

Physics, Radiation Physics (BSPHy)

All aspects of the physical universe are of interest to the physicist, who seeks to understand not only the smallest forms of matter and the rich phenomena present in our everyday lives but also the universe itself. Physics has played a critical role in human technological and intellectual development during the twentieth century. The tools of the physicist—observation, imagination, model building, prediction, and deduction—will enable physics to continue this influence into the new century. The Bachelor of Science in Physics degree program is designed to provide the skills, understanding, and outlook required for participation in the discovery of new knowledge about nature.

The Bachelor of Science in Physics program is balanced and broad. It is designed to give the student a strong foundation for graduate study or work in physics and, with additional training, for work in a variety of other areas, such as astronomy, astrophysics, biophysics, chemical physics, computer science, engineering, geophysics, mathematics, medicine, physics teaching, and space sciences. Students who end their formal training with the bachelor's degree may seek employment in industry, in national laboratories, or in teaching; they should consider the options in computation, radiation physics, space sciences, biophysics, and teaching, which augment the broad instruction provided by the basic Bachelor of Science in Physics.

This concentration is designed to provide the necessary foundation for the student who plans a career or further study in nuclear engineering, radiation engineering, or health physics.

Total Hours Required: 126

Plan of Study

The Plan of Study is a suggested four-year course sequence to support academic planning and serves as a helpful guide. Currently enrolled students should meet with their academic advisor to tailor their course selections and timelines to their individual goals and circumstances.

Course	Title	Hours
Year 1		
Semester 1		
M 408C	Differential and Integral Calculus	4
CH 301	Principles of Chemistry I	3
RHE 306	Rhetoric and Writing	3
<u>First-Year Signature Course (090)</u>		3
<u>American and Texas Government (070)</u>		3
Hours		16
Semester 2		
M 408D	Sequences, Series, and Multivariable Calculus	4
PHY 301	Mechanics	3
PHY 101L	Laboratory for Physics 301	1
CH 302	Principles of Chemistry II	3
<u>American and Texas Government (070)</u>		3
Free Elective		2
Hours		16
Year 2		
Semester 1		
M 427J	Differential Equations with Linear Algebra	4
PHY 316	Electricity and Magnetism	3
PHY 116L	Laboratory for Physics 316	1
Hours chosen from: AST, BIO, or GEO		3
<u>Foreign Language other than English, Beginning Proficiency</u>		3

Free Elective		3
Hours		17
Semester 2		
M 427L	Advanced Calculus for Applications II	4
PHY 315	Wave Motion and Optics	3
PHY 115L	Laboratory for Physics 315	1
PHY 355	Modern Physics and Thermodynamics	3
<u>Foreign Language other than English, Beginning Proficiency</u>		3
Free Elective		3
Hours		17
Year 3		
Semester 1		
PHY 336K	Classical Dynamics	3
M E 336P	Concepts in Nuclear and Radiation Engineering	3
Hours chosen from: Upper-division Math		3
Hours chosen from: AST, BIO, or GEO		3
<u>Social and Behavioral Sciences (080)</u>		3
Hours		15
Semester 2		
PHY 353L	Modern Physics Laboratory	3
PHY 373	Quantum Physics I: Foundations	3
Hours chosen from: Upper-division Math		3
<u>U.S. History (060)</u>		3
<u>Visual and Performing Arts (050)</u>		3
Hours		15
Year 4		
Semester 1		
PHY 352K	Classical Electrodynamics I	3
PHY 369	Thermodynamics and Statistical Mechanics	3
M E 337F	Nuclear Environmental Protection	3
M E 337C	Introduction to Nuclear Power Systems	3
<u>U.S. History (060)</u>		3
Hours		15
Semester 2		
PHY 362L	Quantum Physics III: Particles and Nuclei	3
Hours chosen from: Upper-division PHY		3
M E 361E	Nuclear Reactor Operations and Engineering	3
M E 337G	Nuclear Safety and Security	3
<u>Humanities (040)</u>		3
Hours		15
Total Hours		126

Requirements

All requirements are listed below, starting with the most specialized moving to the most general. Additional requirements may follow the table, so be sure to read the entire page. Some required courses listed below may also satisfy [General Education](#) requirements, including [Core Curriculum](#).

Code	Title	Hours
Concentration		
CH 301	Principles of Chemistry I	3
or CH 301C	Foundations of Chemistry I	
CH 302	Principles of Chemistry II	3
or CH 302C	Foundations of Chemistry II	
Hours chosen from: Biology, geological sciences, or astronomy (A course may not fulfill this requirement if it does not count toward major requirements in its department)		6
M 408C	Differential and Integral Calculus	4
M 408D	Sequences, Series, and Multivariable Calculus (or the equivalent)	4
Hours chosen from:		4

M 427J	Differential Equations with Linear Algebra	
M X27K & M X27L	Advanced Calculus for Applications I and Advanced Calculus for Applications II	
Hours chosen from: Upper-division in mathematics (M 340L, M 361, and M 362K are recommended; only courses at the level of calculus and above may be counted toward the total number of hours required for the degree)		6
Hours chosen from: Upper-division physics, including:		24
PHY 336K	Classical Dynamics (or equivalent)	
PHY 352K	Classical Electrodynamics I (or equivalent)	
PHY 353L	Modern Physics Laboratory (or equivalent)	
PHY 355	Modern Physics and Thermodynamics (or equivalent)	
PHY 362L	Quantum Physics III: Particles and Nuclei (or equivalent)	
PHY 369	Thermodynamics and Statistical Mechanics (or equivalent)	
PHY 373	Quantum Physics I: Foundations (or equivalent)	
M E 337C	Introduction to Nuclear Power Systems	3
M E 337F	Nuclear Environmental Protection	3
M E 337G	Nuclear Safety and Security	3
M E 361E	Nuclear Reactor Operations and Engineering	3
M E 361F	Radiation and Radiation Protection Laboratory	3
M E 336P	Concepts in Nuclear and Radiation Engineering	3
<i>Subtotal</i>		72
Major (see details below)		12
Degree (see details below)		6
Free electives: Additional coursework to reach total hours required.		6
<i>Subtotal</i>		24
General Education		
Remaining Core Curriculum (42 hours total)		30
Foreign Language other than English, Beginning Proficiency		
<i>Subtotal</i>		30
<u>College Requirements - Natural Sciences</u>		
<u>General University Requirements</u>		
Total Hours		126

Major-Physics (BSPHy)

Code	Title	Hours
PHY 301	Mechanics	3
PHY 101L	Laboratory for Physics 301	1
PHY 316	Electricity and Magnetism	3
PHY 116L	Laboratory for Physics 316	1
PHY 315	Wave Motion and Optics	3
PHY 115L	Laboratory for Physics 315	1
Total Hours		12

Degree-Bachelor of Science in Physics

Code	Title	Hours
Foreign Language/Culture Choices		
One of the following foreign language/culture choices: (Students in Teaching and Physics Honors concentrations are exempt from this requirement)		6
<u>Foreign Language other than English, Beginning Proficiency</u>		

First course in a foreign language and a three-semester-hour course in the culture of the same language area

Total Hours

6

Additional Requirements and Policies

Students in all options must fulfill both the University's [General Requirements](#) for graduation and the [college requirements](#). They must also earn a grade of at least C- in each mathematics and science course required for the degree, and a grade point average in these courses of at least 2.00. More information about grades and the grade point average is given in the [General Information Catalog](#).

Upper-division Coursework

At least 21 semester hours of upper-division coursework, including at least 12 semester hours of upper-division coursework in physics, must be completed in residence at the University.