

# CIVIL ENGINEERING UNDERGRADUATE MAJOR (BS, HBS)

This program is available at the following locations:

- Corvallis
- Ecampus

The Bachelor of Science and Honors Bachelor of Science degrees in Civil Engineering are accredited by the Engineering Accreditation Commission of ABET, <http://www.ABET.org>.

Civil engineering is a diverse professional field with discipline specialties in structures, transportation, water supply and water pollution control, geotechnical engineering, hydrology, hydraulics and water resources, geomatics, ocean engineering, construction, and engineering planning and economics. All civil engineering students receive basic instruction in the various disciplines, with the option for additional elective courses in desired areas. The program is supported by highly qualified faculty and staff that maintain the programs and facilities at the highest level of quality.

The civil engineering curriculum within the School of Civil and Construction Engineering (CCE) includes the basic sciences, social sciences, humanities, communication skills, engineering sciences, and engineering design to teach students an integrated approach to finding practical solutions.

The mission of the civil engineering program is to provide a comprehensive, state-of-the-art education to prepare students for professional and responsible engineering positions with business, industry, consulting firms or government.

## Program Educational Objectives—Civil Engineering

The Bachelor of Science and Honors Bachelor of Science degrees in Civil Engineering are accredited by the Engineering Accreditation Commission of ABET, <http://www.ABET.org>, which requires stated program educational objectives and student outcomes to support these.

OSU Civil Engineering graduates receive a compelling education, and within 3 to 5 years of graduation will have:

1. Assembled, analyzed and synthesized/evaluated information to solve engineering problems and perform modern civil engineering design by applying mathematics, engineering sciences and fundamentals of civil engineering.
2. Participated in modern professional practice or a graduate program in a specialty area of civil engineering, demonstrating effective communication, collaborative work and leadership in diverse teams, ethical decision-making, successful management of personal and professional career objectives, and continual development through lifelong learning and professional involvement.
3. Recognized the importance of professional licensure and have achieved or prepared to achieve this significant accomplishment. In this endeavor, consideration of the public health, welfare and safety is seen as the paramount priority.

4. Applied an understanding of public policy and contemporary societal issues with sensitivity to the challenge of meeting social, environmental, and economic constraints within a global community.

Design is the essence of civil engineering. Junior and senior level courses include extensive design content, culminating in a team approach to the solution of open-ended, realistic problems, including capstone design and professional practice courses. Courses with design content include those with "design" in their titles. A more detailed explanation of the design experience and design course sequences is contained in the Civil Engineering Advising Guide (<https://engineering.oregonstate.edu/academics/programs/civil-engineering#toc-undergraduate-information>).

## Major Code: 306

Upon successful completion of the program, students will meet the following learning outcomes:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 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.
- Communicate effectively with a range of audiences.
- 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.
- Function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives.
- Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Acquire and apply new knowledge as needed, using appropriate learning strategies.

First Year		Credits
ENGR 110 & ENGR 115 or ENGR 310	+TRANSITIONS <sup>1</sup> or +TRANSITIONS	3
ENGR 102	+DESIGN ENGINEERING AND PROBLEM SOLVING	3
ENGR 103	ENGINEERING COMPUTATION AND ALGORITHMIC THINKING	3
CH 201 & CH 204	GENERAL CHEMISTRY FOR ENGINEERING APPLICATIONS and +CHEMISTRY FOR ENGINEERING APPLICATIONS LABORATORY I	4
CH 202	CHEMISTRY FOR ENGINEERING MAJORS	3
COMM 111Z or COMM 114 or COMM 218Z	+*PUBLIC SPEAKING or +*ARGUMENT AND CRITICAL DISCOURSE or +*INTERPERSONAL COMMUNICATION	3-4
ECON 201Z or ECON 202Z	+*PRINCIPLES OF MICROECONOMICS or +*PRINCIPLES OF MACROECONOMICS	4
MTH 251Z	+*DIFFERENTIAL CALCULUS	4
MTH 252Z	INTEGRAL CALCULUS	4
MTH 254	VECTOR CALCULUS I	4
WR 121Z	+*COMPOSITION I	4
Select an additional Core Ed Scientific Inquiry and Analysis course <sup>2</sup>		4
<b>Credits</b>		<b>43</b>
<b>Second Year</b>		
CCE 201	CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN	3
CCE 207	+BUILDING YOUR CAREER IN CCE	1

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CE 202	CIVIL ENGINEERING: GEOSPATIAL INFORMATION AND GIS	3
ENGR 211	STATICS	3
ENGR 212	DYNAMICS	3
ENGR 213	STRENGTH OF MATERIALS	3
MTH 256	APPLIED DIFFERENTIAL EQUATIONS	4
MTH 264 & MTH 265	INTRODUCTION TO MATRIX ALGEBRA and INTRODUCTION TO SERIES	4
PH 211 & PH 212 & PH 213	+*GENERAL PHYSICS WITH CALCULUS and *GENERAL PHYSICS WITH CALCULUS and *GENERAL PHYSICS WITH CALCULUS	12
ST 314	INTRODUCTION TO STATISTICS FOR ENGINEERS	3
WR 227Z	+*TECHNICAL WRITING	4
<b>Credits</b>		<b>43</b>
<b>Third Year</b>		
CCE 321	CIVIL AND CONSTRUCTION ENGINEERING MATERIALS	4
CE 311	FLUID MECHANICS	4
CE 313	HYDRAULIC ENGINEERING	4
CE 362	REALITY CAPTURE FOR ENGINEERING APPLICATIONS	3
CE 372	GEOTECHNICAL ENGINEERING I	4
CE 373	GEOTECHNICAL ENGINEERING II	4
CE 381	STRUCTURAL THEORY I	4
CE 382	STRUCTURAL THEORY II	4
CE 383 or CE 481	DESIGN OF STEEL STRUCTURES or REINFORCED CONCRETE I	4
CE 392	INTRODUCTION TO HIGHWAY ENGINEERING	4
CE 412	HYDROLOGY	4
CEM 263	PLANE SURVEYING	3
<b>Credits</b>		<b>46</b>
<b>Fourth Year</b>		
CE 418	*CIVIL ENGINEERING PROFESSIONAL PRACTICE	3
CE 419	*CIVIL INFRASTRUCTURE DESIGN	3
CE 420	ENGINEERING PLANNING	4
CE 491	TRANSPORTATION ENGINEERING	3
ENGR 330	+INCLUSIVE AND EQUITABLE ENGINEERING	3
ENVE 321	ENVIRONMENTAL ENGINEERING FUNDAMENTALS	4
Technical Electives		11
Remaining Core Ed and Electives		16-17
<b>Credits</b>		<b>48</b>
<b>Total Credits</b>		<b>180</b>

\* Baccalaureate Core course. Applies to general education requirements for undergraduate students in a catalog year up to 2024-2025

+ Core Education course. Applies to general education requirements for undergraduate students in catalog year 2025-2026 and beyond

^ Writing Intensive Curriculum (WIC) course

<sup>1</sup> Students who complete CORE 100 or CORE 300 or a non-ENGR Transitions course will use an Engineering elective course to substitute for ENGR 115

<sup>2</sup> Any Core Ed Scientific Inquiry and Analysis course can be used except CH 121, CH 201 & CH 204, CH 221Z & CH 227Z, PH 211 and PH 201

**Major Code: 306**

*Degree plans are subject to change and the following is only an example of how students may complete their degree in four years. Students should consult their advisor to determine the best degree plan for them. Contact details for advisors can be found on the Academic Advising (<https://catalog.oregonstate.edu/advising/>) page.*

<b>First Year</b>		
<b>Fall</b>		
CH 201 & CH 204	GENERAL CHEMISTRY FOR ENGINEERING APPLICATIONS and +CHEMISTRY FOR ENGINEERING APPLICATIONS LABORATORY I	4
ENGR 110 & ENGR 115 or ENGR 310	+TRANSITIONS or +TRANSITIONS	3
MTH 251Z	+*DIFFERENTIAL CALCULUS	4
WR 121Z	+*COMPOSITION I	4
<b>Credits</b>		<b>15</b>
<b>Winter</b>		
CH 202	CHEMISTRY FOR ENGINEERING MAJORS	3
COMM 114 or COMM 111Z or COMM 218Z	+*ARGUMENT AND CRITICAL DISCOURSE or +*PUBLIC SPEAKING or +*INTERPERSONAL COMMUNICATION	3-4
ENGR 102	+DESIGN ENGINEERING AND PROBLEM SOLVING	3
MTH 252Z	INTEGRAL CALCULUS	4
Core Ed: Difference, Power & Oppression Foundations		3-4
<b>Credits</b>		<b>16</b>
<b>Spring</b>		
ECON 201Z or ECON 202Z	+*PRINCIPLES OF MICROECONOMICS or +*PRINCIPLES OF MACROECONOMICS	4
ENGR 103	ENGINEERING COMPUTATION AND ALGORITHMIC THINKING	3
MTH 254	VECTOR CALCULUS I	4
Additional Core Ed Scientific Inquiry & Analysis I course		4
<b>Credits</b>		<b>15</b>
<b>Second Year</b>		
<b>Fall</b>		
CCE 201	CIVIL AND CONSTRUCTION ENGINEERING GRAPHICS AND DESIGN	3
CCE 207	+BUILDING YOUR CAREER IN CCE	1
ENGR 211	STATICS	3
MTH 264 & MTH 265	INTRODUCTION TO MATRIX ALGEBRA and INTRODUCTION TO SERIES	4
PH 211	+*GENERAL PHYSICS WITH CALCULUS	4
<b>Credits</b>		<b>15</b>
<b>Winter</b>		
CE 202	CIVIL ENGINEERING: GEOSPATIAL INFORMATION AND GIS	3
ENGR 213	STRENGTH OF MATERIALS	3
MTH 256	APPLIED DIFFERENTIAL EQUATIONS	4
PH 212	*GENERAL PHYSICS WITH CALCULUS	4
<b>Credits</b>		<b>14</b>
<b>Spring</b>		
ENGR 212	DYNAMICS	3
PH 213	*GENERAL PHYSICS WITH CALCULUS	4
ST 314	INTRODUCTION TO STATISTICS FOR ENGINEERS	3
WR 227Z	+*TECHNICAL WRITING	4
<b>Credits</b>		<b>14</b>
<b>Third Year</b>		
<b>Fall</b>		
CE 311	FLUID MECHANICS	4
CE 381	STRUCTURAL THEORY I	4
CEM 263	PLANE SURVEYING	3
CCE 321	CIVIL AND CONSTRUCTION ENGINEERING MATERIALS	4
<b>Credits</b>		<b>15</b>
<b>Winter</b>		
CE 313	HYDRAULIC ENGINEERING	4
CE 382	STRUCTURAL THEORY II	4
CE 372	GEOTECHNICAL ENGINEERING I	4

CE 392	INTRODUCTION TO HIGHWAY ENGINEERING	4
<b>Credits</b>		<b>16</b>
<b>Spring</b>		
CE 412	HYDROLOGY	4
CE 481 or CE 383	REINFORCED CONCRETE I or DESIGN OF STEEL STRUCTURES	4
CE 373	GEOTECHNICAL ENGINEERING II	4
CE 362	REALITY CAPTURE FOR ENGINEERING APPLICATIONS	3
<b>Credits</b>		<b>15</b>
<b>Fourth Year</b>		
<b>Fall</b>		
CE 491	TRANSPORTATION ENGINEERING	3
ENGR 330	+INCLUSIVE AND EQUITABLE ENGINEERING	3
Core Ed: Arts & Humanities General		3-4
Technical Elective		4
Elective		3
<b>Credits</b>		<b>16</b>
<b>Winter</b>		
CE 418	^CIVIL ENGINEERING PROFESSIONAL PRACTICE	3
CE 420	ENGINEERING PLANNING	4
Technical Elective		3
Core Ed: Seeking Solutions		3-4
<b>Credits</b>		<b>14</b>
<b>Spring</b>		
CE 419	^CIVIL INFRASTRUCTURE DESIGN	3
ENVE 321	ENVIRONMENTAL ENGINEERING FUNDAMENTALS	4
Technical Elective		4
Core Ed: Arts & Humanities Global		3-4
Elective		1
<b>Credits</b>		<b>15</b>
<b>Total Credits</b>		<b>180</b>

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+ Core Education course. Applies to general education requirements for undergraduate students in catalog year 2025-2026 and beyond

^ Writing Intensive Curriculum (WIC) course