

# PHYSICS, BACHELOR OF ARTS (BA) / PRE-ENGINEERING (YSU) (3+2)

## Program Learning Outcomes

Upon graduation, students in the Physics Program at SRU will be:

- Proficient in the basic and advanced concepts of classical and modern physics.
- Accomplished problem solvers capable of applying inductive and deductive logic, mathematical modeling, computational tools, and principles of physics to novel situations.
- Skilled at constructing and assembling experimental apparatuses, conducting and analyzing measurements of physical phenomena, and drawing valid conclusions from experimental data.
- Effective communicators, capable of presenting scientific results effectively to diverse audiences.
- Prepared for a career in science, industry, and education or to pursue a graduate program in physics or related areas.

## Related Links

Physics - Pre-Engineering YSU, BA Program Page (<https://www.sru.edu/academics/majors-and-minors/pre-engineering-with-ysu/>)

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

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

## Curriculum Guide

### GPA Requirement

Major GPA: 2.00 or higher  
Overall GPA: 2.75 or higher

### Summary\*

Code	Title	Hours
	Rock Studies 2 Requirements	41
	Modern Language Requirements	Waived
	Other Basic Requirements	0-3
	Computer Competency	0-3
	Major Requirements	58
	Natural Science and Math College-Wide Requirements	12
	Electives	21

\* 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

### Integrated Inquiry

<i>Creative and Aesthetic Inquiry</i>		
Select 3 Credits ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/</a> )		3

<i>Humanities Inquiry</i>		
Select 3 Credits ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/</a> )		3

<i>Social Science Inquiry</i>		
Select 3 Credits ( <a href="https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-quick-guide/">https://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

### Additional Rock Studies 2 Requirements

Required Thematic Thread Coursework:		
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.

### BA Modern Language Requirement

BA degree requires language proficiency at the 103 class level. Exemption by placement or examination is possible.

Code	Title	Hours
This Requirement is Waived.		
<b>Total Hours</b>		<b>0</b>

### 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>

## 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	
<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 Requirements

Code	Title	Hours
<b>Required Physics Courses</b>		
PHYS 140	Engineering Graphics I <sup>1</sup>	2
PHYS 141	Engineering Graphics II <sup>1</sup>	1
PHYS 211	General Physics I with Lab <sup>1</sup>	4
PHYS 212	General Physics II with Lab <sup>1</sup>	3
PHYS 213	General Physics III/ Lab <sup>1</sup>	4
PHYS 314	Statics <sup>1</sup>	3
PHYS 331	Mathematical Methods of Physics <sup>1</sup>	3
or MATH 331	Mathematical Methods of Physics	
Subtotal		20

### Major and Related Electives

Select nine credits of the following: <sup>2</sup>		9
PHYS 315	Dynamics <sup>1</sup>	
PHYS 371	Physical Optics <sup>1</sup>	
PHYS 375	Thermal Physics <sup>1</sup>	
PHYS 381	Advanced Physics Laboratory <sup>1</sup>	
PHYS 382	Optics Laboratory <sup>1</sup>	
PHYS 385	Computational Physics <sup>1</sup>	
PHYS 410	Electricity and Magnetism <sup>1</sup>	
PHYS 480	Quantum <sup>1</sup>	
CHEM 201	Organic Chemistry I <sup>1</sup>	
CHEM 202	Organic Chemistry II <sup>1</sup>	
CHEM 211	Organic Chemistry Laboratory I <sup>1</sup>	
CHEM 212	Organic Chemistry Laboratory II <sup>1</sup>	
CHEM 301	Physical Chemistry I <sup>1</sup>	
or PHYS 301	Physical Chemistry I	
EGEO 101	Physical Geology <sup>1</sup>	
EGEO 202	Earth History/Lab <sup>1</sup>	
EGEO 111	Physical Geology Lab <sup>1</sup>	
EGEO 201	Earth Materials and Processes/Lab <sup>1</sup>	
EGEO 327	Structural Geology <sup>1</sup>	
EGEO 360	Introduction to Hydrology/Lab <sup>1</sup>	

CPSC 236	Selected Computer Languages <sup>1</sup>	
CPSC 246	Advanced Programming Principles <sup>1</sup>	
CPSC 370	Computer Organization and Architecture <sup>1</sup>	
MATH 315	Numerical Mathematics <sup>1</sup>	
STAT 352	Mathematical Statistics I <sup>1</sup>	
Subtotal		9

### Required Related Courses

CHEM 107	General Chemistry I <sup>1,3</sup>	3
CHEM 108	General Chemistry II <sup>1,3</sup>	3
CHEM 111	General Chemistry I Lab <sup>1,3</sup>	1
CHEM 112	General Chemistry II Lab <sup>1,3</sup>	1
CPSC 140	Introduction to Programming Principles <sup>1,3</sup>	3
MATH 225	Calculus I <sup>1</sup>	4
MATH 230	Calculus II <sup>1</sup>	4
MATH 231	Calculus III <sup>1</sup>	4
MATH 240	Linear Algebra and Differential Equations <sup>1</sup>	3
MATH 301	Differential Equations I <sup>1</sup>	3
Subtotal		29

**Total Hours** **58**

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

<sup>2</sup> Elective courses need to be selected based upon area of Engineering chosen. Please contact your Adviser for specific courses

<sup>3</sup> 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.

## Natural Science and Math College-Wide Requirements

Code	Title	Hours
Students must take the following four courses:		
CHEM 107	General Chemistry I <sup>1</sup>	3
CHEM 111	General Chemistry I Lab <sup>1</sup>	1
Select one of the following:		4
MATH 125	Precalculus <sup>1</sup>	
MATH 225	Calculus I <sup>1</sup>	
PHYS 201	Elements of Physics I with Lab	4
or PHYS 211	General Physics I with Lab	
<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

PHYSICS PRE ENGINEERING - BA (6 64)  
with Youngstown State University (6 67)  
This program is effective as of Fall 2019.  
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