

k-state

study guide

kansas state university

Civil Engineering

In the next decade, another billion people will be added to the earth's population. This growth creates enormous demands for facilities to produce energy, supply food, provide transportation, handle materials, dispose of wastes, clean the environment, and construct living and working spaces. The skills of civil engineers will, as always, be central to meeting these demands.

Civil engineering is the engineering of constructed facilities and systems: buildings, bridges, tunnels, dams, harbors, airports, waterways, highways, water power, irrigation, drainage, water supply, sewage, waste disposal, and environmental health systems.

As a rule, if a facility is one of a kind, large, and important in the daily lives of many people, chances are civil engineers participated in the planning, design, and construction of that facility.

General option

This allows for a general program covering the following major areas:

Environmental

Environmental engineering deals with the planning, design, and management of facilities and systems to protect public health and environmental quality. This includes the production and distribution of potable water and treatment and disposal of water from municipal, industrial, and agricultural activities.

Geotechnical

This area encompasses design and construction of foundations for structures, bridges, earth embankments, retaining walls and bulkheads, pavement for highways and airports, and waste containment structures.

Structural

Structural engineering deals with the design and construction of a wide variety of buildings and bridges, using concrete, steel, and other composite materials.

Transportation/materials

Transportation engineers are concerned with the planning, design, materials, construction, and operation of highways, railways, airports, and urban mass transit systems.

Water resources/ hydraulic engineering

Water resources engineers evaluate, design, construct, and manage structures and systems for flood control and to provide water for drinking and household uses, irrigation, power production, recreation and wildlife.

Construction engineering option

This option prepares you specifically for employment in the construction industry, such as with general or specialty contractors, construction divisions of major industrial concerns, or governmental agencies. Other employment areas might include financial lenders, equipment manufacturers, or material producers.

A student pursuing the construction engineering option within civil engineering can fulfill requirements for a BS in civil engineering by following the outlined course curriculum as well as the following selection of construction engineering courses :

Hrs.	Courses	
3	CE 542	Structural Engineering in Steel
3	CE 641	Civil Engineering Materials
3	CE 680	Economics of Design and Construction
8		Construction option electives
12		CE electives

Environmental engineering option

In this option, you are prepared for employment in the environmental field, specifically water and wastewater industries, regional and federal regulatory agencies, solid waste management, and pollution control industries.

A student pursuing the environmental option within the department can fulfill the requirements for a BS in civil engineering by following the outlined course curriculum listed for civil engineering as well as the following environmental engineering option electives:

Hrs.	Courses	
4	BIOL 198	Principles of Biology
3	CHM 531	Organic Chemistry I
10		Environmental option electives
12		CE electives

Structural engineering option

In this option, you are prepared for a career in structural engineering, consulting, government, or industry. Optional courses focus on the analysis and design of structures made of concrete, steel, and similar materials.

A student pursuing the structural option within the department can fulfill the requirements for a BS in civil engineering by completing the outlined course curriculum listed for civil engineering and the following required structural option courses:

Hrs.	Courses	
3	CE 411	Route Location and Design
3	CE 542	Structural Engineering in Steel
3	CE 732	Advanced Structural Analysis
8		Structures option electives
12		CE electives

Curriculum

The BS in civil engineering requires 128 semester hours.

Freshman

Hrs. Fall semester

4	MATH 220	Analytic Geometry and Calculus I
4	CHM 210	Chemistry I
3	ENGL 100	Expository Writing I
3	ECON 110	Principles of Macroeconomics I
2	ME 212	Engineering Graphics I
1	CE 101	Introduction to Civil Engineering
0	CE 015	Engineering Assembly
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Hrs. Spring semester

4	MATH 221	Analytic Geometry and Calculus II
4	CHM 230	Chemistry II
3	CIS 209	C Programming for Engineers
3	GEOL 100	Earth in Action
0	CE 015	Engineering Assembly
3		Option elective***
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Sophomore

Hrs. Fall semester

4	MATH 222	Analytic Geometry and Calculus III
5	PHYS 213	Engineering Physics I
2	COMM 105	Public Speaking IA
3	CE 212	Elementary Surveying
0	CE 015	Engineering Assembly
3		Option elective***
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Hrs. Spring semester

4	MATH 240	Elementary Differential Equations
5	PHYS 214	Engineering Physics II
3	CE 333	Statics
1	STAT 490	Statistics for Engineers I
1	DEN 325	Introduction to Personal and Professional Development
0	CE 015	Engineering Assembly
2		Option elective***
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Junior

Hrs. Fall semester

3	ME 512	Dynamics
3	ME 513	Thermodynamics I
3	CE 533	Mechanics of Materials
1	CE 534	Mechanics of Materials lab
0	CE 015	Engineering Assembly
6		Option elective***
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Hrs. Spring semester

3	CE 537	Introduction to Structural Analysis
3	ME 571	Fluid Mechanics
3	CE 522	Soil Mechanics I
3	CE 563	Environmental Engineering Fundamentals
3	ENGL 415	Written Communications for Engineers*
0	CE 015	Engineering Assembly
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Senior

Hrs. Fall semester

6		Civil engineering electives****
3	CE 550	Water Resources Engineering I
3		General education humanities or general education social sciences electives**
3		Option electives***
0	CE 015	Engineering Assembly
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Hrs. Spring semester

3	CE 585	Civil Engineering Project
6		Civil engineering electives****
6		General education humanities or general education social sciences electives**
0	CE 015	Engineering Assembly
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*Students must complete the appropriate prerequisite credits for ENGL 415 but may apply only 3 hours of prerequisite credits toward degree requirements.

**General education humanities and general education social sciences electives are to be selected from university general education courses that are also on the engineering humanities and social sciences elective list and need not be taken in the order listed in the curriculum.

***Option electives are to be selected in consultation with the student's faculty advisor to satisfy the requirements of the option the student has chosen. One course from either the engineering materials or the circuits, fields, and electronics engineering science group is required in the general option.

****CE electives are to be selected from the list approved by the department to satisfy option requirements.

For more information about civil engineering, contact:

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