

# CIVIL ENGINEERING 3+2 PROGRAM, BACHELOR OF SCIENCE IN CIVIL ENGINEERING/MASTER OF SCIENCE

## Specific Admission Requirements

Students should apply by submitting a completed MS Civil Engineering application form no later than the spring before the senior year.

Students are required to have a 3.0 GPA for admission to the 3+2 program. Students must complete all required 300-level courses for the Civil Engineering BS degree before enrolling in graduate-level courses.

## Student Learning Outcomes

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. 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.
3. 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.
4. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
6. Acquire and apply new knowledge as needed, using appropriate learning strategies.
7. Identify, formulate, and solve complex and advance civil engineering problems by applying principles of engineering, science, and mathematics.
8. Apply civil engineering design to an advanced level 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.
9. Recognize ethical and professional responsibilities in complex and advanced engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
10. Acquire and apply new knowledge in broader civil engineering areas as needed using appropriate learning and research strategies.

## Outcomes Assessment Activities

- Students will be assessed and evaluated with an array of activities such as critical thinking assignment, homework, class exams, semester assignment, final exams and so on.

## Specific Program Requirements

Requirement	Credits
General Education	24
Undergraduate Requirements*	104
Graduate Requirements*	18-21
<b>Total Credits</b>	<b>146-149</b>

\*12 credits of 500-level courses will be applied to both Undergraduate and Graduate Degrees.

Students in the BSCE/MS program must complete the following:

- The requirements for the Civil Engineering, Bachelor of Science in Civil Engineering degree.
- The requirements for the Civil Engineering, Master of Science degree.

## Undergraduate Requirements

Course	Title	Credits
<b>General Education</b>	CID 103 is preferred for Humanities	<b>24</b>
<b>Required Courses</b>		<b>95</b>
CE 101	Introduction to Civil Engineering	2
CE 233	Strength of Materials with Lab	3
CE 321	Geotechnical Engineering I	3
CE 331	Structural Analysis	3
CE 341	Introduction to Transportation Engineering	3
CE 351	Hydraulics with Lab	3
CE 361	Construction Engineering	4
CE 421	Geotechnical Engineering II	3
CE 473	Highway Design	3
CE 487	Senior Project Seminar	1
CE 489	Senior Design Project	3
CE 504	Structural Steel Design	3
CE 505	Reinforced Concrete Design	3
CE 512	Hydrology	3
CE 515	Water & Sewer System Design	3
CET 102	Surveying I	3
CET 208	Concrete and Asphalt Materials	3
CET 115	Civil Drafting I	3
CET 116	Civil Drafting II	3
CET 207	Construction Materials and Methods	3
EN 103	Problem Solving for Engineers	3
EN 211	Engineering Mechanics I	3
EN 212	Engineering Mechanics II	3
EN 375	Stochastic Systems Engineering	3
MATH 207	Matrix and Vector Algebra with Applications	3
MATH 126	Calculus & Analytic Geometry I (GT-MA1)	5
MATH 224	Calculus and Analytic Geometry II	5
MATH 337	Differential Equations I	3
PHYS 221	General Physics I	4
PHYS 221L	General Physics I Lab (GT-SC1)	1
CHEM 111	Principles of Chemistry (GT-SC2)	3
CHEM 111L	Principles of Chemistry Lab (GT-SC1)	1
<b>Additional Science Course</b>	Must be BIOL, GEOL, or similar prefix. Must have advisor approval.	<b>3</b>

Technical Electives Must be BSAD, CET, CM, EN, TENG, MGMT, MKTG or similar prefix. Advisor approval required. 6

**Total Credits** 128

## Graduate Requirements

The following credits are applied simultaneously to both the declared undergraduate and graduate degree programs:

Course	Title	Credits
CE 504	Structural Steel Design	3
CE 505	Reinforced Concrete Design	3
CE 512	Hydrology	3
CE 515	Water & Sewer System Design	3
<b>Total Credits</b>		<b>12</b>

Course	Title	Credits
<b>Select from the following:</b> <small>Must have advisor approval.</small>		<b>15</b>
CE 500	Research Methods for Engineering	3
CE 507	Cyber Security for Civil Infrastructures	3
CE 521	Geotechnical Engineering II	3
TENG 505	Multimodal Transportation Systems	3
TENG 510	Transportation Economy & Finance	3
TENG 530	Traffic Engineering	3
TENG 532	Pavement Engineering	3
TENG 540	Railway Transportation	3
TENG 560	Hydrogen Fuel	3

## Electives

Course	Title	Credits
<b>Select from the following:</b> <small>Select courses not used to fulfill major requirements. Must have advisor approval.</small>		<b>9</b>
CE 591	Special Topics	1
CE 592	Research	1
CE 595	Independent Study	1
CE 598	Internship	1
EN 511	Structural Engineering	3
EN 513	Artificial Intelligence	3
EN 520	Simulation Experiments	4
EN 543	Quality Control and Reliability	3
EN 577	Operations Planning and Control	3

## Thesis Option

Course	Title	Credits
CE 599	Thesis	6

## Non-Thesis Option

Students must take an additional 9 credits with advisor approval.

- Courses must be 500-level or higher.
- Courses must have CE, EN, or TENG prefix.

## Specific Graduation Requirements

- The completion of the required credit hours with the minimum GPA of 3.0.