

# BS in Construction Engineering & Management

---

The B.S. in Construction Engineering and Management (BCEM) provides students with the knowledge and skills to become both construction engineers as well as construction managers.

## Program Educational Objectives

A critical goal of the CEM faculty is to provide undergraduate students of varying backgrounds and abilities every opportunity for achieving success in the Construction profession. To address this goal, the Program Educational Objectives for the Bachelor of Science program have been established with input from alumni, students, and industry representatives. The mission of the BCEM program is to produce students capable of functioning an entry level in construction management. The Construction Engineering and Management program accomplishes its mission by defining the following educational objectives for students who:

- a. Will lead, represent, advance, and contribute to public safety and the profession in their communities and globally.
- b. Will be well-rounded and ethical professionals displaying strong technical, managerial, and interpersonal skills.
- c. Will be effective at communicating with diverse multi-disciplinary populations.
- d. Will effectively reinforce their knowledge with real world experiences and apply their education to be lifelong learners and contribute to innovation in construction.
- e. Will enrich the quality of life and sustainability of communities by providing ethical solutions to complex construction problems considering dynamic social, political, technological, and economic realities.
- f. Will contribute to problem-solving, quality management and improvement of personal and organizational skills.

## Program Student Outcomes

The program student's outcomes are in line with the learning outcomes described by the Accreditation Board for Engineering and Technology (ABET).

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

## Marketable Skills

1. Communication: Reach mutual understanding through the effective exchange of information, ideas, and feelings
2. Critical thinking: Analyze and evaluate issues in order to solve problems and develop informed opinions
3. Listening: Be able to accurately receive and interpret messages during a conversation
4. Organization: Use resources effectively and efficiently in order to stay focused on different tasks
5. Problem-solving: Find solutions to difficult or complex issues
6. Teamwork: Participate as an effective, efficient member of a group in order to meet a common goal
7. Writing: Be able to write in a clear and comprehensible manner to the reader

Additionally, students will learn Claims Avoidance and Schedule Management.

## Fast Track

The Fast-Track Program (<http://catalog.utep.edu/admissions/undergraduate/fast-track/#text>) enables outstanding undergraduate UTEP students to receive both undergraduate and graduate credit for up to 15 hours of UTEP course work as determined by participating Master's and Doctoral programs.

Not all undergraduate programs have elected to participate in the Fast Track option, so students should see their departmental graduate advisor for information about requirements and guidelines. A list of courses that have been approved for possible use at the graduate level is found here (<http://catalog.utep.edu/admissions/undergraduate/fast-track/#fasttrackcoursestext>).

## Degree Plan

Required Credits: 120

Code	Title	Hours
<b>University Core Curriculum (All courses require a grade of C or better.)</b>		
Complete the University Core Curriculum requirements. (p. 3)		42
<b>Designated Core (All courses require a grade of C or better.)</b>		
Required Courses:		
CE 2326	Econ for Engrs & Scientists	3
CHEM 1105	Laboratory for CHEM 1305	1
CHEM 1305	General Chemistry	3
COMM 1302	Business/Profession Comm	3
GEOL 1111	Principles of Earth Sci - Lab	1
GEOL 1211	Principles of Earth Sciences	2
MATH 1508	Precalculus ((Listed if completed, but not required))	3-5
or MATH 1310	Trigonometry and Conics	
or MATH 1411	Calculus I	
UNIV 1301	Seminar/Critical Inquiry	3
<b>Foundational Math &amp; Science</b>		
Required Courses:		
MATH 1312	Calculus II	3
MATH 1411	Calculus I	4
MATH 2313	Calculus III	3
<b>Construction Engineering &amp; Management (Lower) (All courses require a grade of C or better.)</b>		
Required Courses:		
ACCT 2301	Principles of Accounting I	3
CE 1301	Civil Engineering Fundamentals	3
CE 1313	Engineering Measurements	3
CE 2315	Statics	3
CE 2334	Mechanics of Materials	3
CE 2335	Geological Engineering	3
CE 2343	Structural Analysis	3
CE 2373	Engr Probability & Statistics	3
CE 2375	Intro to Fluid Mechanics	3
<b>Construction Engineering &amp; Management (Upper)</b>		
Required Courses:		
BLAW 3301	Legal Environment of Business	3
CE 3334	Construction Management	3
CE 3336	Civil Engineering Materials	3
CE 3348	Geotechnical Engineering	3
CE 4158	Constr Methods & Matrls Lab	1
CE 4339	Geostructural Design	3
CE 4354	Electrical & Mech Construction	3
CE 4358	Construction Methods & Materls	3
CE 4382	Constr. Cost Analys. & Bidding	3
CE 4385	Construction Internship	3
CE 4381	Senior Construction Project	3
CE 4386	Construction Law & Ethics	3
CE 4387	Construction Scheduling	3
CE 4389	Construction Safety	3
FIN 3310	Business Finance	3
<b>Total Hours</b>		<b>120</b>

**C**

Courses require a grade of C or better.

## University Core Curriculum

The department may make specific suggestions for courses which are most applicable towards your major.

All courses require a C or better

### I. Communication (six hours)

Code	Title	Hours
The objective of the communication component is to enable the student to communicate effectively in clear and correct prose or orally in a style appropriate to the subject, occasion, and audience.		
Select six hours of the following:		6
For students whose secondary education was in English:		
COMM 1611	Written and Oral Communication	
ENGL 1313	Writing About Literature	
RWS 1301	Rhetoric & Composition I	
RWS 1302	Rhetoric & Composition 2	
RWS 1601	Rhetoric, Composition & Comm	
For students whose secondary education was not in English:		
ESOL 1311	Expos Engl Compos-Spkr Esl	
ESOL 1312	Res & Crit Writng Spkr Esl	
<b>Total Hours</b>		<b>6</b>

### II. American History (six hours)

Code	Title	Hours
The objectives of the history component are to expand students' knowledge of the origin and history of the U.S., their comprehension of the past and current role of the U.S. in the world, and their ability to critically evaluate and analyze historical evidence. U.S. history courses (three hours must be Texas history) include:		
HIST 1301	History of U.S. to 1865	3
HIST 1302	History of U.S. Since 1865	3
<b>Total Hours</b>		<b>6</b>

### III. Language, Philosophy & Culture (three hours)

Code	Title	Hours
The objective of the humanities component is to expand students' knowledge of the human condition and human cultures, especially in relation to behaviors, ideas, and values expressed in works of human imagination and thought. Through study in disciplines such as literature and philosophy, students engage in critical analysis and develop an appreciation of the humanities as fundamental to the health and survival of any society.		
Select one of the following:		3
AFST 2300	Intro-African Amer Studies	
CHIC 2302	Latina/o Presence in the U.S.	
ENGL 2311	English Literature	
ENGL 2312	English Literature	
ENGL 2313	Intro to American Fiction	
ENGL 2314	Intro to American Drama	
ENGL 2318	Intro to American Poetry	
FREN 2322	Making of the "Other" Americas	
HIST 2301	World History to 1500	
HIST 2302	World History Since 1500	
PHIL 1301	Introduction to Philosophy	
PHIL 2306	Ethics	
RS 1301	Introduct to Religious Studies	
SPAN 2340	Seeing & Naming: Conversations	
WS 2300	Introduction to Womens Studies	

WS 2350	Global Feminisms	
<b>Total Hours</b>		<b>3</b>

#### IV. Mathematics (three hours)

Code	Title	Hours
------	-------	-------

The objective of the mathematics component is to develop a quantitatively literate college graduate. Every college graduate should be able to apply basic mathematical tools in the solution of real-world problems.

Select one of the following: 3

MATH 1309	College Algebra	
MATH 1310	Trigonometry and Conics	
MATH 1319	Math in the Modern World	
MATH 1320	Math for Social Sciences I	
MATH 1411	Calculus I	
MATH 1508	Precalculus <sup>1,2</sup>	
MATH 2301	Math for Social Sciences II	
STAT 1380	Statistical Literacy	
STAT 2480	Elementary Statistical Methods	

1 A higher-level course in the calculus sequence can be substituted.

2 TCCN MATH 1314 will also satisfy this requirement.

<b>Total Hours</b>		<b>3</b>
--------------------	--	----------

#### V. Life & Physical Sciences (six hours)

Code	Title	Hours
------	-------	-------

The objective of the study of the natural sciences is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the bases for building and testing theories. The courses listed are for non-majors; the major courses in the discipline can be substituted for the non-major sequence. A minimum of two semesters of lecture and one semester of laboratory associated with one of the courses, or two semesters of combined (3 credit) lecture-laboratory courses (Only six hours apply toward the required 42.):

Select one of the following: 1-4

ASTR 1107	Astronomy Lab I	
ASTR 1307	Elem Astronomy-Solar System	
ASTR 1308	Elem Astr Stars & Galaxies	
BIOL 1103	Introductory Biology Lab	
BIOL 1104	Human Biology Laboratory	
BIOL 1107	Topics in Study of Life I	
BIOL 1108	Organismal Biology Laboratory	
BIOL 1203	Introductory Biology	
BIOL 1304	Human Biology	
BIOL 1305	General Biology	
BIOL 1306	Organismal Biology	
BIOL 2111	Human Anat/Physio Lab I	
BIOL 2113	Human Anat/Physio Lab II	
BIOL 2311	Human Anat/Physiology I	
BIOL 2313	Human Anat/Physiology II	
CHEM 1105	Laboratory for CHEM 1305	
CHEM 1106	Laboratory for CHEM 1306	
CHEM 1107	Intro General Chemistry Lab	
CHEM 1108	Intro Organic & Biochem Lab	
CHEM 1305	General Chemistry	
CHEM 1306	General Chemistry	
CHEM 1307	Intro to General Chemistry	
CHEM 1308	Intro Organic & Biochemistry	
ESCI 1101	Environmental Sci. Lab	

ESCI 1102	Non-major Lab for ESCI 1301
ESCI 1202	Intro to Environment Science 2
ESCI 1301	Intro to Environmental Sci
GEOG 1106	Laboratory for GEOG 1306
GEOG 1306	Physical Geography
GEOL 1103	Lab for GEOL 1313
GEOL 1104	Lab for GEOL 1314
GEOL 1111	Principles of Earth Sci - Lab
GEOL 1112	Laboratory for Geology 1212
GEOL 1211	Principles of Earth Sciences
GEOL 1212	Principles of Earth Science
GEOL 1230	The Blue Planet
GEOL 1231	Natural Hazards
GEOL 1313	Intro to Physical Geology
GEOL 1314	Intro to Historical Geol
HSCI 2302	Fundamentals of Nutrition
HSCI 2303	Wellness Dynamics
MICR 2330	Microorganisms and Disease
PHYS 1403	General Physics I
PHYS 1404	General Physics II
PHYS 2120	Laboratory for PHYS 2320
PHYS 2121	Laboratory for PHYS 2321
PHYS 2320	Introductory Mechanics
PHYS 2321	Introductory Electromagnetism

**Total Hours** **6**

## VI. Political Science (six hours)

Code	Title	Hours
------	-------	-------

The objectives of the political science component are to expand students' knowledge of the origin and evolution of the U.S. and Texas political systems, focusing on the growth of political institutions, and on the constitutions of Texas and the United States; and to enhance their understanding of federalism, states rights, and individual civil liberties, rights, and responsibilities.

Required Courses:

POLS 2310	Introduction to Politics	3
POLS 2311	American Gover & Politics	3

**Total Hours** **6**

## VII. Social and Behavioral Sciences (three hours)

Code	Title	Hours
------	-------	-------

The objective of the social and behavioral science component is to increase students' knowledge of how social and behavioral scientists discover, describe, and explain the behaviors and interactions among individuals, groups, institutions, events, and ideas. Such knowledge will better equip students to understand themselves and the roles they play in addressing the issues facing humanity.

Select one of the following: 3

ANTH 1301	Intro-Phys Anth/Archeolog
ANTH 1302	Intro-Cultural Anthropology
ANTH 1310	Cultural Geography
ANTH 2320	Intro to Linguistics
CE 2326	Econ for Engrs & Scientists
ASIA 2300	Asian American Studies
COMM 2350	Interpersonal Communication
COMM 2372	Mass Media and Society
ECON 2303	Principles of Macroeconomics
ECON 2304	Principles of Microeconomics
EDPC 1301	Introduction to Ed Psychology

EDU 1342	Action Research in Classrooms
ENGL 2320	Introduction to Linguistics
GEOG 1310	Cultural Geography
LEAD 2300	Community Service
LING 2320	An Intro. to Linguistics
LING 2340	Lang. Inside & Out: Sel Topics
PSYC 1301	Introduction to Psychology
SOCI 1301	Introduction to Sociology
SOCI 1310	Cultural Geography
<b>Total Hours</b>	<b>3</b>

### VIII. Creative Arts (three hours)

Code	Title	Hours
The objective of the visual and performing arts component is to expand students' knowledge and appreciation of the human imagination as expressed through works of visual art, dance, music, theatre and film. Through study in these disciplines, students will form aesthetic judgments and develop an appreciation of the arts as fundamental to the health and survival of any society.		
Select one of the following:		
ART 1300	Art Appreciation	3
ARTH 1305	History of Art I	
ARTH 1306	History of Art II	
CHIC 1311	Chicana/o Fine Arts Appreciat	
DANC 1304	Dance Appreciation	
FILM 1390	Intro-Art of Motion Pict.	
MUSL 1324	Music Appreciation	
MUSL 1327	Jazz to Rock	
MUSL 2321	Music, Culture, and Society	
THEA 1313	Introduction to Theatre	
<b>Total Hours</b>		<b>3</b>

### IX. Component Area Option (six hours)

Code	Title	Hours
The objective of the institutionally designated option component is to develop the critical thinking skills and academic tools required to be an effective learner. Special emphasis is placed on the use of technology in problem-solving, communications, and knowledge acquisition.		
Select two of the following:		
BUSN 1301	Intro to Global Business	6
COMM 1301	Public Speaking	
COMM 1302	Business/Profession Comm	
CS 1310	Intro-Computational Thinking	
CS 1320	Computer Programming Sci/Engr	
EL 1301	Eng Innovation and Leadership	
LEAD 1300	Introduction to Leadership	
SCI 1301	Inquiry in Math & Science	
UNIV 1301	Seminar/Critical Inquiry	
<b>Total Hours</b>		<b>6</b>

## 4-Year Sample Degree Plan

### BS Construction Engineering & Management (Starting with Pre-Calculus)

Code	Title	Hours
<b>BACHELOR OF SCIENCE IN CONSTRUCTION ENGINEERING &amp; MANAGEMENT</b>		
<b>Summer</b>		
(if needed)		
MATH 1508	Precalculus <sup>4</sup>	

or MATH 1310	Trigonometry and Conics	
<b>FRESHMAN</b>		
<b>Fall</b>		
CE 1301	Civil Engineering Fundamentals <sup>1</sup>	3
GEOL 1211 & GEOL 1111	Principles of Earth Sciences and Principles of Earth Sci - Lab <sup>1</sup>	3
MATH 1411	Calculus I <sup>1</sup>	4
RWS 1301	Rhetoric & Composition I <sup>1</sup>	3
UNIV 1301	Seminar/Critical Inquiry <sup>1</sup>	3
<b>Spring</b>		
CE 1313	Engineering Measurements <sup>1</sup>	3
CE 2315	Statics <sup>1</sup>	3
CHEM 1305 & CHEM 1105	General Chemistry and Laboratory for CHEM 1305 <sup>1</sup>	4
MATH 1312	Calculus II <sup>1</sup>	3
RWS 1302	Rhetoric & Composition 2 <sup>1</sup>	3
<b>SOPHOMORE</b>		
<b>Fall</b>		
ACCT 2301	Principles of Accounting I <sup>1</sup>	3
CE 2334	Mechanics of Materials <sup>1</sup>	3
CE 2335 or GEO 3321	Geological Engineering <sup>1</sup>	3
MATH 2313	Calculus III <sup>1</sup>	3
HIST 1301	History of U.S. to 1865 <sup>1</sup>	3
<b>Spring</b>		
CE 2343	Structural Analysis <sup>1</sup>	3
CE 2373 or IE 3373	Engr Probability & Statistics <sup>1</sup> Engr Probability & Stat Models	3
CE 2375	Intro to Fluid Mechanics <sup>1</sup>	3
HIST 1302	History of U.S. Since 1865 <sup>1</sup>	3
Creative Arts Elective <sup>*3,1</sup>		3
<b>JUNIOR</b>		
<b>Fall</b>		
BLAW 3301	Legal Environment of Business	3
CE 2326	Econ for Engrs & Scientists <sup>1</sup>	3
CE 3334	Construction Management	3
CE 3336	Civil Engineering Materials	3
POLS 2310	Introduction to Politics <sup>1</sup>	3
<b>Spring</b>		
CE 3348	Geotechnical Engineering	3
COMM 1302	Business/Profession Comm <sup>1</sup>	3
FIN 3310	Business Finance	3
POLS 2311	American Gover & Politics <sup>1</sup>	3
Language Phil. & Cult. Elective <sup>*2,1</sup>		3
<b>SENIOR</b>		
<b>Fall</b>		
CE 4158	Constr Methods & Matrls Lab	1
CE 4339	Geostructural Design	3
CE 4354	Electrical & Mech Construction	3
CE 4358 & CE 4158	Construction Methods & Materls and Constr Methods & Matrls Lab	4
CE 4382	Constr. Cost Analys. & Bidding	3
<b>Spring</b>		

CE 4385	Construction Internship	3
CE 4386	Construction Law & Ethics	3
CE 4387	Construction Scheduling	3
CE 4389	Construction Safety	3
CE 4381	Senior Construction Project	3

**Notes:**

\*Prerequisite Course

\*+Corequisite if scheduled for the same semester.

1 A grade of "C" or better must be achieved for all Lower-Division courses, including the Arts and Humanities electives, as well as CE 2373 (IE 3373) &amp; CE 2335 (GEOL 3321)

2 Select a Lang. Philosophy and Culture course from ENGL 2311, 2312, 2313, 2314, 2318; FREN 2322; HIST 2301, 2302; PHIL 1301, 2306; RS 1301; SPAN 2340; WS 2300, 2350

3 Select an ART course from ART 1300; ARTH 1305, 1306; DANC 1304; MUSL 1324, 1327, 2321; THEA 1313; FILM 1390

4 Not required for Calculus I ready students

<b>Total Hours</b>	<b>121</b>
--------------------	------------

**BS Construction Engineering & Management (Starting with Calculus)**

Code	Title	Hours
<b>BACHELOR OF SCIENCE IN CONSTRUCTION ENGINEERING &amp; MANAGEMENT</b>		
<b>FRESHMAN</b>		
<b>Fall</b>		
CE 1301	Civil Engineering Fundamentals <sup>1</sup>	3
GEOL 1211 & GEOL 1111	Principles of Earth Sciences and Principles of Earth Sci - Lab <sup>1</sup>	3
MATH 1411	Calculus I <sup>1</sup>	4
RWS 1301	Rhetoric & Composition I <sup>1</sup>	3
UNIV 1301	Seminar/Critical Inquiry <sup>1</sup>	3
<b>Spring</b>		
CE 1313	Engineering Measurements <sup>1</sup>	3
CE 2315	Statics <sup>1</sup>	3
CHEM 1305 & CHEM 1105	General Chemistry and Laboratory for CHEM 1305 <sup>1</sup>	4
MATH 1312	Calculus II <sup>1</sup>	3
RWS 1302	Rhetoric & Composition 2 <sup>1</sup>	3
<b>SOPHOMORE</b>		
<b>Fall</b>		
ACCT 2301	Principles of Accounting I <sup>1</sup>	3
CE 2334	Mechanics of Materials <sup>1</sup>	3
CE 2335 or GEO 3321	Geological Engineering <sup>1</sup>	3
HIST 1301	History of U.S. to 1865 <sup>1</sup>	3
MATH 2313	Calculus III <sup>1</sup>	3
<b>Spring</b>		
CE 2343	Structural Analysis <sup>1</sup>	3
CE 2373 or IE 3373	Engr Probability & Statistics <sup>1</sup> Engr Probability & Stat Models	3
CE 2375	Intro to Fluid Mechanics <sup>1</sup>	3
HIST 1302	History of U.S. Since 1865 <sup>1</sup>	3
Creative Arts Elective <sup>*3,1</sup>		3
<b>JUNIOR</b>		
<b>Fall</b>		
BLAW 3301	Legal Environment of Business	3
CE 2326	Econ for Engrs & Scientists <sup>1</sup>	3



CE 3334	Construction Management	3
CE 3336	Civil Engineering Materials	3
POLS 2310	Introduction to Politics <sup>1</sup>	3

**Spring**

CE 3348	Geotechnical Engineering	3
COMM 1302	Business/Profession Comm <sup>1</sup>	3
FIN 3310	Business Finance	3
POLS 2311	American Gover & Politics <sup>1</sup>	3
Language Phil. & Cult. Elective <sup>*2,1</sup>		3

**SENIOR****Fall**

CE 4158	Constr Methods & Matrls Lab	1
CE 4339	Geostructural Design	3
CE 4354	Electrical & Mech Construction	3
CE 4358 & CE 4158	Construction Methods & Materls and Constr Methods & Matrls Lab	4
CE 4382	Constr. Cost Analys. & Bidding	3

**Spring**

CE 4385	Construction Internship	3
CE 4386	Construction Law & Ethics	3
CE 4387	Construction Scheduling	3
CE 4389	Construction Safety	3
CE 4381	Senior Construction Project	3

**Notes:**

\*Prerequisite Course

\*+Corequisite if scheduled for the same semester.

1 A grade of "C" or better must be achieved for all Lower-Division courses, including the Arts and Humanities electives, as well as CE 2373 (IE 3373) & CE 2335 (GEOL 3321)

2 Select a Lang. Philosophy and Culture course from ENGL 2311, 2312, 2313, 2314, 2318; FREN 2322; HIST 2301, 2302; PHIL 1301, 2306; RS 1301; SPAN 2340; WS 2300, 2350

3 Select an ART course from ART 1300; ARTH 1305, 1306; DANC 1304; MUSL 1324, 1327, 2321; THEA 1313; FILM 1390

4 Not required for Calculus I ready students

**Total Hours****121**