Civil Engineering

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Faculty:

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Civil Engineering (B.S.)

Program educational objectives are broad statements that describe what graduates are expected to attain within a few years of graduation. The program objectives are that our graduates will:

1. Be employed as engineers or be enrolled in engineering or professional graduate school;
2. Demonstrate their commitment to life-long learning and professional development through seeking professional licensure, pursuing graduate studies, or participating in other professional continuing education activities;
3. Advance into leadership roles in their profession and in service to their communities; and
4. Create design solutions that address economic, social, and environmental factors in their professional engineering practice

Student Outcomes

Graduates of the Civil Engineering program at Saint Louis University will demonstrate:

a. an ability to apply knowledge of mathematics, science, and engineering;
b. an ability to design and conduct experiments, as well as to analyze and interpret data;
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
d. an ability to function on multidisciplinary teams;
e. an ability to identify, formulate, and solve engineering problems;
f. an understanding of professional and ethical responsibility;
g. an ability to communicate effectively;
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
i. a recognition of the need for, and an ability to engage in life-long learning;
j. a knowledge of contemporary issues;
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
l. apply knowledge of four technical areas appropriate to civil engineering.

The Civil Engineering program at Saint Louis University is *future focused* – incorporating the latest trends in the Civil Engineering to address the current and future needs of the profession and our society. Our graduates will be well prepared to enter professional practice and will have the comprehensive skill set and leadership background needed to address society's needs at local, regional, and global scales. The Civil Engineering curriculum emphasizes professional practice preparation using *project-based*, *hands-on* learning methods.

Modern and well-equipped laboratories emphasize experimental methods and measurement techniques. The Civil Engineering laboratory facilities include a variety of equipment. In addition to the existing laboratory facilities in Oliver Hall, such as universal testing machines, vibration apparatus, and fluid dynamics laboratory; additional facilities include: soil mechanics, environmental, and construction materials testing laboratories. Students in the Civil Engineering program may specialize in areas such as infrastructure evaluation and design, transportation analysis and planning, and green engineering and sustainable design.

Degree Requirements

Basic Science & Math

CHEM 1110	General Chemistry I Lecture	3
CHEM 1115	General Chemistry I Lab	1
PHYS 1610	Engineering Physics I Lecture	3
PHYS 1620	Engineering Physics I Lab	1
MATH 1510	Calculus I	4
MATH 1520	Calculus II	4
MATH 2530	Calculus III	4
MATH 3550	Diff. Equations	3
STAT 3850	Foundations of Statistics	3

Math/Science Electives **7**

Choose 7 credits in Math or Science. The Math and Science elective cannot be a prerequisite course for required courses in the curriculum. Either BIOL 1240/1245 or an EAS course (or both) must be taken to satisfy the ABET basic science requirement. Acceptable EAS courses include EAS 2300, EAS 2110/2440, or EAS 2530. Courses for non-science majors and engineering courses will not be accepted. Contact the Faculty Mentor for approval of the Math/Science Electives choices.

Communications

ENGL 1920	Advanced Writing for Professionals	3
CMM 2200	Small Group Presentation	1

Liberal Arts

THEO 1000	Theological Foundations	3
PHIL 3400	Engineering Ethics	3
	Humanistic Values Electives	6
	Cultural Diversity Elective	3

Cultural Diversity elective courses must be selected from an approved Arts & Sciences list. See the description of the Parks College core above for more information.

Humanistic Values courses shall be chosen from: Humanities, Social & Behavioral Science, Philosophy, or Theology.

Humanities courses include: Fine Arts (excludes applied, studio, and performance courses), Literature, History, American Studies and Foreign Languages (excludes English or native language).

Social & Behavioral Sciences courses (3-credit) include: Anthropology,Communication, Communication Disorders, Economics, Education, Political Science, Psychology, Social Work, Sociology, Criminal Justice, and Public Policy Studies (excludes field service courses).

Engineering Science Courses

ESCI 2100	Statics	3
ESCI 2150	Dynamics	3
ESCI 3100	Mechanics of Solids	3
ESCI 3101	Mechanics of Solids Lab	1
ESCI 3200	Fluid Dynamics	3
ESCI 3201	Fluid Dynamics Lab	1

Civil Engineering Courses

All of the following courses will be offered only once a year.

CVNG 1010	Freshman Engineering I	1
CVNG 1020	Freshman Engineering II	1
CVNG 1500	Civil Engineering Computing	3
CVNG 2010	GIS and Surveying in Civil Engr.	
CVNG 2020	GIS and Surveying Lab	
CVNG 3030	Sustainability & Environmental Engr.	3
CVNG 3040	Sustainability & Envir. Engr. Lab	1
CVNG 3010	Structural Analysis	3
CVNG 3020	Structural Analysis Lab	1
CVNG 3030	Civil Engineering Materials	2
CVNG 3070	Engineering Project Management	2
CVNG 3090	Geotechnical Engineering	3
CVNG 3100	Geotechnical Engineering Lab	3
CVNG 3110	Transportation Engineering	3
CVNG 3120	Transportation Engineering Lab	1
CVNG 3130	Hydraulic Engineering	3
CVNG 3140	Hydraulic Engineering Lab	1
CVNG 3150	Introduction to Structural Design	3
CVNG 3160	Introduction to Structural Design Lab	1
CVNG 4500	Capstone Design I	3
CVNG 4510	Capstone Design II	3

Civil Engineering Electives

Nine (9) credits of Civil Engineering Electives are required from the available offerings above a 3000 level courses in our program. Some of the available civil engineering electives are:

CVNG 4030 Foundation Engineering
CVNG 4050 Advanced Structural Analysis
CVNG 4070 Structural Dynamics
CVNG 4090 Advanced Reinforced Concrete
CVNG 4110 Advanced Steel Design
CVNG 4130 Bridge Engineering
CVNG 4150 Prestressed Concrete
CVNG 4190 Sustainable Land Development Engrg.
CVNG 4210 Sustainable Water Management
CVNG 4330 Open-Channel Flow
CVNG 4350 Hydraulic Modeling
CVNG 4370 River Engineering
CVNG 4450 Traffic Engineering
CVNG 4470 Urban Transportation Planning

Professional Development Electives **12**

Six (6) credits of Professional Development Electives are required, typically upper level. They can be non- engineering courses, but must support professional development goals. Courses can be selected from pre-approved elective tracks or students can develop individualized plans with departmental approval.

Minimum **125**