CORE 4500	Reflection-in-Action	0
Credits		16
Spring		
CVNG 4510	Capstone Design II	3
Focus Area Electives		6
Professional Development Elective		3
CORE 3600	Ways of Thinking: Social and Behavioral Sciences	3
Credits		15
Total Credits		126

Contact Us

For more information, please contact:

Chris Carroll, Ph.D., P.E.
Department chair
chris.carroll@slu.edu