Civil Engineering, BSE

Requirements

The Bachelor of Science in Engineering (BSE) with a major in civil engineering requires a minimum of 128 s.h. of credit. At the time of graduation, students must have a cumulative grade-point average of at least 2.00 in all college work used to complete degree requirements and in all UI coursework in order to be awarded the BSE.

All BSE students are required to take the same collegiate curriculum. For information about these collegiate requirements, see the Bachelor of Science in Engineering, BSE in the catalog. Students completing the major in civil engineering fulfill the collegiate statistics requirement by completing STAT:2020 Probability and Statistics for the Engineering and Physical Sciences. Some focus areas may suggest or require specific courses to fulfill the General Education Component of the collegiate curriculum; see "Focus Area" below.

The major in civil engineering requires the following coursework. Students who begin in the college fall semester of their first year also complete ENGR:1000 Engineering Success for First-Year Students (1 s.h.). Students who have transferred into the College of Engineering or did not complete ENGR:1000 their first year are required to substitute the seminar with a different course; depending on the student's major, the college may waive this requirement. Students transferring from the College of Liberal Arts and Sciences or Tippie College of Business typically use 1 s.h. from CSI:1600 Success at Iowa to cover this requirement.

Requirements	Hours
Collegiate Curriculum	49
Major Requirements	58
Focus Area	21-22

Major Requirements

Major requirements include a set of common courses (45 s.h.), four professional skills courses (4 s.h.), two design courses (6 s.h.), and one capstone design course (3 s.h.).

Common Courses

Course #	Title	Hours
All of these:		
CEE:1030	Introduction to Earth Science (no lab required)	3
CEE:2015	Civil Engineering Tools	2
CEE:3155	Principles of Environmental Engineering	4
CEE:3371	Principles of Hydraulics and Hydrology	3
CEE:3530	Geomechanics	4
CEE:3533	Principles of Structural Engineering	4
CEE:3586	Civil Engineering Materials	3
CEE:3763	Principles of Transportation Engineering	3
ENGR:2110	Statics	2
ENGR:2130	Thermodynamics	3
ENGR:2510	Fluid Mechanics	4
ENGR:2710	Dynamics	3
ENGR:2750	Mechanics of Deformable Bodies	3
And one of these:		
CHEM:1120	Principles of Chemistry II	4
PHYS:1612	Introductory Physics II (with lab)	4

Professional Skills

Course #	Title	Hours
All of these:		
CEE:2010	Civil and Environmental Engineering Professional Practice and Ethics	1
CEE:3001	Leadership Skills for Engineers	1
CEE:3002	Technical Communication in Civil and Environmental Engineering	1
CEE:3003	Project Management Skills	1

Design Courses

Some focus areas require specific courses to fulfill part of this requirement; see "Focus Area" below. Students cannot count both CEE:4506 Design of Concrete Structures and CEE:4535 Design of Steel Structures towards the design requirement for the major.

Course #	Title	Hours
Two of these:		
CEE:4157	Environmental Engineering Design	3
CEE:4374	Water Resource Design	3
CEE:4506	Design of Concrete Structures	3
or CEE:4535	Design of Steel Structures	
CEE:4762	Design of Transportation Systems	3

Capstone Design Course

Course #	Title	Hours
This course:		
CEE:4850	Project Design and Management in Civil Engineering	3

Focus Area

Students must select focus area courses according to guidelines established by the Department of Civil and Environmental Engineering. Civil engineering students may choose from several standard focus areas developed by the department or create an individual focus area tailored to their interests.

Standard focus areas are offered in the broad field of civil practice [p. 2] and in the four technical areas: environmental engineering [p. 2]; hydraulics and water resources [p. 2]; structures, mechanics, and materials [p. 4]; and transportation engineering [p. 5]. Other areas of focus include informatics [p. 3], management [p. 3], pre-architecture [p. 4], and urban studies

[p. 5]. To see guidelines related to tailored focus areas, visit Civil Engineering Focus Areas on the Department of Civil and Environmental Engineering website.

Focus areas in civil engineering consist of content area courses, design courses, and elective courses; carefully selected elective courses may contribute to earning a minor and/or certificate. Some focus areas also may suggest or require specific courses to fulfill the design requirement of the major curriculum or the General Education Component of the collegiate curriculum.

Civil Practice

Students complete five civil and environmental engineering electives (15 s.h.) and two additional elective courses (6 s.h.).

Civil and Environmental Engineering Electives

Students complete 15 s.h. in civil and environmental engineering electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) not already taken for the major numbered 3000 or above.

It is recommended that students select from the following courses.

Course #	Title	Hours
CEE:3783	Surveying and Remote Sensing	3
CEE:3790	Resilient Infrastructure and Emergency Response	3
CEE:4102	Groundwater	3
CEE:4119	Hydrology	3
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
CEE:4159/ CBE:4459/IGPI:4159	Air Pollution Control Technology	3
CEE:4371	Water Resources Engineering	3
CEE:4539	Foundations of Structures	3
CEE:4763	Traffic Engineering	3

Additional Electives–Civil Practice

Students complete 6 s.h. in additional electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) numbered 3000 or above and not already taken for the major, or preapproved courses taken outside of the College of Engineering; see PreApproved Non-Engineering Electives [p. 6] in this section of the catalog. Students should consult with an academic advisor.

The following courses are suggested electives in the civil practice focus area.

Course #	Title	Hours
ENGR:2120	Electrical Circuits	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3

Environmental Engineering

Students complete one required course (4 s.h.), four focus area electives (12 s.h.), and two additional elective courses (6 s.h.).

Students in the environmental engineering focus area are required to complete CEE:4157 Environmental Engineering Design as one of their design courses for the civil engineering major. The second design course may be selected from the approved list; see "Design Courses" above.

Required Environmental Course

Course #	Title	Hours
This course:		
CEE:3430	Water Treatment	4

Environmental Electives

Course #	Title	Hours
Four of these:		
CEE:4102	Groundwater	3
CEE:4107/CBE:4410	Sustainable Systems	3
CEE:4119	Hydrology	3
CEE:4150/CBE:4420	Environmental Chemistry	3
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
CEE:4159/ CBE:4459/IGPI:4159	Air Pollution Control Technology	3

Additional Electives–Environmental Engineering

Students complete 6 s.h. in additional electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) numbered 3000 or above and not already taken for the major, or preapproved courses taken outside of the College of Engineering; see Preapproved Non-Engineering Electives [p. 6] in this section of the catalog. Students should consult with an academic advisor.

The following courses are suggested electives in the environmental engineering focus area.

Course #	Title	Hours
ENGR:2120	Electrical Circuits	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3

Hydraulics and Water Resources

Students complete two required courses (6 s.h.), three focus area electives (9–10 s.h.), and two additional elective courses (6 s.h.).

Students in the hydraulics and water resources focus area are required to complete CEE:4374 Water Resource Design as one of their design courses for the civil engineering major. The second design course may be selected from the approved list; see "Design Courses" above.

Required Hydraulics and Water Resources Courses

Course #	Title	Hours
Both of these:		
CEE:4119	Hydrology	3
CEE:4371	Water Resources Engineering	3

Hydraulics and Water Resources Electives

Course #	Title	Hours
Three of these:		
CEE:3430	Water Treatment	4
CEE:3783	Surveying and Remote Sensing	3
CEE:4102	Groundwater	3
CEE:4107/CBE:4410	Sustainable Systems	3
CEE:4157	Environmental Engineering Design	3
CEE:4180	Fundamentals of Atmospheric Science	3
CEE:4370	Open Channel Flow and Sediment Transport	3

Additional Electives–Hydraulics and Water Resources

Students complete 6 s.h. in additional electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) numbered 3000 or above and not already taken for the major, or preapproved courses taken outside of the College of Engineering; see Preapproved Non-Engineering Electives [p. 6] in this section of the catalog. Students should consult with an academic advisor.

The following courses are suggested electives in the hydraulics and water resources focus area.

Course #	Title	Hours
ENGR:2120	Electrical Circuits	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3

Informatics

Students complete three required courses (10 s.h.), two focus area electives (6 s.h.), and two additional electives (6 s.h.).

Required Informatics Courses

Course #	Title	Hours
All of these:		
CS:2110	Programming for Informatics	4
CS:2420	Analyzing Data for Informatics	3
CS:2520	Human-Computer Interaction for Informatics	3

Informatics Electives

Course #	Title	Hours
Two of these:		
CEE:3783	Surveying and Remote Sensing	3
CEE:3790	Resilient Infrastructure and Emergency Response	3
CEE:4102	Groundwater	3
CEE:4119	Hydrology	3
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
CEE:4159/ CBE:4459/IGPI:4159	Air Pollution Control Technology	3
CEE:4371	Water Resources Engineering	3
CEE:4539	Foundations of Structures	3
CEE:4763	Traffic Engineering	3
An additional course with prefix CEE numbered 3000 or above		3

Additional Electives–Informatics

Students complete 6 s.h. in additional electives.

Course #	Title	Hours
Two of these:		
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3
An additional design course; see "Design Courses" above		3
An additional course with prefix CEE		3

Management

Students complete five required courses (15 s.h.) and two additional elective courses (6 s.h.). Students in the management focus area must complete the minor in business administration in the Tippie College of Business; this typically requires additional coursework outside of the civil engineering major.

Required Management Courses

Course #	Title	Hours
All of these:		
ACCT:2100	Introduction to Financial Accounting	3
ACCT:2200	Managerial Accounting Analytics and Data Visualization	3
FIN:3000	Introductory Financial Management	3
or ISE:2500	Engineering Economy	
MGMT:2100	Introduction to Management	3
MKTG:3000	Introduction to Marketing Strategy	3

Additional Electives–Management

Students complete 6 s.h. in additional electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) numbered

3000 or above and not already taken for the major. Students should consult with an academic advisor.

The following courses are suggested electives in the management focus area.

Course #	Title	Hours
CEE:3783	Surveying and Remote Sensing	3
CEE:3790	Resilient Infrastructure and Emergency Response	3
CEE:4102	Groundwater	3
CEE:4119	Hydrology	3
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
CEE:4159/ CBE:4459/IGPI:4159	Air Pollution Control Technology	3
CEE:4371	Water Resources Engineering	3
CEE:4539	Foundations of Structures	3
CEE:4763	Traffic Engineering	3

Pre-Architecture

Students complete one required course (3 s.h.), one pre-architecture elective (3 s.h.), two structures electives (6 s.h.), one civil and environmental engineering elective (3 s.h.), and two art electives (6 s.h.). Students in the pre-architecture focus area must complete the minor in art in the College of Liberal Arts and Sciences; this typically requires additional coursework outside of the civil engineering major.

Students in the pre-architecture focus area are required to take CEE:4506 Design of Concrete Structures as one of their design courses for the civil engineering major. The second design course may be selected from the approved list, with the exception of CEE:4535 Design of Steel Structures; see "Design Courses" above.

Required Pre-Architecture Course

Course #	Title	Hours
This course:		
TDSN:2210	Introduction to 3D Design	3

Pre-Architecture Elective

Course #	Title	Hours
One of these:		
DRAW:2310	Life Drawing I	3
DSGN:2500	Graphic Design I	3
PHTO:2600	Photography I	3
PNTG:2410	Painting I	3
PRNT:2610	Introduction to Printmaking	3

Structures Electives

Course #	Title	Hours
Two of these:		
CEE:4164	Design of Wood Structures	3
CEE:4535	Design of Steel Structures	3
CEE:4539	Foundations of Structures	3

Civil and Environmental Engineering Elective

Course #	Title	Hours
One of these:		
A third structures course; see "Structures Electives" above		3
An additional design course; see "Design Courses" above		3
An additional course with prefix CEE numbered 3000 or above		3

Art Electives

Students complete 6 s.h. in additional electives chosen from courses that count toward the art minor in the College of Liberal Arts and Sciences. Students should consult with an academic advisor.

The following courses are suggested electives in the pre-architecture focus area.

Course #	Title	Hours
CEE:2240/ TDSN:2240	Digital Drafting with AutoCAD	3
CERM:2010	Ceramics I: Handbuilding	3
INTM:2710/ CINE:2869	Introduction to Intermedia	3
MTLS:2910	Introduction to Jewelry and Metal Arts	3
SCLP:2810	Undergraduate Sculpture I	3
TDSN:2250	Digital Prototyping	3

Structures, Mechanics, and Materials

Students complete CEE:4535 Design of Steel Structures, four focus area electives (12 s.h.), and two additional elective courses (6 s.h.).

Students in the structures, mechanics, and materials focus area are required to take CEE:4506 Design of Concrete Structures as one of their design courses for the civil engineering major. The second design course may be selected from the approved list; see "Design Courses" above.

Required Structures, Mechanics, and Materials Course

Course #	Title	Hours
This course:		
CEE:4535	Design of Steel Structures	3

Structures, Mechanics, and Materials Electives

Course #	Title	Hours
12 s.h. from these:		
CEE:3783	Surveying and Remote Sensing	3
CEE:4135/ BME:4135/ME:4235	Health Monitoring of Structural and Mechanical Systems	3
CEE:4160	Introduction to Bridge Engineering	3
CEE:4162	Structural Systems for Buildings	3
CEE:4164	Design of Wood Structures	3

CEE:4511/ME:4111	Scientific Computing and Machine Learning	3
CEE:4512/ME:4112	Engineering Design Optimization	3
CEE:4532/ME:4153	Fundamentals of Vibrations	3
CEE:4533/IGPI:4115	Finite Element I	3
CEE:4539	Foundations of Structures	3
CEE:5179/ME:5179	Continuum Mechanics	arr.
CEE:5236/ BME:5720	Optimization of Structural Systems	3
CEE:5540/ME:5150	Intermediate Mechanics of Deformable Bodies	3

Additional Electives–Structures, Mechanics, and Materials

Students complete 6 s.h. in additional electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) numbered 3000 or above and not already taken for the major, or preapproved courses taken outside of the College of Engineering; see Preapproved Non-Engineering Electives [p. 6] in this section of the catalog. Students should consult with an academic advisor.

The following courses are suggested electives in the structures, mechanics, and materials focus area.

Course #	Title	Hours
ENGR:2120	Electrical Circuits	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3

Transportation Engineering

Students complete five focus area electives (15 s.h.), and two additional elective courses (6 s.h.).

Students in the transportation engineering focus area are required to take CEE:4762 Design of Transportation Systems as one of their design courses for the civil engineering major. The second design course may be selected from the approved list; see "Design Courses" above.

Transportation Electives

Course #	Title	Hours
15 s.h. from these:		
CEE:3142/ISE:3600/ STAT:3620	Quality Control	3
CEE:3783	Surveying and Remote Sensing	3
CEE:3790	Resilient Infrastructure and Emergency Response	3
CEE:3998	Individual Investigations: Civil Engineering	arr.
CEE:4160	Introduction to Bridge Engineering	3
CEE:4176/URP:4262	Transportation Research Methods and Analysis	3
CEE:4560	Pavement Engineering	3
CEE:4730	Transportation Infrastructure Construction and Management	3
CEE:4763	Traffic Engineering	3
CEE:5678/URP:5678	Application Simulation to Transportation	3

Additional Electives–Transportation Engineering

Students complete 6 s.h. in additional electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) numbered 3000 or above and not already taken for the major, or preapproved courses taken outside of the College of Engineering; see Preapproved Non-Engineering Electives [p. 6] in this section of the catalog. Students should consult with an academic advisor.

The following courses are suggested electives in the transportation engineering focus area.

Course #	Title	Hours
ENGR:2120	Electrical Circuits	3
ENGR:2720	Materials Science	3
ENGR:2730	Computers in Engineering	3
ENGR:3110	Introduction to Artificial Intelligence and Machine Learning in Engineering	3
ISE:2500	Engineering Economy	3

Urban Studies

Students complete one required course (3 s.h.), four focus area electives (12 s.h.), and two additional elective courses (6 s.h.).

Students planning to pursue the combined Bachelor of Science in Engineering/Master of Science program in urban and regional planning should complete URP:6202 Land Use Planning: Law and Practice and URP:6203 The Making of Cities: Histories and Theories of Planning. These courses can be counted toward the collegiate curriculum General Education Component approved course subjects requirement. See Combined Programs [p.] in this section of the catalog.

Required Urban Studies Course

Course #	Title	Hours
This course:		
URP:3001/ GEOG:3920	Planning Livable Cities	3

Urban Studies Electives

In addition to the courses listed below, students also may select courses that fulfill requirements for the minor in urban studies.

Course #	Title	Hours
12 s.h. from these:		
CRIM:4120	Environmental Criminology	3
PBAF:3560/ POLI:3560/ RHET:3560/ SJUS:3560	Public Policy and Persuasion	3
PBAF:3570/ GHS:3570/ POLI:3570	Poverty Policy	3
URP:2020/ PBAF:2020	Environment and Society: Sustainability, Policy, and Politics	3

URP:4170	Megacities Seminar	1-3
URP:4225/ PBAF:4225	Applied GIS for Planning and Policy Making	3
URP:4253/ PBAF:4253	Designing Sustainable and Healthy Cities	1-3
URP:4260/ PBAF:4260	Transportation Policy and Planning	3
URP:4266/ PBAF:4266	Transportation, Urban Form, and Sustainability	3
URP:4273/ PBAF:4273	Community Development Through Creative Placemaking	3
URP:4280/ PBAF:4280	Planning for Disaster Mitigation and Recovery	2-3
URP:4295	Economic Development Policy	3

Additional Electives–Urban Studies

Students complete 6 s.h. in additional electives. These electives may include any Department of Civil and Environmental Engineering course (prefix CEE) numbered 3000 or above and not already taken for the major. Students should consult with an academic advisor.

The following courses are suggested electives in the urban studies focus area.

Course #	Title	Hours
CEE:3783	Surveying and Remote Sensing	3
CEE:3790	Resilient Infrastructure and Emergency Response	3
CEE:4102	Groundwater	3
CEE:4119	Hydrology	3
CEE:4158/ OEH:4920	Solid and Hazardous Wastes	3
CEE:4159/ CBE:4459/IGPI:4159	Air Pollution Control Technology	3
CEE:4371	Water Resources Engineering	3
CEE:4539	Foundations of Structures	3
CEE:4763	Traffic Engineering	3

Preapproved Non-Engineering Electives

Students pursuing a technical focus area (civil practice; environmental engineering; hydraulics and water resources; structures, mechanics, and materials; and transportation) may also choose from the following courses to satisfy their additional electives.

Course #	Title	Hours
CEE:2240/ TDSN:2240	Digital Drafting with AutoCAD	3
CEE:3328/EES:3380	Fluvial Geomorphology	3
CPH:3400/ GEOG:3210	Health, Work, and the Environment	3
ECON:3625/ URP:3135	Environmental and Natural Resource Economics	3
EES:3360/ GEOG:3360	Soil Genesis and Geomorphology	3
EES:3390	Integrated Watershed Analysis	3
GEOG:1070	Contemporary Environmental Issues	3
GEOG:2050	Foundations of GIS	4
GEOG:3520/ IGPI:3520	GIS for Environmental Studies	3
LAW:8992	Water Law	arr.
OEH:4240	Global Environmental Health	3
URP:3350/ ECON:3750/ GEOG:3940	Transportation Economics	3