CIVIL ENGINEERING, BS

for the degree of Bachelor of Science in Civil Engineering

department website: Department of Civil & Environmental Engineering (https://cee.illinois.edu)
department faculty: Department of Civil & Environmental Engineering Faculty (https://cee.illinois.edu/directory/faculty)
overview of college admissions & requirements: The Grainger College of Engineering (https://grainger.illinois.edu/admissions)
college website: https://grainger.illinois.edu/

Civil engineering is a profession that applies the basic principles of science in conjunction with mathematical and computational tools to solve problems associated with developing and sustaining civilized life on our planet. Civil engineering works are generally one-of-a-kind projects; they are often grand in scale; and they usually require cooperation among professionals of many different disciplines. The completion of a civil engineering project involves the solution of technical problems in which uncertainty of information and myriad non-technical factors often play a significant role. Some of the most common examples of civil engineering works include bridges, buildings, dams, airports, highways, tunnels, and water distribution systems. Civil engineers are concerned with flood control, landslides, air and water pollution, and the design of facilities to withstand earthquakes and other natural hazards, in addition to protecting our environment for a sustainable future.

The civil engineering program comprises seven areas (construction engineering and management, construction materials engineering, environmental engineering, geotechnical engineering, environmental hydrology and hydraulics, structural engineering, and transportation engineering) and three interdisciplinary programs (sustainable and resilient infrastructure systems; energy, water, and environmental sustainability; and societal risk and hazard mitigation). Although each area has its own special body of knowledge and engineering tools, they all rely on the same fundamental core principles. Civil engineering projects often draw expertise from many of these areas and programs.

CEE's Program Education Objectives are to educate CEE students to:

1. Successfully enter the civil and environmental engineering profession as practicing engineers and consultants with prominent companies and organizations in diverse areas that include structural, transportation, geotechnical, materials, environmental, and hydrologic engineering; construction management; or other related or emerging fields.
2. Pursue graduate education and research at major research universities in civil and environmental engineering, and related fields.
3. Pursue professional licensure.
4. Advance to leadership positions in the profession.
5. Engage in continued learning through professional development.
6. Participate in and contribute to professional societies and community services.

Program Review and Approval

To qualify for the degree of Bachelor of Science in Civil Engineering, each student's academic program plan must be reviewed by a standing committee of the faculty (the Program Review Committee) and approved by the Associate Head of Civil and Environmental Engineering in charge of undergraduate programs. This review and approval process ensures that individual programs satisfy the educational objectives and all of the requirements of the civil engineering program, that those programs do not abuse the substantial degree of flexibility that is present in the curriculum, and that the career interests of each student are cultivated and served.

for the degree of Bachelor of Science in Civil Engineering

Graduation Requirements

Minimum Overall GPA: 2.0
Minimum hours required for graduation: 128 hours
General education: Students must complete the Campus General Education (https://courses.illinois.edu/gened/DEFAULT/DEFAULT) **requirements including the campus general education language requirement. One of the SBS courses must be an introductory economics course (ECON 102 or ECON 103). The Advanced Composition course must be BTW 261.**

Orientation and Professional Development

Code	Title	Hours
CEE 195	About Civil Engineering	1
CEE 495	Professional Practice	0
ENG 100	Engineering Orientation [1]	0
Total Hours		1

Foundational Mathematics and Science

Code	Title	Hours
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1
CHEM 104	General Chemistry II	3
CHEM 105	General Chemistry Lab II	1
MATH 221	Calculus I [2]	4
MATH 225	Introductory Matrix Theory	2
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 285	Intro Differential Equations	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 213	Univ Physics: Thermal Physics	2
Total Hours		34

Civil Engineering Technical Core

Code	Title	Hours
CEE 201	Systems Engrg & Economics	3
CEE 202	Engineering Risk & Uncertainty	3
CS 101	Intro Computing: Engrg & Sci	3
SE 101	Engineering Graphics & Design	3
TAM 211	Statics	3
TAM 212	Introductory Dynamics	3
TAM 251	Introductory Solid Mechanics	3
TAM 335	Introductory Fluid Mechanics	4
Total Hours		25

Science Elective

Code	Title	Hours
Science elective, selected in accord with recommendations for the chosen primary field in civil engineering.		3
ATMS 120	Severe and Hazardous Weather	3
CHBE 321	Thermodynamics	4
CHEM 222	Quantitative Analysis Lecture	2
CS 357	Numerical Methods I	3
ECE 205	Electrical and Electronic Circuits	3
GEOL 107	Physical Geology	4
GEOL 118	Natural Disasters	3
ME 200	Thermodynamics	3
STAT 420	Methods of Applied Statistics	3 or 4

Civil Engineering Technical Electives

Students choose primary and secondary fields, of which there are seven traditional areas of study and three interdisciplinary programs. The specific choices of courses in this category are made through the submission of a Plan of Study, which is subject to approval by the faculty Program Review Committee.

Code	Title	Hours
Civil engineering technical courses, selected as follows, to at least include:		34
Civil Engineering Core Courses		
The courses that are required and recommended for the primary and secondary fields are listed below. Select at least 5 courses from the following list:		15-16
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Primary Field Advanced Technical Electives. Select courses from approved lists for appropriate programs of study within the seven areas or three interdisciplinary programs of civil engineering. Design experience is distributed in 200-level, 300-level, and 400-level CEE courses including integrated design courses. See list below:		12-13
Construction Engineering and Management		
Science Electives Required - NONE		
Science Electives Recommended - See below:		
ATMS 120	Severe and Hazardous Weather	3
ATMS 303	Synoptic-Dynamic Wea Analysis	4
ECE 205	Electrical and Electronic Circuits	3
FIN 221	Corporate Finance	3
GEOL 107	Physical Geology	4
GEOL 118	Natural Disasters	3
GEOL 333	Earth Materials and the Env	4
GEOL 380	Environmental Geology	4
ME 200	Thermodynamics	3
NPRE 201	Energy Systems	2 or 3
SE 400	Engineering Law	3 or 4
STAT 420	Methods of Applied Statistics	3 or 4
UP 205	Ecology & Environmental Sustainability	3
Civil Engineering Core Courses:		
CEE 300	Behavior of Materials	4
CEE 320	Construction Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Civil Engineering Core Courses Recommended- None		
Advanced Technical Courses - Required:		
CEE 420	Construction Productivity	3 or 4
CEE 421	Construction Planning (Required Integrated Design Course)	3 or 4
CEE 422	Construction Cost Analysis	3 or 4
CEE 461	Reinforced Concrete I	3
Advanced Technical Courses - Recommended:		
CEE 401	Concrete Materials	4
CEE 424	Sustainable Const Methods	4
CEE 460	Steel Structures I	3
CEE 469	Wood Structures	3 or 4
CEE 480	Foundation Engineering	3
Construction Materials Engineering		
Science Electives Required - None		
Science Electives Recommended:		
GEOL 107	Physical Geology	4
ME 430	Failure of Engrg Materials	3 or 4
MSE 201	Phases and Phase Relations	3
TAM 427	Mechanics of Polymers	3
TAM 428	Mechanics of Composites	3
Civil Engineering Core Courses Required:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
Civil Engineering Core Courses Recommended:		
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses Required:		
CEE 401	Concrete Materials (Required Integrated Design Course)	4
CEE 405	Asphalt Materials I	3 or 4
Advanced Technical Courses Recommended:		
CEE 406	Pavement Design I	3 or 4
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 469	Wood Structures	3 or 4
CEE 483	Soil Mechanics and Behavior	4
MSE 401	Thermodynamics of Materials	3
MSE 402	Kinetic Processes in Materials	3
MSE 406	Thermal-Mech Behavior of Matls	3
MSE 420	Ceramic Materials & Properties	3
MSE 450	Polymer Science & Engineering	3 or 4
Environmental Engineering		
Science Electives Required - None		

Science Electives Recommended:		
CHEM 222	Quantitative Analysis Lecture	2
CHEM 232	Elementary Organic Chemistry I	3 or 4
CS 357	Numerical Methods I	3
GEOL 107	Physical Geology	4
MCB 300	Microbiology	3
ME 200	Thermodynamics	3
MSE 401	Thermodynamics of Materials	3
STAT 420	Methods of Applied Statistics	3 or 4
Civil Engineering Core Courses Required:		
CEE 330	Environmental Engineering	3
Civil Engineering Core Courses Recommended:		
CEE 350	Water Resources Engineering	3
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses Required - At least one of:		
CEE 437	Water Quality Engineering	3
CEE 440	Fate Cleanup Environ Pollutant	4
CEE 445	Air Quality Modeling	4
CEE 446	Air Quality Engineering	4
Advanced Technical Course Recommended:		
CEE 430	Ecological Quality Engineering	2
CEE 434	Environmental Systems I	3
CEE 438	Science & Environmental Policy	3
CEE 442	Environmental Engineering Principles, Physical	4
CEE 443	Env Eng Principles, Chemical	4
CEE 444	Env Eng Principles, Biological	4
CEE 445	Air Quality Modeling	4
CEE 447	Atmospheric Chemistry	4
CEE 449	Environmental Engineering Lab (Required Integrated Design Course)	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
Geotechnical Engineering		
Science Electives Required:		
GEOL 107	Physical Geology	4
Science Electives Recommended:		
GEOL 333	Earth Materials and the Env	4
GEOL 380	Environmental Geology	4
GEOL 401	Geomorphology	4
GEOL 411	Structural Geol and Tectonics	4
GEOL 440	Sedimentology and Stratigraphy	4
GEOL 470	Introduction to Hydrogeology	4
Civil Engineering Core Courses Required:		
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Civil Engineering Core Courses Recommended:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
Advanced Technical Courses Required:		
CEE 483	Soil Mechanics and Behavior	4
CEE 484	Applied Soil Mechanics (Required Integrated Design Course)	3 or 4
Advanced Technical Courses Recommended:		
CEE 457	Groundwater	3
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 463	Reinforced Concrete II	3 or 4
Structural Engineering		
Science Electives Required - None		
Science Electives Recommended:		
CS 357	Numerical Methods I	3
ECE 205	Electrical and Electronic Circuits	3
GEOL 107	Physical Geology	4
GEOL 118	Natural Disasters	3
ME 200	Thermodynamics	3
Civil Engineering Core Courses:		
CEE 300	Behavior of Materials	4
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Civil Engineering Core Courses Recommended:		
CEE 320	Construction Engineering	3
Advanced Technical Courses Required:		
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 465	Design of Structural Systems (Required Integrated Design Course)	3
CEE 470	Structural Analysis	4
Advanced Technical Courses Recommended - None		
Transportation Engineering		
Science Electives Required - None		
Science Electives Recommended:		
CS 357	Numerical Methods I	3
ECE 205	Electrical and Electronic Circuits	3
GEOL 107	Physical Geology	4
ME 200	Thermodynamics	3
ME 340	Dynamics of Mechanical Systems	3.5
MSE 401	Thermodynamics of Materials	3
SE 320	Control Systems	4
STAT 420	Methods of Applied Statistics	3 or 4
Civil Engineering Core Courses Required:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
Civil Engineering Core Courses Recommended:		
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3

Advanced Technical Courses: You must select one course from each of the three Areas below and one course from the recommended list.

Area 1 - Facilities		
CEE 405	Asphalt Materials I	3 or 4
CEE 406	Pavement Design I	3 or 4
CEE 407	Airport Design	3 or 4
Area 2 - Systems:		
CEE 407	Airport Design	3 or 4
CEE 415	Geometric Design of Roads (Required Integrated Design Course)	4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 418	Public Transportation Systems	3 or 4
Area 3 - Railroad:		
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 411	RR Project Design & Constr	3 or 4
Recommended:		
CEE 401	Concrete Materials	4
CEE 405	Asphalt Materials I	3 or 4
CEE 406	Pavement Design I	3 or 4
CEE 407	Airport Design	3 or 4
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 411	RR Project Design & Constr	3 or 4
CEE 412	High-Speed Rail Engineering	3 or 4
CEE 415	Geometric Design of Roads	4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 418	Public Transportation Systems	3 or 4
Water Resources Engineering and Science		
Science Electives Required - None		
Science Electives Recommended:		
CS 357	Numerical Methods I	3
GEOL 107	Physical Geology	4
ME 200	Thermodynamics	3
Civil Engineering Core Courses Required:		
CEE 350	Water Resources Engineering	3
Civil Engineering Core Courses Recommended:		
CEE 300	Behavior of Materials	4
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses Required (Choose one):		
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics (Required Integrated Design Course)	4
Advanced Technical Courses Recommended:		
CEE 432	Stream Ecology	3 or 4
CEE 433	Water Technology and Policy	3 or 4
CEE 434	Environmental Systems I	3
CEE 437	Water Quality Engineering	3
CEE 450	Surface Hydrology	3
CEE 451	Environmental Fluid Mechanics	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 458	Water Resources Field Methods	4
CEE 498	Special Topics (Section EH)	1 to 4
Energy-Water-Environment Sustainability		
Science Electives Required:		
ME 200	Thermodynamics	3-4
or CHBE 321	Thermodynamics	
Science Electives Recommended - None		
Civil Engineering Core Courses Required:		
CEE 340	Energy and Global Environment	3
Civil Engineering Core Courses Recommended:		
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
Advanced Technical Courses Required:		
CEE 493	Sustainable Design Eng Tech (Must also select 3 courses from recommended list below)	4
Advanced Technical Courses Recommended:		
ABE 436	Renewable Energy Systems	3 or 4
ARCH 441	Heat and Moisture in Buildings	3
CEE 424	Sustainable Const Methods	4
CEE 433	Water Technology and Policy	3 or 4
CEE 434	Environmental Systems I	3
CEE 437	Water Quality Engineering	3
CEE 446	Air Quality Engineering	4
CEE 449	Environmental Engineering Lab	3
CEE 450	Surface Hydrology	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 498	Special Topics (Section EH)	1 to 4
ENG 471	Seminar Energy & Sustain Engrg	1
ME 400	Energy Conversion Systems	3 or 4
NPRE 402	Nuclear Power Engineering	3 or 4
NPRE 475	Wind Power Systems	3 or 4
Societal Risk and Hazard Mitigation		
Science Electives Required - None		
Science Electives Recommended:		
FIN 230	Introduction to Insurance	3
GEOL 118	Natural Disasters	3
LAW 301	Introduction to Law	2 or 3
NRES 287	Environment and Society	3
STAT 420	Methods of Applied Statistics	3 or 4
Civil Engineering Core Courses Required:		
CEE 340	Energy and Global Environment	3
Civil Engineering Core Courses Recommended:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3

CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses Required:		
CEE 491	Decision and Risk Analysis (and select 3 from the recommended list below)	3 or 4
Advanced Technical Courses Recommended:		
CEE 406	Pavement Design I	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 437	Water Quality Engineering	3
CEE 440	Fate Cleanup Environ Pollutant	4
CEE 449	Environmental Engineering Lab	3
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 465	Design of Structural Systems	3
CEE 472	Structural Dynamics I	3 or 4
CEE 498	Special Topics (Section WE)	1 to 4
IE 410	Advanced Topics in Stochastic Processes & Applications	3 or 4
NPRE 442	Radioactive Waste Management	3
SE 450	Decision Analysis I	3 or 4
STAT 425	Applied Regression and Design	3 or 4
STAT 429	Time Series Analysis	3 or 4
STAT 430	Topics in Applied Statistics	3 or 4
UP 438	Disasters and Urban Planning	4
Sustainable and Resilient Infrastructure Systems		
Science Electives Required - None		
Science Electives Recommended:		
ATMS 120	Severe and Hazardous Weather	3
CS 357	Numerical Methods I	3
ENSU 300	Environmental Sustainability	3
ESE 140	Climate and Global Change	3
ESE 320	Water Planet, Water Crisis	3
ESE 482	Challenges of Sustainability	3
FIN 221	Corporate Finance	3
GEOG 103	Earth's Physical Systems	4
NPRE 201	Energy Systems	2 or 3
NRES 439	Env and Sustainable Dev	3
SE 320	Control Systems	4
STAT 420	Methods of Applied Statistics	3 or 4
UP 406	Urban Ecology	4
Civil Engineering Core Courses Required:		
CEE 340	Energy and Global Environment	3
Civil Engineering Core Courses Recommended:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses Required:		
CEE 491	Decision and Risk Analysis (And select 3 courses from the recommended list below)	3 or 4
Advanced Technical Courses Recommended:		
ABE 436	Renewable Energy Systems	3 or 4
CEE 401	Concrete Materials	4
CEE 406	Pavement Design I	3 or 4
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 418	Public Transportation Systems	3 or 4
CEE 421	Construction Planning	3 or 4
CEE 424	Sustainable Const Methods	4
CEE 434	Environmental Systems I	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 458	Water Resources Field Methods	4
CEE 465	Design of Structural Systems	3
CEE 493	Sustainable Design Eng Tech	4
CEE 498	Special Topics (Section PS)	1 to 4
MSE 489	Matl Select for Sustainability	3 or 4
UP 466	Energy & the Built Environment	4
UP 480	Sustainable Design Principles	2
General Civil Engineering		
Science Electives Required - Choose one course from recommended list below:		
Science Electives Recommended:		
GEOL 107	Physical Geology	4
CHEM 222	Quantitative Analysis Lecture	2
CHEM 232	Elementary Organic Chemistry I	3 or 4
ME 200	Thermodynamics	3
STAT 400	Statistics and Probability I	4
Civil Engineering Core Courses Required - Should take 7 courses from list below:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 340	Energy and Global Environment	3
CEE 350	Water Resources Engineering	3
CEE 360	Structural Engineering	3
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses Required - Option I: Pick no more than one course from each area below such that the sum of the core and advanced courses is at least 34 credit hours. Option II: Pick 2 courses from one area and no more than one course from each of the remaining areas to total 34 credit hours.		
Construction:		
CEE 420	Construction Productivity	3 or 4
CEE 421	Construction Planning	3 or 4
CEE 422	Construction Cost Analysis	3 or 4
Environmental:		

CEE 437	Water Quality Engineering	3
CEE 440	Fate Cleanup Environ Pollutant	4
CEE 446	Air Quality Engineering	4
Geotechnical:		
CEE 480	Foundation Engineering	3
CEE 483	Soil Mechanics and Behavior	4
Materials:		
CEE 401	Concrete Materials	4
Structures:		
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
Transportation:		
CEE 405	Asphalt Materials I	3 or 4
CEE 406	Pavement Design I	3 or 4
CEE 407	Airport Design	3 or 4
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 411	RR Project Design & Constr	3 or 4
CEE 412	High-Speed Rail Engineering	3 or 4
CEE 415	Geometric Design of Roads	4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 418	Public Transportation Systems	3 or 4
Water Resources:		
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
Secondary Field Advanced Technical Electives. Select courses from approved lists to complement the primary area and add breadth to the program of study. See list below:		6
Construction Engineering and Management		
Civil Engineering Core Courses Required:		
CEE 320	Construction Engineering	3
Advanced Technical Courses Required:		
CEE 421	Construction Planning	3 or 4
CEE 420	Construction Productivity	3-4
or CEE 422	Construction Cost Analysis	
Advanced Technical Courses Recommended:		
CEE 424	Sustainable Const Methods	4
Construction Materials Engineering		
Civil Engineering Core Courses Required:		
CEE 300	Behavior of Materials	4
Advanced Technical Courses Required - Pick 2 courses from the recommended list below:		
Advanced Technical Courses Recommended:		
CEE 401	Concrete Materials	4
CEE 405	Asphalt Materials I	3 or 4
CEE 406	Pavement Design I	3 or 4
Environmental Engineering		
Civil Engineering Core Courses Required:		
CEE 330	Environmental Engineering	3
Advanced Technical Courses Required - Choose 2 courses from the recommended list below:		
CEE 430	Ecological Quality Engineering	2
CEE 434	Environmental Systems I	3
CEE 437	Water Quality Engineering	3
CEE 438	Science & Environmental Policy	3
CEE 445	Air Quality Modeling	4
CEE 442	Environmental Engineering Principles, Physical	4
CEE 443	Env Eng Principles, Chemical	4
CEE 444	Env Eng Principles, Biological	4
CEE 446	Air Quality Engineering	4
CEE 447	Atmospheric Chemistry	4
CEE 449	Environmental Engineering Lab	3
Geotechnical Engineering		
Civil Engineering Core Courses Required:		
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses Required:		
CEE 480	Foundation Engineering	3-4
or CEE 484	Applied Soil Mechanics	
CEE 483	Soil Mechanics and Behavior	4
Advanced Technical Courses Recommended - NONE		
Structural Engineering		
Civil Engineering Core Courses Required:		
CEE 360	Structural Engineering	3
Advanced Technical Courses Required:		
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
Transportation Engineering		
Civil Engineering Core Courses Required:		
CEE 310	Transportation Engineering	3
Advanced Technical Courses Required: Select 2 courses, each from a different Area		
Area 1 - Facilities:		
CEE 405	Asphalt Materials I	3 or 4
CEE 406	Pavement Design I	3 or 4
CEE 407	Airport Design	3 or 4
Area 2 - Systems:		
CEE 407	Airport Design	3 or 4
CEE 415	Geometric Design of Roads	4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 418	Public Transportation Systems	3 or 4
Area 3 - Railroad:		
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 410	Railway Signaling & Control	3 or 4
CEE 411	RR Project Design & Constr	3 or 4
Water Resources Engineering and Science		
Civil Engineering Core Courses Required:		
CEE 350	Water Resources Engineering	3
Advanced Technical Courses Required: 2 courses from the recommended list below:		
Advanced Technical Courses Recommended:		
CEE 432	Stream Ecology	3 or 4
CEE 433	Water Technology and Policy	3 or 4

CEE 450	Surface Hydrology	3
CEE 451	Environmental Fluid Mechanics	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 458	Water Resources Field Methods	4
CEE 498	Special Topics (Section EH)	1 to 4
Energy-Water-Environment Sustainability		
Civil Engineering Core Courses Required:		
CEE 340	Energy and Global Environment	3
Advanced Technical Courses Required:		
CEE 493	Sustainable Design Eng Tech (and select one course from the recommended list below:)	4
Advanced Technical Courses Recommended:		
ABE 436	Renewable Energy Systems	3 or 4
ARCH 441	Heat and Moisture in Buildings	3
CEE 424	Sustainable Const Methods	4
CEE 433	Water Technology and Policy	3 or 4
CEE 434	Environmental Systems I	3
CEE 437	Water Quality Engineering	3
CEE 446	Air Quality Engineering	4
CEE 449	Environmental Engineering Lab	3
CEE 450	Surface Hydrology	3
CEE 452	Hydraulic Analysis and Design	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 457	Groundwater	3
CEE 498	Special Topics (Section EH)	1 to 4
ENG 471	Seminar Energy & Sustain Engrg	1
ME 400	Energy Conversion Systems	3 or 4
NPRE 402	Nuclear Power Engineering	3 or 4
NPRE 475	Wind Power Systems	3 or 4
Societal Risk and Hazard Mitigation		
Civil Engineering Core Courses Required - None		
Advanced Technical Courses Required:		
CEE 491	Decision and Risk Analysis (and select one from the recommended list below:)	3 or 4
Advanced Technical Courses Recommended:		
CEE 406	Pavement Design I	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 437	Water Quality Engineering	3
CEE 440	Fate Cleanup Environ Pollutant	4
CEE 449	Environmental Engineering Lab	3
CEE 460	Steel Structures I	3
CEE 461	Reinforced Concrete I	3
CEE 465	Design of Structural Systems	3
CEE 472	Structural Dynamics I	3 or 4
CEE 498	Special Topics (Section EW)	1 to 4
IE 410	Advanced Topics in Stochastic Processes & Applications	3 or 4
NPRE 442	Radioactive Waste Management	3
SE 450	Decision Analysis I	3 or 4
STAT 425	Applied Regression and Design	3 or 4
STAT 429	Time Series Analysis	3 or 4
STAT 430	Topics in Applied Statistics	3 or 4
UP 438	Disasters and Urban Planning	4
Sustainable and Resilient Infrastructure Systems		
Civil Engineering Core Courses Required:		
CEE 340	Energy and Global Environment	3
Civil Engineering Core Courses Recommended:		
CEE 300	Behavior of Materials	4
CEE 310	Transportation Engineering	3
CEE 320	Construction Engineering	3
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
CEE 380	Geotechnical Engineering	3
Advanced Technical Courses Required:		
CEE 491	Decision and Risk Analysis (And select one course from the recommended list below:)	3 or 4
Advanced Technical Courses Recommended:		
ABE 436	Renewable Energy Systems	3 or 4
CEE 401	Concrete Materials	4
CEE 406	Pavement Design I	3 or 4
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 409	Railroad Track Engineering	3 or 4
CEE 416	Traffic Capacity Analysis	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 418	Public Transportation Systems	3 or 4
CEE 421	Construction Planning	3 or 4
CEE 424	Sustainable Const Methods	4
CEE 434	Environmental Systems I	3
CEE 453	Urban Hydrology and Hydraulics	4
CEE 458	Water Resources Field Methods	4
CEE 465	Design of Structural Systems	3
CEE 493	Sustainable Design Eng Tech	4
CEE 498	Special Topics (Section PS)	1 to 4
MSE 489	Matl Select for Sustainability	3 or 4
UP 466	Energy & the Built Environment	4
UP 480	Sustainable Design Principles	2
Global Context		
Science Electives Recommended:		
CPSC 116	The Global Food Production Web	3
ESE 140	Climate and Global Change	3
ESE 320	Water Planet, Water Crisis	3
ESE 482	Challenges of Sustainability	3
Civil Engineering Core Courses Recommended:		
CEE 330	Environmental Engineering	3
or CEE 350	Water Resources Engineering	
CEE 340	Energy and Global Environment	3
Advanced Technical Courses Recommended: Must take at least 3 credit hours in each of the 2 areas below:		
Knowledge and Skills Needed to Effectively Address Global Issues:		
ACE 451	Agriculture in Intl Dev	3 to 4
ATMS 421	Earth Systems Modeling	4
CEE 438	Science & Environmental Policy	3

CEE 445	Air Quality Modeling	4
CEE 447	Atmospheric Chemistry	4
CEE 450	Surface Hydrology	3
ECON 420	International Economics	2 to 4
Global CEE Design:		
CEE 408	Railroad Transportation Engrg	3 or 4
CEE 417	Urban Transportation Planning	4
CEE 437	Water Quality Engineering	3
CEE 449	Environmental Engineering Lab	3
CEE 465	Design of Structural Systems	3
CEE Multidisciplinary		
Science Electives Recommended: Any recommended science electives from existing CEE Primary and Secondary listed above		
Civil Engineering Core Courses Recommended: Core courses relevant to the student's interests		
Advanced Technical Courses: Students work with CEE Academic Advisors		
Atmosphere Science (Primary Field: Environmental Engineering)		
Civil Engineering Core Courses Required:		
CEE 330	Environmental Engineering	3
Advanced Technical Courses Recommended:		
ATMS 302	Atmospheric Dynamics I	3
ATMS 410	Radar Remote Sensing	4
ATMS 411	Satellite Remote Sensing	4
ATMS 421	Earth Systems Modeling	4
CEE 445	Air Quality Modeling	4
CEE 447	Atmospheric Chemistry	4
Chemistry (Primary Field: Environmental Engineering)		
Civil Engineering Core Courses Required:		
CEE 330	Environmental Engineering	3
Advanced Technical Courses Recommended:		
CHEM 232	Elementary Organic Chemistry I	3 or 4
CHEM 315	Instrumental Chem Systems Lab	2
CHEM 332	Elementary Organic Chem II	4
CHEM 420	Instrumental Characterization	2
CHEM 440	Physical Chemistry Principles	4
Chemical Engineering (Primary Field: Environmental Engineering)		
Civil Engineering Core Courses Required:		
CEE 330	Environmental Engineering	3
CEE 350	Water Resources Engineering	3
Advanced Technical Courses Recommended:		
CHBE 321	Thermodynamics	4
CHBE 421	Momentum and Heat Transfer	4
CHBE 422	Mass Transfer Operations	4
CHBE 424	Chemical Reaction Engineering	3
Microbiology (Primary Field: Environmental Engineering)		
Civil Engineering Core Courses Required:		
CEE 330	Environmental Engineering	3
Advanced Technical Courses Recommended:		
MCB 301	Experimental Microbiology	3
MCB 431	Microbial Physiology	3
MCB 450	Introductory Biochemistry	3
CEE 444	Env Eng Principles, Biological	4
Toxicology (Primary Field: Environmental Engineering)		
Civil Engineering Core Courses Required:		
CEE 330	Environmental Engineering	3
Advanced Technical Courses Recommended:		
CHEM 332	Elementary Organic Chem II	4
ENVS 431	Environ Toxicology & Health	3
ENVS 480	Basic Toxicology	3
MCB 450	Introductory Biochemistry	3

Electives

Code	Title	Hours
The Grainger College of Engineering Liberal Education course list, or additional courses from the campus General Education lists for Social and Behavioral Sciences or Humanities and the Arts [3]		6
Free electives. Additional unrestricted course work, subject to certain exceptions as noted by the College, so that there are at least 128 credit hours earned toward the degree. [4]		6
Total Hours of Curriculum to Graduate		128

1 *External transfer students take ENG 300 instead.*

2 MATH 220 *may be substituted, with four of the five credit hours applying toward the degree.* MATH 220 *is appropriate for students with no background in calculus.*

3 *The Grainger College of Engineering approved liberal education course list can be found here* (https://wiki.illinois.edu/wiki/display/ugadvise/Degree+Requirements/#DegreeRequirements-GeneralEducationElectives)*. Note that these credit hours could carry the required cultural studies designation required for campus general education requirements.*

4 *The Grainger College of Engineering restrictions to free electives can be found here* (https://wiki.illinois.edu/wiki/display/ugadvise/Degree+Requirements/#DegreeRequirements-FreeElectives).

Suggested Sequence

The curriculum sequence below is a suggested sequence, as all Grainger Engineering students work with a department academic advisor to achieve their educational goals, specific to their needs and preparation. Dynamic and Static curricular maps, which include prerequisite sequencing, can be found here (https://grainger.illinois.edu/academics/undergraduate/majors-and-minors/cee-map).

First Year

First Semester		Hours
CEE 195[1]	About Civil Engineering	1
ENG 100	Engineering Orientation	0
MATH 221[2]	Calculus I	4
CHEM 102	General Chemistry I	3
CHEM 103	General Chemistry Lab I	1
RHET 105 or SE 101[3]	Writing and Research	4-3

General education elective[4]		3
	Semester Hours	16-15
Second Semester		
MATH 231	Calculus II	3
CHEM 104	General Chemistry II	3
CHEM 105	General Chemistry Lab II	1
PHYS 211	University Physics: Mechanics	4
CS 101	Intro Computing: Engrg Sci	3
SE 101 or RHET 105[3]	Engineering Graphics Design	3-4
	Semester Hours	17-18
Second Year		
First Semester		
CEE 201	Systems Engrg Economics	3
MATH 241	Calculus III	4
PHYS 212	University Physics: Elec Mag	4
TAM 211	Statics	3
MATH 225	Introductory Matrix Theory	2
	Semester Hours	16
Second Semester		
CEE 202	Engineering Risk Uncertainty	3
PHYS 213	Univ Physics: Thermal Physics	2
TAM 212	Introductory Dynamics	3
TAM 251	Introductory Solid Mechanics	3
General education elective[4]		3
Free elective		3
	Semester Hours	17
Third Year		
First Semester		
MATH 285	Intro Differential Equations	3
TAM 335	Introductory Fluid Mechanics	4
Civil engineering technical courses[5]		6
Science elective[6]		3
	Semester Hours	16
Second Semester		
BTW 261	Principles Tech Comm	3
Civil engineering technical courses[5]		10
General education elective[4]		3
	Semester Hours	16
Fourth Year		
First Semester		
CEE 495	Professional Practice	0
Civil engineering technical courses[5]		9
General education electives[4]		6
	Semester Hours	15
Second Semester		
Civil engineering technical courses[5]		9
General education elective[4]		3
Free elective		3
	Semester Hours	15
	Total Hours:	128

1 *Offered in the fall semester, student should take in the first or second semester of enrollment in Civil Engineering.*

2 *MATH 220 may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.*

3 *RHET 105 (or an alternative Composition I sequence) is taken either in the first or second semester of the first year, according to the student's UIN (Spring if your UIN is Odd). SE 101 is taken the other semester. Composition I guidelines can be found at http://catalog.illinois.edu/general-information/degree-general-education-requirements/ under Written Communication Requirement.*

4 *Students must take 6 hours from the campus General Education Social and Behavioral Sciences list, 6 hours from campus General Education Humanities and the Arts list, and 6 hours from a liberal education list approved by the college or from the campus General Education lists for Social and Behavioral Sciences or Humanities and the Arts. ECON 102 or ECON 103 must be one of the Social and Behavioral Sciences courses. Students must also complete the campus cultural studies requirement by completing (i) one western/comparative culture(s) course, (ii) one non-western culture(s) course, and (iii) one U.S. Minority Culture(s) course from the General Education cultural studies lists. Most students select general education courses that simultaneously satisfy these cultural studies requirements.*

5 *Civil engineering technical courses are defined as core courses and advanced technical electives and must total 34 hours of credit. Five courses and a minimum of fifteen hours must be core courses as outlined in the Civil Engineering Undergraduate Handbook.* (http://cee.illinois.edu/handbooks) *Advanced technical electives are selected to correspond with chosen primary and secondary areas of emphasis in civil engineering as outlined in the Civil Engineering Undergraduate Handbook.* (http://cee.illinois.edu/handbooks) *A minimum of twelve and six hours must be taken for the primary and secondary areas, respectively.*

6 *The science elective is selected in accord with recommendations for the chosen primary area of emphasis in civil engineering as outlined in the Civil Engineering Undergraduate Handbook* (http://cee.illinois.edu/handbooks).