

PHYSICS (BA)

Program Mission

The mission of the Physics Program is to foster curiosity about the laws governing the physical world, enlighten students in critical thinking, and instruct them on applying the scientific method. Graduates of the program are prepared for careers in physics and physics-related fields, or the pursuit of advanced degrees. Graduates can pursue advanced degrees in diverse fields, including physics, medicine, teaching, engineering, or law.

Program Outcomes

1. Graduates will have conceptual knowledge of physics within the framework of a liberal arts education.
2. Graduates will be proficient in fundamental laboratory skills, including data analysis, and the use of instrumentation.
3. Graduates will be able to access, interpret, and utilize scientific materials as well as clearly and concisely communicate scientific results via oral and written reports.
4. Graduates will have the tools to succeed in a career in a physics-related fields, graduate studies in physics, teaching, or the pursuit of advanced degrees in medicine, teaching, or the law.
5. Graduates will have the interpersonal and professional skills to effectively work within teams and be project leader of teams of varied cultural and experiential backgrounds regardless of cultural differences.

Guidelines for Acceptance to a Physics & Astronomy Department Major

In order to ensure that students are on a successful academic trajectory, it is recommended that students who have not earned at least a C average in both PHYS-2100 Classical Physics I, Classical Physics I, and PHYS-2110 Classical Physics II, Classical Physics II, should not declare a major in the Physics & Astronomy Department. Students who have not achieved this minimum grade guideline but who still seek acceptance to a major in the Physics & Astronomy Department must meet with and receive approval from the Department Chair.

Program Requirements

Code	Title	Hours
Requirements (35-36 hours)		
PHYS-2100 & PHYS-2101	Classical Physics I and Classical Physics I Lab	4
PHYS-2110 & PHYS-2111	Classical Physics II and Classical Physics II Lab	4
PHYS-3200	Relativity & Atomic Physics	3
PHYS-3201	Modern Physics Lab	1
PHYS-3210	Nuclear & Elementary Particle Physics	2
PHYS-3211	Modern Physics Lab II	1
PHYS-4100 or ENGR-2310	Mechanics I Dynamics	3
PHYS-3500	Electronics	4
PHYS-4600	Electricity & Magnetism I	3
PHYS-4300 & PHYS-4301	Optics and Optics Laboratory	4
PHYS-COMP	Senior Comprehensive Exam	0

PHYS-4900	Physics Colloquium	0
PHYS-4901	Physics Colloquium	0
PHYS-4902	Physics Colloquium	0
PHYS-4903	Physics Colloquium	0
Two additional upper-division courses in physics or astronomy		6-7
Required Supporting Courses (25-27 hours)		
CHEM-1200	General Chemistry I Lecture	3
CHEM-1210	General Chemistry II Lecture	3
CHEM-1201	General Chemistry I Laboratory	1
CHEM-1211	General Chemistry II Lab	1
Select one of the following:		2-4
CSCI-2300	Programming for Scientists & Engineers	
CSCI-1140	Introduction to Computer Science I	
ENGR-2000	Computer Applications in Engineering	
MATH-1300	Calculus I	4
MATH-1350	Calculus II	4
MATH-2300	Calculus III	4
MATH-3100	Differential Equations	3
Recommended Supporting Courses		
MATH-2500	Linear Algebra	
MATH-2550	Discrete Mathematical Structures I	
MATH-3300	Numerical Computation	
Total Hours		60-63

Suggested Sequence of Courses for a Bachelor of Science or a Bachelor of Arts Degree in Physics

Course	Title	Hours
Freshman Year		
First Semester		
Complete the Classical Physics I sequence: ¹		4
PHYS-2100	Classical Physics I	
PHYS-2101	Classical Physics I Lab	
CHEM-1200	General Chemistry I Lecture	3
CHEM-1201	General Chemistry I Laboratory	1
Foreign Language		4
GNST-1000	BC Experience	1
MATH-1300	Calculus I	4
Hours		17
Second Semester		
Foreign Language		4
PHYS-2110 & PHYS-2111	Classical Physics II and Classical Physics II Lab	4
CHEM-1210	General Chemistry II Lecture	3
CHEM-1211	General Chemistry II Lab	1
MATH-1350	Calculus II	4
EXSC-1115	Wellness for Life	1
Hours		17
Sophomore Year		
First Semester		
PHYS-3200	Relativity & Atomic Physics	3

PHYS-3201	Modern Physics Lab	1
MATH-2300	Calculus III	4
PHIL-1750	Principles of Nature	3
THEO-1100	Introduction to Theology	3
Oral Communication		3

Hours **17**

Second Semester

PHYS-3210	Nuclear & Elementary Particle Physics	2
PHYS-3211	Modern Physics Lab II	1
MATH-3100	Differential Equations	3
CSCI-2300	Programming for Scientists & Engineers	3
PHYS-3500	Electronics	4
Historical Inquiry Foundation		3

Hours **16**

Junior Year**First Semester**

ENGL-1010	English Composition	3
Faith Foundation		3
PHYS-4100	Mechanics I	3
PHYS-4900	Physics Colloquium	0
Elective ²		3
Historical Inquiry Foundation		3

Hours **15**

Second Semester

Philosophical Inquiry Foundation		3
PHYS-4300	Optics	3
PHYS-4301	Optics Laboratory	1
PHYS-4110	Mechanics II ³	3
PHYS-4901	Physics Colloquium	0
EXSC Fitness Course		1
Visual Communication		3
Aesthetic Experience		3

Hours **17**

Senior Year**First Semester**

PHYS-4600	Electricity & Magnetism I	3
PHYS-4400	Thermodynamics ³	3
PHYS-4800	Quantum Mechanics ³	3
PHYS-4902	Physics Colloquium	0
Faith Foundation		3
Philosophical Inquiry Foundation		3

Hours **15**

Second Semester

PHYS-4610	Electricity & Magnetism II ³	3
PHYS-4903	Physics Colloquium	0
Person and Community Foundation		3
Aesthetic Experience		3
PHYS-4700	Condensed Matter Physics	3
Elective		3
PHYS-4910	Physics & Astronomy Research	1

PHYS-COMP	Senior Comprehensive Exam	0
Hours		16
Total Hours		130

¹ Students not ready for Calculus I this semester should enroll in a general education class instead of Classical Physics.

² Rec. PHYS-4200 Mathematical Methods for Physics

³ Indicates a course not required for the B.A.