MAJOR IN CONSTRUCTION ENGINEERING

CSU recognizes the industry's interest in developing a workforce pipeline of qualified construction engineers ready to make an immediate impact across the Nation. CSU delivers a comprehensive Construction Engineering program with robust course offerings that focus on the excellence required to make this program unique and exceptional. The program is expected to be ABET accredited upon graduation of the first cohort of students in spring 2029.

The program achieves industry expectations and anticipated future needs by including three focus areas aligned with strengths of CSU faculty experts: heavy civil/infrastructure, structures and buildings, and water and environmental systems. The Construction Engineering degree also includes industry-informed curriculum in virtual design and construction and construction safety engineering.

The program includes an engaged industry advisory board with an active commitment to ensure the success of the program and students, and Enrichment Programming with Industry and Peer Mentorship.

Participation in student professional societies, other campus organizations, internships, and volunteer activities is highly recommended to foster personal growth and professional development. The Fundamentals of Engineering (FE) exam is the first step toward registration as a licensed Professional Engineer (PE), an important professional credential for construction engineers. Therefore, students are encouraged to take the FE exam prior to graduation. Additional information on this major is provided on the Department of Civil and Environmental Engineering website (https://www.engr.colostate.edu/ce/undergraduate/construction-engineering/).

Learning Objectives and Outcomes

The Major in Construction Engineering program strives to provide students with the knowledge, training, and opportunity to achieve the primary educational objective of rewarding careers in construction or related fields, in addition to the expectation that these students, within five years of graduation, will:

1. Be successfully employed in engineering, science, technology, or related careers;
2. Assume management or leadership roles;
3. Engage in continual learning by pursuing advanced degrees or additional educational opportunities through coursework, professional conferences and training, and/or participation in professional societies;
4. Pursue professional registration or other appropriate certifications; and
5. Be active in civic engagement.

The outcomes that students are expected to have attained upon graduation with a B.S. in Construction Engineering are the ability to:

1. Apply knowledge of mathematics, science, and engineering;
2. Design and conduct experiments;
3. Analyze and interpret data;
4. Design a sustainable system or component to meet desired performance specifications;
5. Identify, formulate and solve engineering problems;
6. Communicate and demonstrate professional and ethical responsibilities;
7. Communicate effectively through writing and drawing;
8. Communicate effectively through oral presentations;
9. Explain the impact of engineering on society;
10. Engage in life-long learning;
11. Explain contemporary issues in civil, environmental and architectural engineering;
12. Use modern construction engineering tools, skills; and
13. Explain basic concepts in management, business, public policy and leadership.

Requirements Effective Fall 2025

Freshman

		AUCC	Credits
CHEM 111	General Chemistry I (GT-SC2)	3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)	3A	1
CO 150	College Composition (GT-CO2)	1A	3
ENGR 111	Fundamentals of Engineering		3
ENGR 114	Engineering for Grand Challenges		3
MATH 160	Calculus for Physical Scientists I (GT-MA1)	1B	4
MATH 161	Calculus for Physical Scientists II (GT-MA1)	1B	4
PH 141	Physics for Scientists and Engineers I (GT-SC1)	3A	5
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	3
	Total Credits		**30**

Sophomore

CIVE 260	Engineering Mechanics-Statics		3
CIVE 261	Engineering Mechanics-Dynamics		3

CIVE 360	Mechanics of Solids		3
CON 101	Introduction to Construction Management		3
CONE 103	Virtual Design and Construction I		3
CONE 201	Construction Systems and Decision Analysis		3
CONE 203	Virtual Design and Construction II		3
GEOL 120	Geology and Society (GT-SC2)	3A	3
MATH 261	Calculus for Physical Scientists III		4
MECH 237	Introduction to Thermal Sciences		3
	Total Credits		**31**

Junior

CIVE 300	Fluid Mechanics		3
CIVE 302	Evaluation of Civil Engineering Materials		3
CIVE 303	Infrastructure and Transportation Systems		3
CIVE 322	Basic Hydrology		3
CIVE 367	Structural Analysis		3
CONE 301	Engineering Contracts		1
CONE 302	Preconstruction and Project Control Systems		5
CONE 401	Construction Safety Engineering		3
CONE 404	Production Planning of Construction Operation		3
CONE 487	Construction Engineering Internship		1
MATH 340	Intro to Ordinary Differential Equations		4
Design Focus Area Electives (select one course from one Focus Area):			3
Heavy Civil/Infrastructure:			
CIVE 401	Hydraulic Engineering		
CIVE 455	Applications in Geotechnical Engineering		
CIVE 466	Design and Behavior of Steel Structures		
CIVE 467	Design of Reinforced Concrete Structures		
Structures/Buildings:			
CIVE 455	Applications in Geotechnical Engineering		
CIVE 466	Design and Behavior of Steel Structures		
CIVE 467	Design of Reinforced Concrete Structures		
CONE 405	Virtual Design and Construction III		
Water/Environmental Facilities:			
CIVE 330	Ecological Engineering		
CIVE 401	Hydraulic Engineering		
CIVE 405	Sustainable Civil/Environmental Engineering		
CIVE 413	Environmental River Mechanics		
CIVE 423	Groundwater Engineering		
CIVE 437	Wastewater Treatment Facility Design		
CIVE 438	Fundamentals of Environmental Engr		
CIVE 440	Nonpoint Source Pollution		
CIVE 441	Water Quality Analysis and Treatment		
CIVE 458	Environmental Geotechnics		
CONE 410	Environmental Systems in Construction		
	Total Credits		**35**

Senior

CIVE 355	Geotechnical Engineering		3
CIVE 356	Geotechnical Engineering Laboratory		1
CONE 402	Senior Project Design I	4A,4B	3
CONE 403	Senior Project Design II	4A,4C	3

Design Focus Area Electives (select the same Focus Area as Junior year above):			6
Heavy/Civil Infrastructure - select one course from the following not previously taken:			
CIVE 401	Hydraulic Engineering		
CIVE 455	Applications in Geotechnical Engineering		
CIVE 466	Design and Behavior of Steel Structures		
CIVE 467	Design of Reinforced Concrete Structures		
Structures/Buildings - select one course from the following not previously taken:			
CIVE 455	Applications in Geotechnical Engineering		
CIVE 466	Design and Behavior of Steel Structures		
CIVE 467	Design of Reinforced Concrete Structures		
CONE 405	Virtual Design and Construction III		
Water/Environmental Facilities - select one course from the following not previously taken:			
CIVE 330	Ecological Engineering		
CIVE 401	Hydraulic Engineering		
CIVE 405	Sustainable Civil/Environmental Engineering		
CIVE 413	Environmental River Mechanics		
CIVE 423	Groundwater Engineering		
CIVE 437	Wastewater Treatment Facility Design		
CIVE 438	Fundamentals of Environmental Engr		
CIVE 440	Nonpoint Source Pollution		
CIVE 441	Water Quality Analysis and Treatment		
CIVE 458	Environmental Geotechnics		
CONE 410	Environmental Systems in Construction		
1C (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)		1C	3
Advanced Writing (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)		2	3
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)		3B	3
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)		3D	3
Social and Behavioral Sciences (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences)		3C	3
	Total Credits		**31**
	Program Total Credits:		**127**

Major Completion Map

Distinctive Requirements for Degree Program:

TO PREPARE FOR FIRST SEMESTER: The curriculum for this major assumes students enter college prepared to take calculus.

Freshman

Semester 1		**Critical**	**Recommended**	**AUCC**	**Credits**
CHEM 111	General Chemistry I (GT-SC2)	X		3A	4
CHEM 112	General Chemistry Lab I (GT-SC1)		X	3A	1
ENGR 111	Fundamentals of Engineering	X			3
MATH 160	Calculus for Physical Scientists I (GT-MA1)	X		1B	4
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B	3
	Total Credits				**15**
Semester 2		**Critical**	**Recommended**	**AUCC**	**Credits**
CO 150	College Composition (GT-CO2)	X		1A	3
ENGR 114	Engineering for Grand Challenges	X			3
MATH 161	Calculus for Physical Scientists II (GT-MA1)	X		1B	4

PH 141	Physics for Scientists and Engineers I (GT-SC1)	X		3A	5
	Total Credits				**15**
Sophomore					
Semester 3		**Critical**	**Recommended**	**AUCC**	**Credits**
CIVE 260	Engineering Mechanics-Statics	X			3
CON 101	Introduction to Construction Management	X			3
CONE 103	Virtual Design and Construction I	X			3
GEOL 120	Geology and Society (GT-SC2)		X	3A	3
MATH 261	Calculus for Physical Scientists III	X			4
	Total Credits				**16**
Semester 4		**Critical**	**Recommended**	**AUCC**	**Credits**
CIVE 261	Engineering Mechanics-Dynamics	X			3
CIVE 360	Mechanics of Solids	X			3
CONE 201	Construction Systems and Decision Analysis	X			3
CONE 203	Virtual Design and Construction II	X			3
MECH 237	Introduction to Thermal Sciences	X			3
	Total Credits				**15**
Junior					
Semester 5		**Critical**	**Recommended**	**AUCC**	**Credits**
CIVE 300	Fluid Mechanics	X			3
CIVE 302	Evaluation of Civil Engineering Materials	X			3
CIVE 367	Structural Analysis	X			3
CONE 301	Engineering Contracts	X			1
CONE 401	Construction Safety Engineering	X			3
MATH 340	Intro to Ordinary Differential Equations	X			4
	Total Credits				**17**
Semester 6		**Critical**	**Recommended**	**AUCC**	**Credits**
CIVE 303	Infrastructure and Transportation Systems	X			3
CIVE 322	Basic Hydrology	X			3
CONE 302	Preconstruction and Project Control Systems	X			5
CONE 404	Production Planning of Construction Operation	X			3
CONE 487	Construction Engineering Internship	X			1
Design Focus Area Elective (see list on Program Requirements tab)			X		3
	Total Credits				**18**
Senior					
Semester 7		**Critical**	**Recommended**	**AUCC**	**Credits**
CIVE 355	Geotechnical Engineering	X			3
CIVE 356	Geotechnical Engineering Laboratory	X			1
CONE 402	Senior Project Design I	X		4A,4B	3
Design Focus Area Elective (see list on Program Requirements tab)		X			3
1C (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#aucc)			X	1C	3
Advanced Writing (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#advanced-writing)			X	2	3
	Total Credits				**16**
Semester 8		**Critical**	**Recommended**	**AUCC**	**Credits**
CONE 403	Senior Project Design II	X		4A,4C	3
Design Focus Area Elective (see list on Program Requirements tab)		X			3
Arts and Humanities (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#arts-humanities)			X	3B	3
Historical Perspectives (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#historical-perspectives)			X	3D	3

Social and Behavioral Sciences (https://catalog.colostate.edu/general-catalog/all-university-core-curriculum/aucc/#social-behavioral-sciences) The benchmark courses for the 8th semester are the remaining courses in the entire program of study.	X	3C	3
Total Credits			**15**
Program Total Credits:			**127**