PHYSICS - BS

The Bachelor of Science curriculum is more rigorous in its physics and mathematics course requirements than the Bachelor of Arts. Currently it has a no-track option and five track options. The BS in Physics (no-track) is designed primarily for students who wish to pursue an advanced degree in physics or employment as a professional physicist in an industrial setting. The department also offers tracks in Astrophysics, Business, Computational Science, Physics and Mathematics Teaching and Physical Science Teaching for those who plan to seek employment or advanced degrees in these fields. Each track results in the BS in Physics degree and has the same core physics courses and the same total number of hours. Because physics forms the basis of many other sciences such as astronomy, chemistry, material science, oceanography, nanotechnology and geophysics, the BS program is excellent preparation for advanced degrees in these fields. In addition, physicists are increasingly applying their talents to molecular biology, biochemistry and medicine. An important part of the BS program is student participation in experimental or theoretical research guided by faculty.

Program Requirements

First Year
Fall
ENGL 104 or ENGL 103 Composition and Rhetoric or Introduction to Rhetoric 3
MATH 171 Calculus I 1 4
PHYS 101 Freshman Physics Orientation 1 1
PHYS 150 Introduction for Programming for Physics 1 3
American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history) 2 3
Semester Credit Hours 14

Spring
ASTR 102 Observational Astronomy 1 1
MATH 172 Calculus II 1 4
PHYS 206 & PHYS 226 Newtonian Mechanics for Engineering and Science and Physics of Motion Laboratory for the Sciences 1 4
American history (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history) 2 3
Language, philosophy and culture (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture) 2 3
Semester Credit Hours 15

Second Year
Fall
MATH 221 Several Variable Calculus 1 4
MATH 308 Differential Equations 1 3
PHYS 207 & PHYS 227 Electricity and Magnetism for Engineering and Science and Electricity and Magnetism Laboratory for the Sciences 1
PHYS 221 Optics and Thermal Physics 1 3
Semester Credit Hours 14

Spring
PHYS 225 Electronic Circuits and Applications 3
PHYS 309 Modern Physics 1 3
PHYS 331 Theoretical Methods for Physicists I 1 3
POLS 207 State and Local Government 3
Communication (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication) 3 3
Semester Credit Hours 15

Third Year
Fall
PHYS 302 Advanced Mechanics I 3
PHYS 304 Advanced Electricity and Magnetism I 3
PHYS 332 Theoretical Methods for Physicists II 3
Creative arts (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts) 2
Social and behavioral science (http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences) 2 3
Semester Credit Hours 15

Spring
PHYS 303 Advanced Mechanics II 3
PHYS 305 Advanced Electricity and Magnetism II 3
PHYS 327 Experimental Physics I 4 2
PHYS 328 Experimental Physics II 4 1
PHYS 412 Quantum Mechanics I 3
POLS 206 American National Government 3
Semester Credit Hours 15

Fourth Year
Fall
PHYS 408 Thermodynamics and Statistical Mechanics 4
PHYS 414 or PHYS 416 Quantum Mechanics II or Physics of the Solid State 3
PHYS 426 Physics Laboratory 2
Select one of the following: 5 2
ASTR 291 Research
ASTR 491 Research
PHYS 291 Research
PHYS 491 Research
Physics elective 6 3
Semester Credit Hours 14

Spring
PHYS 401 Computational Physics 7 3
PHYS 425 Physics Laboratory 2
Select one of the following: 5 2
ASTR 291 Research
A Physics major must complete the foundation courses (PHYS 101, PHYS 150, ASTR 102, PHYS 206/PHYS 226, PHYS 207/PHYS 227, PHYS 221, PHYS 309, PHYS 331, MATH 171, MATH 172, MATH 221, MATH 308) with a grade of C or better and have a 2.0 cumulative GPA before taking non-foundation upper-level Physics courses. Any course in this category from the approved University Core Curriculum list of courses. PHYS 327 is an approved W course. PHYS 328 is an approved C course. A combination of PHYS 291, PHYS 491, ASTR 291 and ASTR 491 must equal 4 hours. Students with a U1 or U2 classification should take PHYS 291/ASTR 291. Students with a U3 or U4 classification should take PHYS 491/ASTR 491. Select from ASTR 314, PHYS 414/PHYS 416, PHYS 489, MATH 460, or any graduate offering in PHYS or ASTR. To register for PHYS 401 a student must be able to program in a high level language. Any upper-division course in geo/life/physical sciences, mathematics/statistics, or engineering (except 485/491). Electives should be chosen in consultation with the student's academic advisor. Three hours must be in the area of International and Cultural Diversity, and three hours must be in the area of Cultural Discourse. These may be in addition to other University Core Curriculum courses, or, if a course in this category satisfies another area of the Core, it can be used to meet both requirements. Electives may be selected from any 100-499 course not used elsewhere, except ENGL 103; MATH 100-148, 165-166, 365-366 (http://catalog.tamu.edu/undergraduate/course-descriptions/math/); PHYS 201, PHYS 202.