INDUSTRIAL AND SYSTEMS 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

Industrial and Systems Engineering, BS Program Page (https://www.sru.edu/academics/majors-and-minors/industrial-and-systems-engineering/)

Industrial and Systems Engineering Fact Sheet URL (https://www.sru.edu/documents/programs/factsheets/undergraduate/industeng-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 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
The Rock		
SUBJ 139	Foundations of Academic Discovery [1]	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
Integrated Inquiry		
Creative and Aesthetic Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Humanities Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Social Science Inquiry		
Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Natural Sciences Inquiry		
CHEM 107	General Chemistry I	3
CHEM 111	General Chemistry I Lab	1
Physical Sciences Inquiry		
PHYS 216	University Physics 1 with Lab	4
Subtotal		17
Additional Rock Studies 2 Requirements		
Required Thematic Thread Coursework:		
MATH 230	Calculus II	4
PHYS 217	University Physics 2 with Lab	4
Subtotal		8
Total Hours		**41**

[1] 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	
Total Hours		**0-3**

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 Requirements

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

Code	Title	Hours
Required Engineering Courses		
ENGR 110	Introduction to Engineering [1]	2
ENGR 120	Engineering Design Tools [1]	2
ENGR 130	Engineering Computing Tools [1]	2
ENGR 210	Statics [1]	3
ENGR 220	Engineering Materials [1]	3
ENGR 310	Introduction to Electrical Engineering [1]	3
ENGR 340	Engineering Economics [1]	3
ISE 311	Introduction to Operations Research [1]	3
ISE 362	Lean Systems [1]	3
ISE 370	Design of Industrial Systems and Processes [1]	3
ISE 372	Manufacturing Systems Design and Analysis [1]	3
ISE 373	Quality Engineering [1]	3
ISE 402	Work Design [1]	3
ISE 410	Engineering Project Management [1]	3
ISE 420	Simulation of Industrial Systems [1]	4
ISE 421	Supply Chain & Logistics Engineering [1]	3
ISE 430	Production Planning & Control [1]	3
ISE 440	Health Care Systems Engineering [1]	3
ISE 442	Human Factors Engineering [1]	3
ISE 460	Engineering Risk Analysis [1]	3
ISE 487	Industrial and Systems Engineering Senior Project I [1]	1
ISE 488	Senior Project II [1]	3
MECH 330	Introduction to Mechatronics [1]	4
Subtotal		66
ISE Electives		
Select three of the following:		8
ISE 330	Six Sigma Methodology	
ISE 382	Sustainable Processes	
ISE 432	Productivity Analysis	
ISE 480	Industrial and Systems Engineering Undergraduate Research	
MATH 316	Advanced Methods of Operations Research	
Subtotal		8
Required Math and Science Courses		
MATH 231	Calculus III [1]	4
MATH 232	Linear Algebra [1]	3
STAT 350	Applied Statistics [1]	3
Subtotal		10
Total Hours		**84**

[1] Course counts for 50% of Major requirements and Major GPA

[2] Course can be counted as a Rock Studies 2 Requirement, but earns credit only once toward your 120-credits total.

* 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
Total Hours		**3**

Natural Science and Math College-Wide Requirements

Code	Title	Hours
CHEM 107	General Chemistry I [1]	3
CHEM 111	General Chemistry I Lab [1]	1
MATH 225	Calculus I [1]	4
PHYS 216	University Physics 1 with Lab	4
Total Hours		**12**

[1] 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

INDUSTRIAL AND SYSTEMS ENGINEERING - BS (6182)
This program is effective as of Summer 2021
Revised 3.31.2022
UCC 10.26.2021

Recommended Four-Year Plan

Course	Title	Hours
First Year		
Fall		
MATH 225	Calculus I	4
CHEM 107 & CHEM 111	General Chemistry I and General Chemistry I Lab	4
ENGR 110	Introduction to Engineering	2
ENGL 102	Critical Writing	3
ESAP 101	FYRST Seminar *	0-1
SUBJ 139	Foundations of Academic Discovery [1]	3
	Hours	**16-17**

Spring		
ENGR 120	Engineering Design Tools	2
ENGL 104	Critical Reading	3
MATH 230	Calculus II	4
PHYS 216	University Physics 1 with Lab	4
Social Science Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
	Hours	**16**
Second Year		
Fall		
ENGR 130	Engineering Computing Tools	2
ENGR 210	Statics	3
ENGR 340	Engineering Economics	3
MATH 231	Calculus III	4
PHYS 217	University Physics 2 with Lab	4
	Hours	**16**
Spring		
ENGR 310	Introduction to Electrical Engineering	3
ENGR 220	Engineering Materials	3
MATH 232	Linear Algebra	3
STAT 350	Applied Statistics	3
Select one of the following:		3
COMM 200	Civil Discourse: Theory & Practice	
PHIL 110	Ethics and Civil Discourse	
POLS 235	Civil Discourse and Democracy	
	Hours	**15**
Third Year		
Fall		
ISE 311	Introduction to Operations Research	3
ISE 372	Manufacturing Systems Design and Analysis	3
ISE 373	Quality Engineering	3
ISE 402	Work Design	3
MECH 330	Introduction to Mechatronics	4
	Hours	**16**
Spring		
ISE 370	Design of Industrial Systems and Processes	3
ISE 420	Simulation of Industrial Systems	4
ISE 421	Supply Chain & Logistics Engineering	3
ISE 430	Production Planning & Control	3
ISE 440	Health Care Systems Engineering	3
	Hours	**16**
Fourth Year		
Fall		
ISE 442	Human Factors Engineering	3
ISE 410	Engineering Project Management	3
ISE 487	Industrial and Systems Engineering Senior Project I	1
ISE Elective		3
Creative & Aesthetic Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
Humanities Inquiry (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/)		3
	Hours	**16**
Spring		
ISE 362	Lean Systems	3
ISE 488	Senior Project II	3
ISE Elective		5
ISE 460	Engineering Risk Analysis	3
Free Elective		3
	Hours	**17**
	Total Hours**	**128**

[1] 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: 6182
Revised: 07.27.2023