

PHYSICS MAJOR (B.S.)

In addition to meeting the Core Curriculum requirements of the College of Arts and Sciences, each degree candidate must complete at least 68 hours (30 hours for Five-Year Dual Degree Physics/Engineering Program) of the following coursework for the first three years. Students must complete six credits at the 2000-level before taking any 3000-level courses.

Link to College Core requirement (<http://catalogue.shu.edu/undergraduate/college-arts-sciences/core-curriculum/>).

Code	Title	Hours
Physics Core Requirements		
PHYS 1705 & 1705	Principles of Physics I and Principles of Physics I	6
PHYS 1815 & PHYS 1816	Physics Lab and Data Analy I and Physics Lab and Data Analy II	3
PHYS 2112	Phys Appl of Math Techniques	4
PHYS 2185	Intro to Modern Physics	4
PHYS 2186	Waves and Oscillations	3
PHYS 2883	Electronics I	3
PHYS 3119	Math Methods of Physics I	4
PHYS 3121	Mechanics I	3
PHYS 3185	Electricity and Magnetism I	3
PHYS 3217	Modern Optics	3
Select one or two of the following:		6-12
PHYS 3812 & PHYS 3815	Advanced Laboratory I and Advanced Laboratory II	
PHYS 4812 & PHYS 4815	Advanced Laboratory III and Advanced Laboratory IV	
Other Required Courses		
Select one of the following:		4-5
CHEM 1107	Principles of Chemistry I	
CHEM 1123 & CHEM 1125	General Chemistry I and General Chemistry Lab I	
Select one of the following:		4
CHEM 1108	Principles of Chemistry II	
CHEM 1124 & CHEM 1126	General Chemistry II and General Chemistry II Lab	
MATH 1501 & MATH 1511 & MATH 2511	Calculus I - Math - Phys Sci and Calculus II - Math - Phys Sci and Calculus III - Math - Phys Sci	12
CSAS 1113	Computing for Science Majors	4
Subtotal		66-73
Select 12 credits of electives if pursuing graduate work: *		12
CHEM 3411	Physical Chemistry I	
PHYS 3122	Mechanics II	
PHYS 3186	Electricity and Magnetism II	
PHYS 4211 & PHYS 4212	Quantum Mechanics I and Quantum Mechanics II	
PHYS 4219	Statistical Physics	
Subtotal		12
Requirements for those pursuing industrial employment:		
CHEM 2215	Analytical Chemistry I	4

PHYS 3894	Physics Internship I	3
Subtotal		7
Total Hours		85-92

* Take a minimum of 12 elective credits from the following list. Students should select courses in consultation with their departmental adviser.

Model Program for B.S. (Physics, Physics/Engineering) and for B.A. Physics

Course	Title	Hours
First Year		
First Semester		
PHYS 1705	Principles of Physics I	3
PHYS 1815	Physics Lab and Data Analy I	2
ENGL 1201	Core English I	3
MATH 1501	Calculus I - Math - Phys Sci	4
Hours		12
Second Semester		
PHYS 1706	Principles of Physics II	3
PHYS 1816	Physics Lab and Data Analy II	1
ENGL 1202	Core English II	3
MATH 1511	Calculus II - Math - Phys Sci	4
Hours		11
Second Year		
First Semester		
PHYS 2185	Intro to Modern Physics	4
PHYS 2883	Electronics I	3
MATH 2511	Calculus III - Math - Phys Sci	4
Select one of the following: *		4
CHEM 1107	Principles of Chemistry I	
CHEM 1123 & CHEM 1125	General Chemistry I and General Chemistry Lab I	
Hours		15
Second Semester		
PHYS 2112	Phys Appl of Math Techniques	4
PHYS 2186	Waves and Oscillations	3
Select one of the following: **		4-5
CHEM 1108	Principles of Chemistry II	
CHEM 1124 & CHEM 1126	General Chemistry II and General Chemistry II Lab	
Hours		11-12
Third Year		
First Semester		
PHYS 3119	Math Methods of Physics I	4
PHYS 3121	Mechanics I	3
PHYS 3185	Electricity and Magnetism I	3
PHYS 3815	Advanced Laboratory II	2
Hours		12
Second Semester		
PHYS 3122	Mechanics II	3
PHYS 3217	Modern Optics	3
PHYS 3812	Advanced Laboratory I	2
PHYS 4211	Quantum Mechanics I	3
Elective Courses (see below)		3
Hours		14
Fourth Year		
First Semester		
PHYS 4812	Advanced Laboratory III	2

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Elective courses (see below)	3
Hours	5
Second Semester	
PHYS 4815 Advanced Laboratory IV	2
Elective courses (see below)	3
Hours	5
Total Hours	85-86

* B.A. students must take CHEM 1107 Principles of Chemistry I.

**B.A. students must take CHEM 1108 Principles of Chemistry II.

The following electives are recommended:

Code	Title	Hours
BIOL 1211	General Biology- Organisms	3
BIOL 1222	General Biology-Cell	3
CHEM 2321	Organic Chemistry I	3
CHEM 2315	Organic Chemistry I-Lab	1
CHEM 2322	Organic Chemistry II	3
CHEM 2316	Organic Chemistry II-Lab	1
CSAS 1113	Computing for Science Majors	4
ENGL 3514	Scientific and Technical Writing	3
MATH 2111	Statistics for Science Majors *	4
PHIL 2700	Philosophy of Science	3
PHYS 3186	Electricity and Magnetism II	3
PHYS 4211	Quantum Mechanics I	3
PHYS 4212	Quantum Mechanics II	3
PHYS 4219	Statistical Physics	3
PHYS 4290	Research in Physics I	2

* Prerequisite: MATH 1401 Calculus I