PHYSICS, BA

Directors of Undergraduate Studies

Joseph Paulsen
jdpaulse@syr.edu
201 Physics Building
315-443-3901

Faculty

Marina Artuso, Stefan Ballmer, Steven Blusk, Duncan Brown, Craig Cahillane, Simon Catterall, Eric Coughlin, Walter Freeman, Jay Hubisz, John Laiho, Colm Kelleher, Alex Maloney, M. Lisa Manning, Georgia Mansell, Alan Middleton, Liviu Movileanu, Alexander Nitz, Nidhi Pashine, Alison Patteson, Joseph Paulsen, Ivan Pechenezhskiy, Britton Plourde, Jennifer Ross, Matthew Rudolph, Christian Santangelo, Jennifer Schwarz, Rafael Silva Coutinho, Mirna Mihovilovic Skanata, Tomasz Skwarnicki, Mitchell Soderberg, Paul Souder, Scott Watson, Denver Whittington

Program Description

Physicists idealize the behavior of matter and energy in terms of mathematical representations called the "fundamental laws of nature" and seek to explain the properties of nuclei, atoms, molecules, and systems of these particles (gases, liquids, crystals, etc.). Undergraduate courses provide a background in classical physics, quantum mechanics, and laboratory techniques.

The department offers coursework leading to either a B.A. or a B.S. degree. The B.A. degree program is an excellent liberal arts major that requires fewer credit hours in the major than the B.S. program. The Physics B.A. provides a flexible and broad education in many topics in physics that prepare students for a diverse array of STEM or STEM-adjacent career options.

Other information about physics be found at physics.syr.edu.

Student Learning Outcomes

1. A student will be able to explain phenomena occurring from sub-atomic to cosmological distance scales using qualitative physical principles.
2. A student will be able to apply mathematics and logic to solve problems associated with natural phenomena.
3. A student will be able to assess and explain arguments for physical laws based on experimental and theoretical evidence.
4. A student will be able to employ basic laboratory and technical skills to solve physics problems as a result of formal laboratory course work and research opportunities with faculty.

B.A. Degree Requirements

The B.A. degree in physics is an important accomplishment for students considering careers in such widely varying areas as law, journalism, corporate management, and teaching. In all of these fields a liberal education incorporating serious study of a scientific discipline is an asset.

- Development of analytical and computational skills through the study of advanced undergraduate physics.
- Development of written and verbal communication skills, including the specialized skills required for the communication of technical information.
- Development of a broad understanding of the role of science and technology in modern life. The bachelor of arts degree requires completion of at least 30 credits of physics and astronomy courses.

Code	Title	Credits
Lower-division Courses		
PHY 215 & PHY 225	General Physics I for Scientists and Experiencing Physics I	5
PHY 216 & PHY 226	General Physics II for Scientists and Experiencing Physics II	5
Note: Students declaring a Physics B.A. after having successfully completed PHY 211, PHY 221, PHY 212, and PHY 222 are not required to take PHY 215, PHY 225, PHY 216, and PHY 226 but will need to earn at least 2 additional credits in any PHY or AST courses with the approval of the Physics Director of Undergraduate Studies.		
Upper-division Physics and Astronomy Courses		
Select one of the following:		3
PHY 315	Biological and Medical Physics	
PHY 316	Econophysics	
PHY 317	Modern Astrophysics	
PHY 319	Introduction to Astrobiology	
PHY 360	Vibrations, Waves and Thermal Physics	
Select one of the following:		3
PHY 306	Nuclear Physics in our Lives	
PHY 314	Quantum Computing Demystified	
PHY 361	Statistical Physics and Quantum Phenomena	
PHY 443 or PHY 365	Experimental Physics Experiencing Physics III	
PHY 366	Experiencing Physics IV	
The remaining 8 credits must be completed with PHY courses numbered 300 or above including those listed above not already completed.		8
Total Credits		**24**

College of Arts and Sciences Requirements
For all Arts and Sciences|Maxwell students, successful completion of a bachelor's degree in this major requires a minimum of 120 credits, 96 of which must be Arts and Sciences|Maxwell credits, completion of the Liberal Arts Core (https://coursecatalog.syracuse.edu/undergraduate/arts-sciences/#text) requirements, and the requirements for this major (30 credits) that are listed above.

Dual Enrollments:
Students dually enrolled in **Newhouse*** and Arts and Sciences|Maxwell will complete a minimum of 122 credits, with at least 90 credits in Arts and Sciences|Maxwell coursework and an Arts and Sciences|Maxwell major.

*Students dually enrolled in the College of Arts and Sciences|Maxwell as first year students must complete the Liberal Arts Core (https://coursecatalog.syracuse.edu/undergraduate/arts-sciences/#text). Students who transfer to the dual program after their first year as singly enrolled students in the Newhouse School will satisfy general requirements for the dual degree program by completing the Newhouse Core Requirements.

Undergraduate University Requirements
The following requirements and experiences apply to all Syracuse University Undergraduate matriculated degree programs.

- IDEA Course Requirement (https://coursecatalog.syracuse.edu/undergraduate/idea-course-requirement/)
- First Year Seminar (https://coursecatalog.syracuse.edu/undergraduate/courses/fys/)