

# CIVIL ENGINEERING, BACHELOR OF SCIENCE (BS)

## Program Learning Outcomes

### Student Outcomes

Upon graduation, students will have:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- 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
- An ability to communicate effectively with a range of audiences
- 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
- 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
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

## Related Links

Civil Engineering, BS Program Page (<https://www.sru.edu/academics/majors-and-minors/civil-engineering/>)

Civil Engineering Fact Sheet URL (<https://www.sru.edu/documents/programs/factsheets/undergraduate/CivilEngineering-fs.pdf>)

Professional Licensure/Certification Page (<https://www.sru.edu/students/student-consumer-information/professional-licensures/>)

## Curriculum Guide

### GPA Requirement

Major GPA: 2.00 or higher  
Overall GPA: 2.00 or higher

### Summary\*

Code	Title	Hours
	Rock Studies 2 Requirements	41
	Other Basic Requirements	0-3
	Major/Concentration Requirements	84
	Natural Science and Math College-Wide Requirements	12
	Elective	3

\* All undergraduate degree programs require a minimum of 120 credits. Some courses meet multiple requirements, but are only counted once toward the 120 credit total required to graduate.

## Rock Studies 2 Requirements

Code	Title	Hours
<b>The Rock</b>		
SUBJ 139	Foundations of Academic Discovery <sup>1</sup>	3
ENGL 102	Critical Writing	3
ENGL 104	Critical Reading	3
MATH 225	Calculus I	4
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	
Subtotal		16
<b>Integrated Inquiry</b>		
<i>Creative and Aesthetic Inquiry</i>		
Select 3 Credits ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/">https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/</a> )		3
<i>Humanities Inquiry</i>		
Select 3 Credits ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/">https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/</a> )		3
<i>Social Science Inquiry</i>		
Select 3 Credits ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/">https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/</a> )		3
<i>Natural Sciences Inquiry</i>		
CHEM 107	General Chemistry I	3
CHEM 111	General Chemistry I Lab	1
<i>Physical Sciences Inquiry</i>		
PHYS 216	University Physics 1 with Lab	4
Subtotal		17
<b>Additional Rock Studies Requirements</b>		
Required Thematic Thread Coursework:		
MATH 230	Calculus II	4
PHYS 217	University Physics 2 with Lab	4
Subtotal		8
<b>Total Hours</b>		<b>41</b>

<sup>1</sup> Course offered in multiple subjects; cannot take course in first major subject.

## Basic Math Requirement

Check with your adviser or a current degree audit report to see if you have been exempted from this course. The credit earned in this course will not be counted toward the 120 credit hour minimum needed to earn a degree.

Code	Title	Hours
Complete one of the following:		0-3
Meet required minimum SAT or ACT math score OR		
ESAP 110	Beginning Algebra	
<b>Total Hours</b>		<b>0-3</b>

## DIVERSITY, EQUITY, AND INCLUSION REQUIREMENT

Students must take and pass a course with the Diversity, Equity, and Inclusion (DEI) designation prior to graduation. Students can meet this requirement by taking any DEI - designated course in any program at any time during their undergraduate career.

## Major/Concentration Requirements

- 42 major credits must be taken at SRU or PASSHE
- 42 major credits must be taken at the 300 level or above

Code	Title	Hours
<b>Required Engineering Courses</b>		
ENGR 110	Introduction to Engineering <sup>1</sup>	2
ENGR 120	Engineering Design Tools <sup>1</sup>	2
ENGR 130	Engineering Computing Tools <sup>1</sup>	2
ENGR 210	Statics <sup>1</sup>	3
ENGR 220	Engineering Materials <sup>1</sup>	3
ENGR 230	Mechanics of Materials	3
ENGR 231	Mechanics of Materials Lab	1
ENGR 301	Fluid Mechanics <sup>1</sup>	3
ENGR 340	Engineering Economics <sup>1</sup>	3
CIVL 210	Elementary Survey <sup>1</sup>	3
CIVL 310	Structural Engineering <sup>1</sup>	4
CIVL 320	Transportation Engineering <sup>1</sup>	3
CIVL 330	Environmental Engineering <sup>1</sup>	4
CIVL 340	Geotechnical Engineering <sup>1</sup>	3
CIVL 350	Water Resources Engineering <sup>1</sup>	3
CIVL 410	Structural Steel Design <sup>1</sup>	3
CIVL 411	Reinforced Concrete Design	3
CIVL 420	Traffic Engineering <sup>1</sup>	3
CIVL 430	Storm Water Management <sup>1</sup>	3
CIVL 440	Construction Management	3
CIVL 460	Capstone Design I <sup>1</sup>	3
CIVL 461	Capstone Design II	3
Subtotal		63
<b>Engineering Elective</b>		
Select one of the following:		3
ENGR 240	Dynamics	
ENGR 310	Introduction to Electrical Engineering	
ENGR 320	Thermodynamics	
<b>Civil Engineering Electives - 400 Level</b>		
Select two of the following:		6
CIVL 412	Finite Element Analysis	
CIVL 421	Highway Engineering	
CIVL 422	Transportation Terminal Design	
CIVL 431	Environmental Engineering Design	
CIVL 432	Groundwater Hydrology	
CIVL 441	Sustainable Development	
<b>Required Math and Science Courses</b>		
BIOL 105	Environmental Biology	3
MATH 232	Linear Algebra	3
MATH 301	Differential Equations I	3
STAT 350	Applied Statistics	3
Subtotal		21
<b>Total Hours</b>		<b>84</b>

<sup>1</sup> Course counts for 50% of Major requirements and Major GPA

\* Some courses may require pre-requisites. Please see course descriptions to determine if there are any pre-requisites for that specific course.

## FREE ELECTIVE

Code	Title	Hours
Select three credits		3
<b>Total Hours</b>		<b>3</b>

## Natural Science and Math College-Wide Requirements

Code	Title	Hours
CHEM 107	General Chemistry I <sup>1</sup>	3
CHEM 111	General Chemistry I Lab <sup>1</sup>	1
MATH 225	Calculus I <sup>1</sup>	4
PHYS 216	University Physics 1 with Lab	4
<b>Total Hours</b>		<b>12</b>

<sup>1</sup> Course can be counted as a Rock Studies 2 Requirement, but earns credit only once toward your 120-credits total.

## Important Curriculum Guide Notes

This Curriculum Guide is provided to help SRU students and prospective students better understand their intended major curriculum. Enrolled SRU students should note that the My Rock Audit may place already-earned and/or in progress courses in different, yet valid, curriculum categories. Enrolled SRU students should use the My Rock Audit Report and materials and information provided by their faculty advisers to ensure accurate progress towards degree completion. *The information on this guide is current as of the date listed. Students are responsible for curriculum requirements at the time of enrollment at the University.*

PASSHE - Pennsylvania State System of Higher Education Institutions

CIVIL ENGINEERING - BS (6183)

This program is effective as of Fall 2021

Revised 3.31.2022

UCC 10.26.2021

## Recommended Four-Year Plan

Course	Title	Hours
<b>First Year</b>		
<b>Fall</b>		
ENGR 110	Introduction to Engineering	2
CHEM 107 & CHEM 111	General Chemistry I and General Chemistry I Lab	4
ENGL 102	Critical Writing	3
ESAP 101	FIRST Seminar *	0-1
MATH 225	Calculus I	4
SUBJ 139	Foundations of Academic Discovery <sup>2</sup>	3
<b>Hours</b>		<b>16-17</b>
<b>Spring</b>		
ENGR 120	Engineering Design Tools	2
ENGL 104	Critical Reading	3
MATH 230	Calculus II	4
PHYS 216	University Physics 1 with Lab	4

Creative & Aesthetic Inquiry ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/">https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/</a> )	3
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<b>Hours</b>	<b>16</b>
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**Second Year****Fall**

ENGR 130	Engineering Computing Tools	2
BIOL 105	Environmental Biology	3
MATH 301	Differential Equations I	3
ENGR 210	Statics	3
PHYS 217	University Physics 2 with Lab	4

Select one of the following:	3
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COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	

<b>Hours</b>	<b>18</b>
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**Spring**

ENGR 220	Engineering Materials	3
ENGR 230	Mechanics of Materials	3
ENGR 231	Mechanics of Materials Lab	1
STAT 350	Applied Statistics	3
MATH 232	Linear Algebra	3

Social Science Inquiry ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/">https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/</a> )	3
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<b>Hours</b>	<b>16</b>
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**Third Year****Fall**

CIVL 210	Elementary Survey	3
CIVL 310	Structural Engineering	4
CIVL 320	Transportation Engineering	3
CIVL 340	Geotechnical Engineering	3
ENGR 301	Fluid Mechanics	3

<b>Hours</b>	<b>16</b>
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**Spring**

ENGR xxx	Engineering Elective	3
CIVL 330	Environmental Engineering	4
CIVL 350	Water Resources Engineering	3
CIVL 420	Traffic Engineering	3

Humanities Inquiry ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/">https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/</a> )	3
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<b>Hours</b>	<b>16</b>
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**Fourth Year****Fall**

CIVL 410	Structural Steel Design	3
CIVL 411	Reinforced Concrete Design	3
CIVL 430	Storm Water Management	3
CIVL 460	Capstone Design I	3
ENGR 340	Engineering Economics	3

<b>Hours</b>	<b>15</b>
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**Spring**

CIVL 440	Construction Management	3
CIVL 461	Capstone Design II	3
CIVL 4xx	Civil Engineering Elective	3

CIVL 4xx	Civil Engineering Elective	3
Elective		3

<b>Hours</b>	<b>15</b>
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<b>Total Hours**</b>	<b>128</b>
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<sup>1</sup> Recommended: ECON 201 Macroeconomics

<sup>2</sup> Course offered in multiple subjects; cannot take course in first major subject.

\* Students are encouraged to take ESAP 101 as a Free Elective.

\*\* This document is meant to serve as a guide. Some planners may show more than 120 credits because faculty have created flexibility in choosing courses. However, only 120 credits are required to obtain a degree. Please consult with your academic adviser and refer to your curriculum guide prior to registering for courses. This plan should be reviewed, and verified, by you and your academic adviser at least once each academic year.

Major Code: 6183

Revised: 07.27.2023