PHYSICS (B.S.)

The Bachelor of Science program offers several options. Each option is designed to meet the needs of a particular group of students although each is flexible enough to avoid limiting the student to a particular future program. Students take a logically-developed sequence of physics courses on a broad range of topics. The introductory sequence uses calculus, and later courses investigate single areas in greater depth, using more advanced mathematics. In advanced laboratory courses the physics student uses sophisticated equipment and sometimes has an opportunity to join a research team.

Admission Requirements

Admission requirements for this program are satisfied by the general requirements for undergraduate admission (https://bulletins.wayne.edu/undergraduate/general-information/admission/) to the University.

Program Requirements

Candidates must complete 120 credits in course work including satisfaction of the University General Education Requirements (https://bulletins.wayne.edu/undergraduate/general-information/general-education/) and the College of Liberal Arts and Sciences Group Requirements (https://bulletins.wayne.edu/undergraduate/college-liberal-arts-sciences/bachelors-degree-requirements/), as well as the Departmental major requirements cited below. All course work must be completed in accordance with the regulations of the University (https://bulletins.wayne.edu/undergraduate/general-information/academic-regulations/) and the College (https://bulletins.wayne.edu/undergraduate/college-liberal-arts-sciences/academic-regulations/) governing undergraduate scholarship and degrees.

Students must receive a grade of C- or better in all physics and/or astronomy courses, and a minimum grade of C- is required in prerequisite courses. A cumulative grade point average of 2.0 or higher for all course work is required for graduation.

Basic Requirements for All Options

Code	Title	Credits
PHY 2170 & PHY 2171	University Physics I for Scientists and Engineers and University Physics I Experimental Laboratory	5
PHY 2180 & PHY 2181	University Physics II for Scientists and Engineers and University Physics II Experimental Laboratory	5
PHY 3300 & PHY 3310	Introductory Modern Physics and Introductory Modern Physics Laboratory	5
PHY 3500	Introduction to Thermal and Fluid Physics	3
PHY 3750	Introduction to Computational Methods	1
PHY 5200	Classical Mechanics I	4
MAT 2010	Calculus I	4
MAT 2020	Calculus II	4
MAT 2030	Calculus III	4
MAT 2150	Differential Equations and Matrix Algebra	4
CHM 1100 & CHM 1130	General Chemistry I and General Chemistry I Laboratory	5
Total Credits		**44**

Advanced Physics Option

This option is primarily for students who intend to go on to graduate study in physics. It also satisfies the requirements of industrial and governmental employers who demand a traditional education in physics.

Additional requirements beyond the Basic Requirements listed above:

Code	Title	Credits
PHY 6400	Quantum Physics I	4
PHY 6500	Thermodynamics and Statistical Physics	3
PHY 6600	Electromagnetic Fields I	4
PHY 6850	Advanced Physics Laboratory	3
PHY 6860	Computational Physics	3
Select one of the following:		5
PHY 5340 & PHY 5341	Optics and Optics Laboratory	
PHY 5620 & PHY 5621	Electronics and Electrical Measurements and Electronics and Electrical Measurements Laboratory	
Select two of the following:		6
PHY 6260	Survey of Elementary Particle Physics	
PHY 6270	Survey of Nuclear Physics	
PHY 6290	Survey of Biophysics	
Total Credits		**28**

Engineering and Applied Physics Option

The B.S. degree in the Engineering and Applied Physics option is intended to provide the interdisciplinary training that is required for a variety of applied fields, while still providing an understanding of the physical foundations of those fields. Programs are designed to combine fundamental physics courses with engineering and other science courses, in order to prepare students for careers in industry (particularly engineering fields) as well as graduate programs in these areas. There is sufficient flexibility in this program that a set of courses can be designed to match a student's interest in such areas as semiconductor physics, material physics, computational physics, biophysics, optics and laser physics, and other areas. Students interested in enriching their education with on-the-job experience may apply for internships with cooperating research laboratories by contacting the departmental undergraduate advisor.

Additional requirements beyond the Basic Requirements listed above:

Code	Title	Credits
PHY 6600	Electromagnetic Fields I	4
PHY 5340 & PHY 5341	Optics and Optics Laboratory	5
PHY 5620 & PHY 5621	Electronics and Electrical Measurements and Electronics and Electrical Measurements Laboratory	5
PHY 6850	Advanced Physics Laboratory	3
Select one of the following:		2-3
PHY 6750	Applied Computational Methods	
PHY 6860	Computational Physics	
Select one of the following:		3-4
PHY 6400	Quantum Physics I	
PHY 6500	Thermodynamics and Statistical Physics	
Select one of the following:		3
PHY 6260	Survey of Elementary Particle Physics	
PHY 6270	Survey of Nuclear Physics	
PHY 6290	Survey of Biophysics	
Total Credits		**25-27**

Physics and Biomedical Physics Honors Program

Undergraduate majors, in both Physics and Biomedical Physics, with a minimum grade point average of 3.3 can enroll in the Honors program of the Department of Physics and Astronomy. Prospective students should consult the departmental Undergraduate Academic Advisor as soon as they declare their major to learn about specific requirements.

Physics AGRADE Program

Seniors in Physics and Astronomy, with a minimum grade point average of 3.5, may enroll simultaneously in the undergraduate and graduate programs. These students can apply up to fifteen credits towards both the bachelors and masters degrees in physics. Contact Undergraduate Academic Advisor for further information.

Interdisciplinary Physics-ECE AGRADE Program

Outstanding seniors in Physics (both Engineering and Applied Physics option and Advanced Physics option), who have completed at least 90 credits and have an overall GPA of at least 3.5, and major physics classes GPA at least 3.6, can apply to enter the cross-college AGRADE program between the Physics undergraduate program (College of Liberals Arts and Sciences) and Electrical Engineering (EE) Master's programs (James and Patricia Anderson College of Engineering). The AGRADE program allows students to apply up to 12 credits of selected graduate courses, taken as an undergraduate, towards a Master's degree in Electrical Engineering. The Physics courses that can be counted towards MS-EE degree include PHY 5340/PHY 5341, PHY 5620/PHY 5621, and PHY 5100. This enables students to complete an undergraduate degree in Physics and a graduate degree in Electrical Engineering in just 5 years of full-time study. For more details, please contact the undergraduate Physics advisor in the Department of Physics and Astronomy, or the graduate advisor in the Department of Electrical and Computer Engineering.