

# CIVIL ENGINEERING, BACHELOR OF SCIENCE (BS) - ROCK STUDIES

## Program Learning 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/>)

Physics and Engineering Department Page (<https://www.sru.edu/academics/colleges-and-departments/ches/departments/physics-and-engineering/>)

Professional Licensure/Certification Page (<http://www.sru.edu/Documents/offices/PRMA/PLC.pdf>)

If you are a Liberal Studies student, please click here (<http://catalog.sru.edu/undergraduate/health-engineering-sciences/physics-engineering/civil-engineering-bs-liberal/#curriculumguidetext>) for your Curriculum Guide.

## Curriculum Guide

### GPA Requirement

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

### Summary\*

Code	Title	Hours
	Rock Studies Requirements	41
	Other Basic Requirements	0-3
	Computer Competency	0-3
	Major/Concentration Requirements	85

Natural Science and Math College-Wide Requirements	12
Electives	12

\* 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 Requirements

Code	Title	Hours
<b>The Rock</b>		
SUBJ 139	University Seminar <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="http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/</a> )		3
<i>Humanities Inquiry</i>		
Select 3 Credits ( <a href="http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/</a> )		3
<i>Social Science Inquiry</i>		
Select 3 Credits ( <a href="http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/</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 211	General Physics I with Lab	4
Subtotal		17
<b>Additional Rock Studies Requirements</b>		
MATH 230	Calculus II	4
PHYS 213	General Physics III/ Lab	4
Subtotal		8
Total Hours		41

<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		
ACSD 110	Beginning Algebra	
Total Hours		0-3

## Computer Competency

Code	Title	Hours
Demonstrate "computer competency" by one of the following:		0-3
Pass Computer Competency Exam OR		
Select one of the following at SRU or another post-secondary institution:		
CPSC 100	Introduction to Computing for Liberal Arts	
CPSC 110	Computer Concepts	
CPSC 130	Introduction to Computing and Programming	
PE 202	Technology for Wellness	
Total Hours		0-3

## Major/Concentration Requirements

- 45 major credits must be taken at SRU or PASSHE
- 45 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 301	Fluid Mechanics <sup>1</sup>	3
ENGR 340	Engineering Economics <sup>1</sup>	3
ENGR XXX	Engineering Elective <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 420	Traffic Engineering <sup>1</sup>	3
CIVL 430	Storm Water Management <sup>1</sup>	3
CIVL 4XX	Civil Engineering Elective <sup>1</sup>	3
CIVL 4XX	Civil Engineering Elective <sup>1</sup>	3
CIVL 4XX	Civil Engineering Elective <sup>1</sup>	3
CIVL 460	Capstone Design I <sup>1</sup>	3
CIVL 460	Capstone Design I <sup>1</sup>	3
Subtotal		68
<b>Required Math and Science Courses</b>		
PHYS 213	General Physics III/ Lab <sup>1</sup>	4
MATH 240	Linear Algebra and Differential Equations <sup>1</sup>	3
BIOL 101	General Biology	3
STAT 152	Elementary Statistics I	3
MATH/SCIENCE	Mathematics/Science Elective <sup>1</sup>	3
Subtotal		16
Total Hours		84

<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.

## Civil Engineering Electives (CIVL XXX)

Code	Title	Hours
Select three of the following:		9
CIVL 411	Reinforced Concrete Design <sup>1</sup>	
CIVL 412	Finite Element Analysis <sup>1</sup>	
CIVL 421	Highway Engineering <sup>1</sup>	
CIVL 422	Transportation Terminal Design <sup>1</sup>	
CIVL 431	Environmental Engineering Design <sup>1</sup>	
CIVL 432	Groundwater Hydrology <sup>1</sup>	
CIVL 440	Construction Management <sup>1</sup>	
CIVL 441	Sustainable Development <sup>1</sup>	
Total Hours		9

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

## Engineering Electives (ENGR XXX)

Code	Title	Hours
Select one of the following:		3
ENGR 240	Dynamics <sup>1</sup>	
ENGR 310	Introduction to Electrical Engineering <sup>1</sup>	
ENGR 320	Thermodynamics <sup>1</sup>	
Total Hours		3

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

## 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 211	General Physics I with Lab <sup>1</sup>	4
Total Hours		12

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

CIVIL ENGINEERING - BS (6183)

This program is effective as of Fall 2019.

Revised 8-2019

UCC 2.5.2019

## 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

## Recommended Rock Studies Four-Year Plan

Course	Title	Hours
<b>First Year</b>		
<b>Fall</b>		
ENGR 110	Introduction to Engineering	2
ENGL 102	Critical Writing	3
MATH 225	Calculus I	4
PHYS 211	General Physics I with Lab	4
INDS 101	FIRST Seminar	1
{SUBJ 139}	University Seminar	
Hours		14
<b>Spring</b>		
ENGR 120	Engineering Design Tools	2
ENGL 104	Critical Reading	3
MATH 230	Calculus II	4
PHYS 213	General Physics III/ Lab	4
Creative & Aesthetic Inquiry ( <a href="http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/</a> )		3
Hours		16
<b>Second Year</b>		
<b>Fall</b>		
ENGR 130	Engineering Computing Tools	2
MATH 240	Linear Algebra and Differential Equations	3
CHEM 107 & CHEM 111	General Chemistry I and General Chemistry I Lab	4
ENGR 210	Statics	3
BIOL 101	General Biology	3
Hours		15
<b>Spring</b>		
ENGR 220	Engineering Materials	3
ENGR 230	Mechanics of Materials	3
ENGR 301	Fluid Mechanics	3
STAT 152	Elementary Statistics I	3
Social Science Inquiry ( <a href="http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/</a> ) <sup>1</sup>		3
Hours		15
<b>Third Year</b>		
<b>Fall</b>		
CIVL 210	Elementary Survey	3
CIVL 310	Structural Engineering	4
CIVL 320	Transportation Engineering	3
CIVL 330	Environmental Engineering	4
CIVL 340	Geotechnical Engineering	3
Hours		17
<b>Spring</b>		
PHIL 123	Ethics (RSP)	3
ENGR xxx	Engineering Elective	3
CIVL 350	Water Resources Engineering	3
CIVL 410	Structural Steel Design	3

CIVL 420	Traffic Engineering	3
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice (RSP)	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	
Hours		18
<b>Fourth Year</b>		
<b>Fall</b>		
CIVL 430	Storm Water Management	3
CIVL 4xx	Civil Engineering Elective	3
ENGR 340	Engineering Economics	3
CIVL 4xx	Civil Engineering Elective	3
CIVL 460	Capstone Design I	3
Hours		15
<b>Spring</b>		
RSP		3
CIVL 4xx	Civil Engineering Elective	3
Math/Science Elective		3
Humanities Inquiry ( <a href="http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">http://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/</a> )		3
CIVL 460	Capstone Design I <sup>1</sup>	3
Hours		15
Total Hours**		125

<sup>1</sup> Recommended: ECON 201 Macroeconomics

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

Major Code: 6183

Revised: 12-2019

\*\* 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.