

Construction Engineering (BS)

To see more about what you will learn in this program, visit the Learning Outcomes website (<https://apps.oirp.ncsu.edu/pgas/>)!

Construction Engineering Degree

The Construction Engineering curriculum is designed for the student interested in the planning, design, direction, and management of construction projects. It includes the core course requirements in mathematics, the physical sciences, and the humanities and social sciences. After exposure to engineering fundamentals and design of facilities, the curriculum provides a series of specialty courses in construction engineering related to building construction and systems, construction equipment, construction estimating and planning, and legal aspects of contracting. The student also develops skills in accounting, communication, and management. The curriculum is designed for students interested in delivering sustainable construction projects safely and efficiently by using appropriate resources, and means and methods.

Specific curriculum requirements are available on the Office of Undergraduate Courses and Curricula website (<http://catalog.ncsu.edu/undergraduate/engineering/#departmentsandplanstext>).

Educational Objectives in Construction Engineering

Within a few years of graduation alumni of the Construction Engineering program will:

1. Function successfully in careers emphasizing the application of construction engineering and management principles with the ability to solve a broad set of engineering problems in construction.
2. Practice construction engineering including the design and management of the construction process to achieve needed safety, quality, durability, sustainability, schedule, and economic objectives for various stakeholders.
3. Function in team-oriented, multi-disciplinary, open-ended engineering activities considering the societal and economic impacts of construction, and the professional and ethical responsibilities of the construction engineer.
4. Engage in life-long learning through graduate study, self study, or continuing education; pursue licensure; provide mentoring to those under their supervision and influence; and provide leadership in their employment organizations, industry associations and professional societies.

Plan Requirements

Code	Title	Hours	Counts towards
College Requirements			
E 101 & E 115	Introduction to Engineering & Problem Solving and Introduction to Computing Environments	2	
EC 205	Fundamentals of Economics	3	

or EC 201 or ARE 201	Principles of Microeconomics Introduction to Agricultural & Resource Economics	
E 102	Engineering in the 21st Century	2
Math		
MA 141	Calculus I	4
MA 241	Calculus II	4
MA 242	Calculus III	4
Sciences		
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory	4
PY 208 & PY 209	Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory	4
CE Major		
CE 214	Engineering Mechanics-Statics	3
CE 225	Mechanics of Solids	3
CE 250	Introduction to Sustainable Infrastructure	3
CE 263	Introduction to Construction Engineering	3
CE 282	Hydraulics	3
CE 301	Civil Engineering Surveying and Geomatics	3
CE 327	Reinforced Concrete Design	3
CE 332	Civil Engineering Materials	4
CE 342	Engineering Behavior of Soils and Foundations	4
CE 365	Construction Equipment and Methods	3

CE 367	Mechanical and Electrical Systems in Buildings	3
CE 463	Construction Estimating, Planning, and Control	3
CE 464	Legal Aspects of Contracting	3
CE 466	Building Construction Engineering	3
CE 469	Construction Engineering Project	3
Engineering Elective (choose one of the following)		3
CE 426	Structural Steel Design	
CE 499	Undergraduate Research Thesis in Civil, Construction and Environmental Engineering	
Advised elective from the CE course list		
Other Major		
CSC 111	Introduction to Computing: Python	3
MEA 101	Geology I: Physical	3
ACC 280	Survey of Financial and Managerial Accounting	3
TDE 220	Civil Engineering Graphics	3
MSE 200	Mechanical Properties of Structural Materials	3
ST 370	Probability and Statistics for Engineers	3
COM 110 or ENG 331	Public Speaking Communication for Engineering and Technology	3
Basic Science Elective (choose one of the following)		3
SSC 200	Soil Science	
FOR 260	Forest Ecology	
FW 221	Conservation of Natural Resources	

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GEP Courses

ENG 101 Academic Writing and Research 4

GEP Humanities (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/>) 6

GEP Health and Exercise Studies (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/>) 2

GEP Additional Breadth (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/>) 3

GEP Interdisciplinary Perspectives (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/>) 3

GEP Global Knowledge (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/>)

GEP U.S. Diversity (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/>)

Foreign Language Proficiency (<http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/>) (verify requirement)

Total Hours 126

Management Science Electives (p. 2)

Code	Title	Hours	Counts towards
SOC 205	Jobs and Work	3	
SOC 301	Human Behavior	3	
SOC/AFS 305	Racial and Ethnic Relations	3	
PS 202	State and Local Government	3	
PS 310	Public Policy	3	
PS 312	Introduction to Public Administration	3	
PS 314	Science, Technology and Public Policy	3	
PS 320	U.S. Environmental Law and Politics	3	

Semester Sequence

This is a sample.

Term Sequence

First Year

Fall Semester		Hours
CH 101 & CH 102	Chemistry - A Molecular Science and General Chemistry Laboratory	4
E 101	Introduction to Engineering & Problem Solving	1
E 115	Introduction to Computing Environments	1
ENG 101	Academic Writing and Research	4
MA 141	Calculus I	4
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
Hours		15

Spring Semester

EC 205	Fundamentals of Economics ¹	3
MA 241	Calculus II	4
PY 205 & PY 206	Physics for Engineers and Scientists I and Physics for Engineers and Scientists I Laboratory	4
E 102	Engineering in the 21st Century ¹	2
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) ¹		3
Hours		16

Second Year

Fall Semester		Hours
CSC 111	Introduction to Computing: Python	3
CE 214	Engineering Mechanics-Statics	3
TDE 220	Civil Engineering Graphics	3
MA 242	Calculus III	4
CE 250	Introduction to Sustainable Infrastructure	3
Hours		16

Spring Semester

PY 208 & PY 209	Physics for Engineers and Scientists II and Physics for Engineers and Scientists II Laboratory	4
ST 370	Probability and Statistics for Engineers	3
CE 225	Mechanics of Solids	3
CE 365	Construction Equipment and Methods	3
CE 263	Introduction to Construction Engineering	3
GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)		1
Hours		17

Third Year

Fall Semester		Hours
MSE 200	Mechanical Properties of Structural Materials	3
CE 301	Civil Engineering Surveying and Geomatics	3
CE 327	Reinforced Concrete Design	3

CE 282	Hydraulics	3
CE 463	Construction Estimating, Planning, and Control	3

Hours 15

Spring Semester

CE 332	Civil Engineering Materials	4
CE 342	Engineering Behavior of Soils and Foundations	4
CE 367	Mechanical and Electrical Systems in Buildings	3
MEA 101	Geology I: Physical	3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) ¹		3

Hours 17

Fourth Year

Fall Semester

CE 466	Building Construction Engineering	3
Select one of the following Engineering Electives: ⁴		3
CE 426	Structural Steel Design	
CE 499	Undergraduate Research Thesis in Civil, Construction and Environmental Engineering	
ACC 280	Survey of Financial and Managerial Accounting	3
COM 110 or ENG 331	Public Speaking or Communication for Engineering and Technology	3
Select one of the following Basic Science Electives:		3
FOR 260	Forest Ecology	
FW 221	Conservation of Natural Resources	
SSC 200	Soil Science	

Hours 15

Spring Semester

CE 464	Legal Aspects of Contracting	3
CE 469	Construction Engineering Project	3
Management Science Elective (p. 2) ^{1,2}		3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) ¹		3
GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) ¹		3

Hours 15

Total Hours 126

¹ GEP Requirements to be selected from the appropriate lists in consultation with the advisor.

² Management Science Elective (2nd Soc Sci GEP) - Select one: SOC 205, SOC 301, SOC 305/AFS 305 (USD), PS 202, PS 310, PS 312, PS 314, or PS 320.

³ Basic Science Elective - Select one: SSC 200, FOR 260, or FW 221

⁴ Engineering Elective – Select one: CE 426, CE 499, or an advised elective from CE course list

* Foreign Language Proficiency at the FL_102 level is required for graduation.

Code	Title	Hours	Counts towards
GEP Courses			
	GEP Humanities (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-humanities/)	6	
	GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/)	2	
	GEP Additional Breadth (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) (Humanities/Social Sciences/Visual and Performing Arts)	3	
	GEP Interdisciplinary Perspectives (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-interdisciplinary-perspectives/)	3	
	GEP U.S. Diversity (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-us-diversity/) (verify requirement)		
	GEP Global Knowledge (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-global-knowledge/) (verify requirement)		
	Foreign Language Proficiency (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/foreign-language-proficiency/) (verify requirement)		

Career Opportunities

Society will always need constructed facilities to live, work, and sustain their lives and environment, and civil, construction, and environmental engineers will always be needed to plan, design, and construct these facilities. Civil, construction, and environmental engineering comprise such diversified fields that graduates have a wide choice in types and locations of employment. Jobs range from federal, state, or municipal agencies to a variety of manufacturing and processing industries, consulting firms or construction companies. The work may be performed partially or wholly in an office or in the field and may be located in a small community, a big city, an industrial center, or even in a foreign country. Careers in either professional practice or teaching and research are common for many graduates who complete advanced degrees.