

PHYSICS (B.S.)

Bachelor of Science Program

Program Code: BS-AS

Major Code: PHY

Physics Department

SAMC 162

(716) 878-6726

physics.buffalostate.edu/ (<https://physics.buffalostate.edu/>)

The physics B.S. program gives a broad background in the fundamental concepts and applications of physics. This background is appropriate for further study in graduate school, or for scientific employment in physics or physics-related fields.

Students in this program may pursue a four-year physics degree or they may choose the "three-two" option.

Transfer students must take a minimum of 8 credit hours of upper-division courses, including PHY 410, in the Buffalo State Physics Department.

"Three-Two" Physics Engineering Option

This program offers an ideal combination of basic and applied science. Students in the Cooperative ("Three-Two") Physics-Engineering program attend Buffalo State for three years pursuing a liberal arts curriculum in physics. After three years, students in good standing transfer to the engineering school of their choice and complete the requirements for an engineering degree in two more years. Engineering schools to which students in the program have transferred in the last two years include Binghamton University and the University at Buffalo (both SUNY universities), and Clarkson University.

Admission Requirements

Mathematics preparation through precalculus is required.

Program Requirements

Code	Title	Credit Hours
General Education 23 Requirements (http://ecatalog.buffalostate.edu/undergraduate/collegewide-degree-requirements-baccalaureate-degrees/#IF_Courses)		
33 credit hours		33
Physics Major Requirements (44 credit hours)		
<i>Required Core Courses (26 credit hours)</i>		
PHY 111	UNIVERSITY PHYSICS I	5
PHY 112	UNIVERSITY PHYSICS II	5
PHY 213	UNIVERSITY PHYSICS III	3

PHY 214	OPTICS AND HEAT LABORATORY	1
PHY 305	MODERN PHYSICS I	3
PHY 306	MODERN PHYSICS II	3
PHY 310	COMPUTATIONAL PHYSICS LABORATORY	3
PHY 320	INTRODUCTION TO THEORETICAL PHYSICS	3
<i>Additional Required Courses for the "Three-Two" Option (9 credit hours)</i>		
PHY 324	ELECTRIC CIRCUIT ANALYSIS	3
PHY 410	ADVANCED PHYSICS LABORATORY	3
PHY 440	ELECTRICITY AND MAGNETISM I	3
Plus 10 credit hours of engineering courses, transferred from engineering school		10
<i>Additional Required Courses for Four-Year Physics B.S.-Only Degree (18 credit hours)</i>		
PHY 324	ELECTRIC CIRCUIT ANALYSIS	3
PHY 410	ADVANCED PHYSICS LABORATORY	3
PHY 425	CLASSICAL MECHANICS	3
PHY 435	INTRODUCTION TO QUANTUM MECHANICS	3
PHY 440	ELECTRICITY AND MAGNETISM I	3
PHY 441	ELECTRICITY AND MAGNETISM II	3
Required Credit Hours Outside the Major (26 credit hours)		
CHE 111	FUNDAMENTALS OF CHEMISTRY I	3
CHE 112	FUNDAMENTALS OF CHEMISTRY II	3
CHE 113	LABORATORY FOR FUNDAMENTALS OF CHEMISTRY I	1
CHE 114	LABORATORY FOR FUNDAMENTALS OF CHEMISTRY II	1
MAT 161	CALCULUS I	4
MAT 162	CALCULUS II	4
MAT 163	USING TECHNOLOGY TO EXPLORE CALCULUS I	1
MAT 164	USING TECHNOLOGY TO EXPLORE CALCULUS II	1

MAT 263	CALCULUS III	4
MAT 264	USING TECHNOLOGY TO EXPLORE CALCULUS III	1
MAT 315	DIFFERENTIAL EQUATIONS	3
All College Electives		
17 credit hours		17
Total Credit Hours		120

Students will demonstrate:

1. ability to communicate clearly using the vocabulary and concepts of physics.
2. ability to solve conceptual and quantitative problems in physics at an undergraduate level.
3. understanding of laboratory skills used in physics laboratory exercises.
4. ability to write algorithms in a computational language using common software.
5. an understanding of keeping an accurate and legible laboratory notebook.
6. ability to analyze and evaluate experimental data.
7. mastery of the subject matter in Classical Mechanics, Electricity & Magnetism, and Quantum Mechanics.
8. adequate technical report writing skills.
9. adequate oral presentation skills.