PHYSICS (BS IN PHYSICS)

Program

Traditionally, many physics undergraduates continue in graduate school in pursuit of Ph.D. degrees in physics or engineering. Previous students who have completed a physics major also enter a variety of other fields, including among many others, archaeology, astronomy and astrophysics, biology, mathematics, computer science, high school teaching, law, medicine, environmental sciences, operations research, technical sales, industrial management, engineering and oceanography. Because physicists are scientific generalists, undergraduate work in physics followed by specialization in other areas has become one of the preferred preparations for many activities that are setting new directions in society. The requirements for major in physics are relatively flexible, and are designed to prepare people for either graduate work in physics or for later specialization in other areas.

Information on the program can be obtained through the World Wide Web at the address https://www.wm.edu/physics.

Graduate Program

The department offers the degrees of Master of Science and Doctor of Philosophy. Degree requirements and a full description of graduate courses in physics can be obtained through the World Wide Web at https://www.wm.edu/physics or you may request application forms by e-mail at grad@physics.wm.edu or by writing to the Chair of the Graduate Admission Committee in Physics.

Required Credit Hours: 34

(Honors and the Premed track have additional requirements. See below.)

Course Requirements

Core Requirements

Students completing a major in physics must take the following courses. Substitutions for these requirements must be approved by the departmental undergraduate committee and the chair. The requirement of senior project or Honors insures that all majors will engage in independent research during the senior year. Because of the extensive facilities available through the graduate program of the department, the senior projects generally deal with problems at the frontiers of physics. It is only through being actively involved in such pursuits that a student can appreciate the nature of the discipline.

Code	Title	Hours
Core Requirements		
PHYS 101	General Physics-Lecture	3
or PHYS 101H	General Physics I - Honors	
PHYS 101L	General Physics-Lab	1
PHYS 102	Gen Physics-Lecture	3
or PHYS 102H	General Physics II - Honors	
PHYS 102L	General Physics-Lab	1
PHYS 201	Modern Physics	4
PHYS 208	Classical Mechanics of Particles and Waves I	4
PHYS 251	Experimental Atomic Physics	3
PHYS 252	Electronics	3
PHYS 313	Quantum Mechanics I	3
PHYS 401	Electricity & Magnetism I	3
Select two of the following:		6
PHYS 303	Classical Mechanics of Particles and Waves II	
PHYS 314	Quantum Mechanics II	
PHYS 402	Electricity & Magnetism II	
PHYS 403	Statistical Mechanics and Thermodynamics	
Additional Requirements		**1-6**
PHYS 451	Physics Research	
PHYS 452	Physics Research	
or PHYS 495	Honors	
PHYS 496	Honors	
Total Hours		**35-40**

Major Computing Requirements

The departmental computer proficiency requirement is satisfied through the completion of course work demonstrating programming ability. This is typically satisfied by completion of PHYS 256 Practical Computing for Scientists and Engineers. Students may petition the Physics Undergraduate Committee to satisfy the requirement by another course or a senior/honors research project that demonstrates computational proficiency.

Major Writing Requirements

Code	Title	Hours
PHYS 451	Physics Research	1-3
PHYS 452	Physics Research	1-3
or PHYS 495	Honors	
PHYS 496	Honors	3

Additional Information

Students who plan to attend graduate school in physics should take all of the courses listed above including the courses below. To prepare for some engineering or professional programs it may be appropriate to substitute courses or elect additional courses.

Suitable mathematics courses should also be taken, including the MATH courses listed below.

Code	Title	Hours
PHYS 256	Practical Computing for Scientists and Engineers	3
PHYS 254	Introduction to Mathematical Physics	3
PHYS 303	Classical Mechanics of Particles and Waves II	3
PHYS 314	Quantum Mechanics II	3
PHYS 402	Electricity & Magnetism II	3
PHYS 403	Statistical Mechanics and Thermodynamics	3
PHYS 351	Scientific Instrumentation Laboratory	3
PHYS 352	Experimental Modern Physics	2
MATH 109	Linear Algebra	3
MATH 111	Calculus I	4
MATH 112	Calculus II	4
MATH 212	Introduction to Multivariable Calculus	3
MATH 213	Multivariable Calculus for Science and Mathematics	4
MATH 302	Ordinary Differential Equations	3
Total Hours		**44**