

BACHELOR OF ENGINEERING IN CIVIL ENGINEERING 4+1 GRADUATE TRACK

Introduction

Civil engineers are responsible for planning, designing, and supervising construction of infrastructure including buildings, bridges, highways, levees, dams, drinking water and wastewater treatment facilities, ports, railroads, airports, etc. The undergraduate program in Civil Engineering (CE) at YSU offers a Bachelor of Engineering (B.E.) in Civil Engineering degree through an ABET accredited curriculum designed for students to graduate in four years. Students receive a fundamental background in math and science to prepare for core courses in civil engineering. They not only learn from faculty lectures, but also gain real-world experience through participating in co-ops/internships, undergraduate research, laboratory activities, and building concrete canoe and steel bridge from scratch and competing in regional and national competitions.

Civil engineers make the world a better place. With that philosophy in mind, we educate our students to undertake challenging civil engineering jobs and leadership roles in building our community and infrastructure. At the time of graduation, our students are well-prepared to enter the workforce in all five sub-disciplines of civil engineering including structural, transportation, geotechnical, water resources, and environmental. Faculty members have the highest degree in their respective sub-disciplines and the professional engineering licensure that requires them to remain active in the profession through continuing education and research.

In order to support ASCE's 'Bachelor+30' initiative to facilitate lifelong learning and to improve the knowledge base of future civil engineers, an accelerated 4+1 BE/MSE in Civil Engineering track is being offered. Students already in the YSU Civil Engineering undergraduate program can apply for admission into this accelerated track after completing 78 semester hours with a GPA of 3.3 or higher. After being admitted into the accelerated track, students will be allowed a maximum of nine semester hours of graduate coursework to be double-counted towards both Bachelor's and Master's degrees upon approval by the Graduate Program Director. An additional 6000 level graduate coursework of three semester hours can be completed as an undergraduate student and used exclusively for graduate credit. This will allow students to obtain a graduate degree with 30 semester hours within a year after the Bachelor's degree.

For more information about the 4+1 BE/MSE in Civil Engineering track, please contact:

Anwarul Islam, PhD, PE, F.ASCE
Professor and Program Coordinator
Civil Engineering
2415 Moser Hall
One University Plaza
Youngstown, OH 44555
Tel: (330) 941-2421
Fax: (330) 941-3265
Email: aaislam@ysu.edu

Bachelor of Engineering program

COURSE	TITLE	S.H.
First Year Requirement - Student Success		
YSU 1500	Success Seminar	1-2
or YSU 1500S	Youngstown State University Success Seminar	
or HONR 1500	Intro to Honors	
General Education Requirements		
ENGL 1550	Writing 1	3-4

or ENGL 1549	Writing 1 with Support	
ENGL 1551	Writing 2	3
Mathematics requirement (met with MATH in major)		
Arts and Humanities Elective 1: Select 1 course.		3
PHIL 2625	Introduction to Professional Ethics	
PHIL 2628	Business Ethics	
Arts and Humanities Elective 2: Select 1 course.		3
Natural Science (met with CHEM and PHYS required for major)		
Social Sciences Electives (6 S.H., Select 2 courses)		6
General Education Electives (9 S.H., Select 2 additional courses)		6
CMST 1545	Communication Foundations	3
Civil Engineering Courses		
CEEN 2601	Statics	3
CEEN 2602	Strength of Materials	3
CEEN 2602L	Strength of Materials Lab	1
CEEN 2610	Surveying	3
CEEN 2610L	Surveying Laboratory	1
CEEN 2660	Computer Aided Design and Drafting	2
CEEN 3716	Fluid Mechanics	3
CEEN 3716L	Fluid Mechanics Lab	1
CEEN 3717	Hydraulic Design	4
CEEN 3720	Transportation Engineering	3
CEEN 3736	Fundamentals of Environmental Engineering	3
CEEN 3749	Structural Analysis 1	3
CEEN 3749L	Structural Analysis 1 Lab	1
CEEN 4812	Construction Management	3
CEEN 4863	Integrated Design Project	3
CEEN 4863L	Integrated Design Project Lab	1
CEEN 4881	Geotechnical Engineering	3
CEEN 4881L	Geotechnical Lab	1
CEEN 5855	Reinforced Concrete Design	3
CEEN 5856	Steel Design	3
Dual Credit CEEN Design Elective 1: Select one course		3
CEEN 5820	Pavement Material and Design	
CEEN 5837	Environmental Engineering Design	
CEEN 5869	Design of Air Pollution Control Systems	
CEEN 5882	Foundation Engineering	
CEEN 5883	Bridge Engineering	
Dual Credit CEEN Electives: Select two courses		6
CEEN 5820	Pavement Material and Design	
CEEN 5829	Civil Engineering Materials - Concrete	
CEEN 5832	Natural Systems Engineering	
CEEN 5836	Environmental Water Chemistry	
CEEN 5837	Environmental Engineering Design	
CEEN 5849	Structural Analysis 2	
CEEN 5869	Design of Air Pollution Control Systems	
CEEN 5880	Advanced Hydraulics	
CEEN 5882	Foundation Engineering	
CEEN 5883	Bridge Engineering	
CEEN 5884	Solid and Hazardous Waste Management	
General Engineering Courses		
ENGR 1500	Engineering Orientation	1
ENGR 1550	Engineering Concepts	2
ENGR 1560	Engineering Computing	2
Engineering Fundamentals Courses		
MECH 2641	Dynamics	3
ISEN 2624	Engineering Economy	3

Mathematics/Statistics Courses

MATH 1571	Calculus 1	4
MATH 1572	Calculus 2	4
MATH 2673	Calculus 3	4
MATH 3705	Differential Equations	3
ISEN 2610 or STAT 3743	Engineering Statistics Probability and Statistics	3-4

Basic Science Courses

CHEM 1515	General Chemistry 1	3
CHEM 1515L	General Chemistry 1 Laboratory	1
PHYS 2610	General Physics 1	4
GEOL 2611 or BIOL 2601	Geology for Engineers General Biology 1: Molecules and Cells	3
CHEM 1516 & 1516L or PHYS 2611	General Chemistry 2 and General Chemistry 2 Laboratory General Physics 2	4

Total Semester Hours 129-132

4+1 BE/MSE in Civil Engineering

Students already in the YSU Civil Engineering undergraduate program can apply for admission into the 4+1 BE/MSE in Civil Engineering track after completing 78 semester hours with a GPA of 3.3 or higher. After being admitted into this accelerated track, students will be allowed a maximum of nine semester hours of graduate coursework to be double-counted towards both Bachelor's and Master's degrees upon approval by the Graduate Program Director. An additional 6000 level graduate coursework of three semester hours can be completed as an undergraduate student and used exclusively for graduate credit. This will allow students to obtain a graduate degree with 30 semester hours within a year after their Bachelor's degree.

FOUR-YEAR PLAN

Year 1

Fall		S.H.
YSU 1500 or YSU 1500S or HONR 1500	Success Seminar or Youngstown State University Success Seminar or Intro to Honors	1-2
ENGL 1550 or ENGL 1549	Writing 1 or Writing 1 with Support	3-4
CHEM 1515	General Chemistry 1	3
CHEM 1515L	General Chemistry 1 Laboratory	1
ENGR 1500	Engineering Orientation	1
ENGR 1550	Engineering Concepts	2
MATH 1571	Calculus 1	4
Arts and Humanities Elective 1		3
PHIL 2625 or PHIL 2628	Introduction to Professional Ethics or Business Ethics	
Semester Hours		18-20

Spring

ENGL 1551	Writing 2	3
ENGR 1560	Engineering Computing	2
MATH 1572	Calculus 2	4
CMST 1545	Communication Foundations	3
Arts and Humanities Elective 2		3
Semester Hours		15

Year 2

Fall		
MATH 2673	Calculus 3	4
CEEN 2610	Surveying	3
CEEN 2610L	Surveying Laboratory	1
CEEN 2601	Statics	3
PHYS 2610	General Physics 1	4
Semester Hours		15
Spring		
MATH 3705	Differential Equations	3
CEEN 2602	Strength of Materials	3
CEEN 2602L	Strength of Materials Lab	1
GEOL 2611 or BIOL 2601	Geology for Engineers or General Biology 1: Molecules and Cells	3
CEEN 2660	Computer Aided Design and Drafting	2
PHYS 2611 or CHEM 1516 and CHEM 1516L	General Physics 2 or General Chemistry 2 and General Chemistry 2 Laboratory	4
Semester Hours		16

Year 3

Fall		
CEEN 3716	Fluid Mechanics	3
CEEN 3716L	Fluid Mechanics Lab	1
CEEN 3720	Transportation Engineering	3
CEEN 3736	Fundamentals of Environmental Engineering	3
CEEN 3749	Structural Analysis 1	3
CEEN 3749L	Structural Analysis 1 Lab	1
ISEN 2610 or STAT 3743	Engineering Statistics or Probability and Statistics	3-4
Semester Hours		17-18

Spring

CEEN 3717	Hydraulic Design	4
CEEN 4881	Geotechnical Engineering	3

CEEN 4881L	Geotechnical Lab	1
CEEN Elective 1		3
General Education Elective 1		3
General Education Elective 2		3
Semester Hours		17
Year 4		
Fall		
CEEN 4812	Construction Management	3
CEEN 5855	Reinforced Concrete Design	3
CEEN 5856	Steel Design	3
CEEN Elective 2: CEEN Design Elective		3
ISEN 2624	Engineering Economy	3
Semester Hours		15
Spring		
CEEN 4863	Integrated Design Project	3
CEEN 4863L	Integrated Design Project Lab	1
MECH 2641	Dynamics	3
CEEN Elective 3. May substitute with approval of CE Program Coordinator.		3
Social Science Elective 1		3
Social Science Elective 2		3
Semester Hours		16
Total Semester Hours		129-132

7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Program Educational Objectives

The Civil Engineering program will provide graduates with the foundation of knowledge and skills necessary for productive and rewarding careers. The program prepares graduate to achieve the following educational objectives within a few years after graduation:

1. Perform essential functions on multidisciplinary teams in their professional careers in civil engineering.
2. Demonstrate necessary communication, management, leadership, and interdisciplinary technical skills to excel in engineering and non-engineering sectors.
3. Continue their intellectual, social, and professional growth through lifelong learning and advanced degrees.
4. Obtain professional engineering licensure.

Student Outcomes

The YSU undergraduate program in Civil Engineering adopted the following student outcomes that prepare its graduates to attain the program educational objectives listed above. At the time of graduation, the program graduates should have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply 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 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