

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 Fact Sheet URL (<https://www.sru.edu/documents/programs/factsheets/undergraduate/physics-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: 2.75 or higher

Summary*

| Code | Title | Hours |
|------|--|--------|
| | Rock Studies 2 Requirements | 41 |
| | Modern Language Requirements | Waived |
| | Other Basic Requirements | 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 |
|-----------------|--|-------|
| 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 | | |
| <i>Creative and Aesthetic Inquiry</i> | | |
| Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/) | | 3 |
| <i>Humanities Inquiry</i> | | |
| Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/) | | 3 |
| <i>Social Science Inquiry</i> | | |
| Select 3 Credits (https://catalog.sru.edu/undergraduate/rock-studies/rock-studies-program/) | | 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 |

¹ 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. | | |
| Total Hours | | 0 |

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

| Code | Title | Hours |
|--|--|-------|
| Required Physics Courses | | |
| PHYS 140 | Engineering Graphics I ¹ | 2 |
| PHYS 141 | Engineering Graphics II ¹ | 1 |
| PHYS 211 | General Physics I with Lab ¹ | 4 |
| PHYS 212 | General Physics II with Lab ¹ | 3 |
| PHYS 213 | General Physics III/ Lab ¹ | 4 |
| PHYS 314 | Statics ¹ | 3 |
| PHYS 331 | Mathematical Methods of Physics ¹ | 3 |
| or MATH 331 | Mathematical Methods of Physics | |
| Subtotal | | 20 |
| Major and Related Electives | | |
| Select nine credits of the following: ² | | 9 |
| PHYS 315 | Dynamics ¹ | |
| PHYS 371 | Physical Optics ¹ | |
| PHYS 375 | Thermal Physics ¹ | |
| PHYS 381 | Advanced Physics Laboratory ¹ | |
| PHYS 382 | Optics Laboratory ¹ | |
| PHYS 385 | Computational Physics ¹ | |
| PHYS 410 | Electricity and Magnetism ¹ | |
| PHYS 480 | Quantum ¹ | |
| CHEM 201 | Organic Chemistry I ¹ | |
| CHEM 202 | Organic Chemistry II ¹ | |
| CHEM 211 | Organic Chemistry Laboratory I ¹ | |
| CHEM 212 | Organic Chemistry Laboratory II ¹ | |
| CHEM 301 | Physical Chemistry I ¹ | |
| or PHYS 301 | Physical Chemistry I | |
| EGEO 101 | Physical Geology ¹ | |
| EGEO 202 | Earth History/Lab ¹ | |
| EGEO 111 | Physical Geology Lab ¹ | |
| EGEO 201 | Earth Materials and Processes/Lab ¹ | |
| EGEO 327 | Structural Geology ¹ | |
| EGEO 360 | Introduction to Hydrology/Lab ¹ | |
| CPSC 236 | Selected Computer Languages ¹ | |
| CPSC 246 | Advanced Programming Principles ¹ | |
| CPSC 370 | Computer Organization and Architecture ¹ | |
| MATH 315 | Numerical Mathematics ¹ | |
| STAT 352 | Mathematical Statistics I ¹ | |
| Subtotal | | 9 |
| Required Related Courses | | |
| CHEM 107 | General Chemistry I ^{1,3} | 3 |
| CHEM 108 | General Chemistry II ^{1,3} | 3 |
| CHEM 111 | General Chemistry I Lab ^{1,3} | 1 |
| CHEM 112 | General Chemistry II Lab ^{1,3} | 1 |
| CPSC 140 | Introduction to Programming Principles ^{1,3} | 3 |
| MATH 225 | Calculus I ¹ | 4 |
| MATH 230 | Calculus II ¹ | 4 |
| MATH 231 | Calculus III ¹ | 4 |
| MATH 240 | Linear Algebra and Differential Equations ¹ | 3 |

| | | |
|--------------------|---------------------------------------|-----------|
| MATH 301 | Differential Equations I ¹ | 3 |
| Subtotal | | 29 |
| Total Hours | | 58 |

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

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

³ 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 ¹ | 3 |
| CHEM 111 | General Chemistry I Lab ¹ | 1 |
| Select one of the following: | | 4 |
| MATH 125 | Precalculus ¹ | |
| MATH 225 | Calculus I ¹ | |
| PHYS 201 | Elements of Physics I with Lab | 4 |
| or PHYS 211 | General Physics I with Lab | |
| 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

PHYSICS PRE ENGINEERING - BA (6 64)
with Youngstown State University (6 67)
This program is effective as of Fall 2019.
Revised 07.29.2021
UCC 2.5.2019