

# Physics B.A./B.S.

This program is recommended for students who wish to obtain industrial employment or who wish to continue their studies for an advanced degree in physics, engineering, science or applied mathematics. Students who successfully complete this program will have a good understanding of the role of physics within the sciences and within society. Graduates of this program will have a solid understanding of the principles and foundations of classical and modern theories of physics. They will have practiced the methods and techniques of experimental physics; they will have practical experience in utilizing the analytical and modeling tools of physics. This rigorous program of study develops analytical, problem solving and communication skills which are valuable in a wide range of employment areas. This program requires a second major or minor.

Physics is commonly held as the most fundamental science. Physicists work to understand the dynamics of our universe from the smallest scales to the largest, and to express this understanding using the smallest possible number of laws and principles. Physics students develop a facility with mathematics and an intuition for solving complicated physical problems using fundamental principles. The curriculum for physics majors includes core courses in physics, mathematics and related sciences, plus a selection of core curriculum requirements. Physics prepares students for careers in industry, education, and advanced study in nearly any technical or engineering field. Physics is also an excellent choice of major for pre-medical or pre-law students.

The faculty of the Department of Physics and Astronomy are active researchers in nuclear physics, condensed matter physics, organic semiconductor physics, astronomy and astrophysics, and physics education research. Participation in research programs by undergraduates is strongly encouraged. Facilities include our Organic Semiconductor Physics Laboratory, Surface Physics Laboratory, Campus Observatory, and research grade telescopes (located in Arizona, Chile, and on the island of La Palma) available via our membership in the SARA Telescope Consortium.

The Physics with Emphasis in Biophysics is an interdisciplinary program for students who love physics and math and who want to work on the complex problems related to biology and medicine. Biophysics involves the frontiers of both physics and biology, where the toolbox of physics and math is applied to quantitative problems in biology. This program provides excellent undergraduate preparation for graduate work in biophysics, bioengineering, biology, physics, chemistry, biochemistry, computational biology, medical physics, and neurobiology. The chemistry courses comprise a minor in chemistry.

## Core Curriculum Courses

See the Core Curriculum Requirements (<http://coursecatalog.tamuc.edu/undergrad/core-curriculum-requirements/>) 42

### Required courses in the major

PHYS 101	Physics and Astronomy Seminar	1
PHYS 119	Introduction to Python Computer Programming for the Physical Sciences	1
PHYS 2425	University Physics I *	
PHYS 2426	University Physics II	4
PHYS 317	Mathematical Methods for Physics and Engineering	3
PHYS 319	Computational Physics with Python	3
PHYS 321	Modern Physics	3
PHYS 332	Electronics for Scientists and Engineers	4
PHYS 333	Wave Motion, Acoustics, and Optics	4
PHYS 335	Advanced Physics Laboratory	3
PHYS 401	Current Topics in Physics and Astronomy (1 sh, must be repeated for total of 2 sh)	2
PHYS 411	Classical Mechanics	3
PHYS 412	Electricity and Magnetism	3
PHYS 414	Thermodynamics and Kinetic Theory	3
PHYS 420	Quantum Mechanics	3
PHYS or ASTR or MATH (Adv)		9

### Required support courses

MATH 2413	Calculus I *	
MATH 2414	Calculus II *	
MATH 2415	Calculus III	4
MATH 2320	Differential Equations	3
MATH 2318	Linear Algebra	3
CHEM 1311	General and Quantitative Chemistry I *	
CHEM 1111	General and Quantitative Chemistry Laboratory I	1

Second Major or Minor or Electives Required

18- 23 semester hours required in second major or minor or electives

18-23

**Total Hours****120-125**

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This course should be taken to fulfill Core Curriculum Requirements.

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These courses may apply on the second major or minor.

A grade of "C" or higher must be earned in all courses in this Major.

- Suggested second majors include mathematics, chemistry, computer science, and biology. Other choices are possible.
- Planning for a second major should not be delayed beyond the middle of the sophomore year. A minor in a second subject may be chosen instead of a second major. The choice of mathematics as second major allows for four additional courses to be elective. Many students select minors in both mathematics and computer science.