The Department of Physics and Astronomy provides a multidimensional framework to support a variety of professional goals and interests of students. The curriculum available within the departmental program affords preparation for careers as physicists in government or industrial laboratories, for teaching in public schools or junior colleges, for entering advanced programs at the graduate level, or as a basis for studies leading to careers in engineering and other professional fields. Fundamental to the program are scientific facilities and faculty providing opportunities for practicing scientific inquiry, which is the basis for understanding the operation of the physical universe, from the smallest to the largest components.

Modern facilities and equipment enhance the instructional program of the department. Space on the first three floors of the Thompson Complex Central Wing provides classroom, laboratory, research, and computing space. The adjacent Hardin Planetarium supports astronomy laboratories and demonstrations for classes, as well as focused presentations of astronomy and the physical universe for school groups and the general public. A roof-top astronomical observatory provides students with convenient access to the department's 12.5 inch Cassegrain reflector and several smaller telescopes. The University Physics laboratories are equipped with modern laboratory equipment and data acquisition interfaces using software that is standard in the physics and engineering community. The Applied Physics Institute houses an X-ray diffractometer, neutron generator, Auger spectrometer, Beowulf Computer Cluster and a Large Chamber Scanning Electron Microscope. The solid state nano-science lab houses a micro-Raman spectrometer and a thermal Chemical Vapor Deposition reactor for nano-carbons and other nanomaterials. The laser lab houses a nanosecond IR laser, excimer laser, spectrophotometer, gas chromatography, and ultrahigh vacuum chamber. The department also operates two research grade astronomical telescopes: the local 0.6m Bell Observatory and the 1.3 Robotically Controlled Telescope (RCT) located outside Tuscon, AZ. From the beginning of their careers our students are exposed to modern laboratory equipment and methods.

The diversity of our faculty is a major strength of our undergraduate program, allowing students to benefit from a breadth of available interest and specializations. Undergraduate students are encouraged, in the course of their studies, to participate in a variety of research opportunities with faculty members. Individual student research projects may start as early as the sophomore year, supported in most cases by available assistantships or formal course credit. Descriptions of current research studies by faculty members and specific research opportunities available to undergraduate students are posted on the department’s website.

The department sponsors a local chapter of the nationally affiliated Society of Physics Students (SPS) for students interested in physics, as well as a section of the Sigma Pi Sigma honor society. The local SPS chapter sponsors or participates in a variety of social and service activities related to physics, including field trips, trips to scientific meetings, tutoring, and interacting with students from area schools.

The Hilltopper Astronomy Club provides support for students interested in astronomy both as a hobby and a science. Regular observing sessions, informal meetings, and various projects are some of the benefits available to members.

Physics is the basic science, and all of the programs outlined below are designed to provide a sound knowledge of physical principles. The programs are also flexible to the extent that the student can select related courses in biology, chemistry, geology or astronomy to prepare for a career in interdisciplinary areas such as astrophysics, biophysics, geophysics, environmental science or materials science.

When planning a program of study in this department, each student should be aware of the University academic requirements and regulations contained in this catalog in the chapter, “Academic Information.” Specific attention should be given to the sub-sections in the chapter entitled (a) Academic Programs, (b) Colonnade Requirements, and (c) Academic Requirements and Regulations.
Major in Physics

Reference Number: 754
Minimum Hours for Major: 35
Minimum Hours for Degree: 120
Degree: Bachelor of Science

Sample Degree Plan for Concentration:


The major in physics requires a minimum of 35 semester hours and leads to a Bachelor of Science degree. A minor or second major is required. The foundation for the undergraduate major is provided by a core sequence of six lecture and five laboratory courses, requiring a total of 29 semester hours. This core sequence consists of the following:

- PHYS 180 / PHYS 181 (4) Introductory Modern Physics and Lab
- PHYS 255 / PHYS 256 (5) University Physics I and Lab
- PHYS 265 / PHYS 266 (5) University Physics II and Lab
- PHYS 301 (1) Electrical Measurements Lab
- PHYS 302 (1) Atomic Lab
- PHYS 316 or PHYS 318 Computational Physics or Data Acquisition (3)
- PHYS 321 (3) Introductory Modern Physics II
- PHYS 350 (3) Classical Mechanics I
- PHYS 398 (.5) Junior Seminar
- PHYS 440 (3) Electricity and Magnetism I
- PHYS 498 (.5) Senior Seminar

The student majoring in physics must complete, in addition to this core, a minimum of 6 semester hours of selected upper division departmental courses. The selection is determined by the student’s career aspirations, subject to approval by the student’s departmental advisor. The upper division electives must be chosen from the courses listed for departmental majors and minors, excluding PHYS 389, PHYS 399, and PHYS 489. No more than 3 hours of PHYS 475 may be counted toward the 35 hour minimum requirement for the major. Support requirements include MATH 136, MATH 137, MATH 237, MATH 307 (or MATH 370 for applied physics track), and MATH 331; CHEM 120 / CHEM 121. (Support requirements differ for teacher certification; see below.) The department has prepared several career-oriented tracks, which detail relevant departmental electives and additional or departmentally-approved substitute support courses. Advising tracks currently defined within the Bachelor of Science in physics program include the following:

1. The general physics track is designed for those students who wish to pursue careers as physicists or are preparing for graduate study in physics.
2. The applied physics track combines extensive technical knowledge, related problem-solving skills, and computer techniques and internship opportunities to prepare students for positions in industrial and governmental laboratories.
3. The physics and astronomy track prepares students for careers in astronomy/space science and for graduate study in these areas.
4. The teacher certification track prepares students for careers teaching physics at the secondary school level. The student must also complete professional education requirements as specified by the School of Teacher Education. Students in this option must have a second major in science and math education (SMED).
5. Other - There are some specified programs such as a suggested pre-medication curriculum for students wishing to major in physics. Course recommendations for these tracks are available from the departmental office. In all cases, the student must work closely with the departmental advisor from the beginning to plan a program of study that meets departmental and University requirements and that maximizes preparation to meet career goals.

Transfer of Credit

Transfer courses are welcomed and approved through the Physics faculty and College Dean.

Minor in Astronomy

Reference Number: 318
Minimum Hours for Minor: 20

The minor in astronomy is designed to provide a background in astronomy, astrophysics, and planetary science for students from a wide range of backgrounds. Students who intend to undertake graduate work in astronomy should complete a major in physics with a minor in mathematics. A minor in astronomy consists of at least 16 credit hours of required core courses and at least 4 credit hours from the list of restricted electives. The core requirements are ASTR 214 (4 hrs); ASTR 314 (4 hrs); and an introductory sequence of classical physics: PHYS 255 / PHYS 256 and PHYS 265 / PHYS 266 (10 hours); or PHYS 201 and PHYS 202 (8 hours); or PHYS 231 / PHYS 232 and PHYS 332 / PHYS 233 (8 hours). Physics majors must substitute GEOL 111 / GEOL 113 for PHYS 255 / PHYS 256. The actual number of elective credit hours required for an astronomy minor is dependent upon satisfaction of the university requirement.
that at least one-half of the credits required for each major or minor be earned in courses numbered 300 and above. The list of restricted electives includes: ASTR 305, ASTR 414, PHYS 316, PHYS 441 / PHYS 404, PHYS 445, PHYS 450, PHYS 465, GEOL 325, GEOL 330, GEOL 350, GEOL 370, GEOL 420 or GEOL 465.

Minor in Biophysics
Reference Number: 329
Minimum Hours for Minor: 18

The minor in biophysics requires a minimum of 18 semester hours. This course sequence is intended to serve students of the life sciences, that is, students of biology, pre-medicine and pre-dental, agriculture, environmental health, psychology, science teaching, environmental engineering, pre-veterinary, pre-pharmacy and pre-optometry. In general, this curriculum treats the physics of life processes and various applications of physics to biology and medicine. (See the Biophysics section in this catalog.)

Required courses: PHYS 231 / PHYS 232, PHYS 321, PHYS 332, and at least 6 hours of upper division electives selected from appropriate physics and/or biology courses approved by a biophysics advisor.

Minor in Physics
Reference Number: 435
Minimum Hours for Minor: 23

The minor in Physics requires a minimum of 23 semester hours including the following courses: PHYS 180, PHYS 255, PHYS 265, PHYS 321, and a minimum of nine semester hours selected from the PHYS lecture courses in the course descriptions of this catalog, PHYS prefix, under the heading DEPARTMENTAL MAJORS AND MINORS.

Course Categories

1. Non-Science Majors
   General courses treating a selection of coordinated topics in sufficient depth to be beneficial to the non-science students; 100-level.

2. Science and Math Majors and Minors
   Introductory courses for science and math students; mainly 200-level.

3. Education Majors and Minors
   Upper division courses for prospective teachers; 300- and 400-level.

4. Department Majors and Minors
   Upper division courses for students following the program options of physics, physics education, dual-degree: 300- and 400-level.

Teacher Certification Programs

Students interested in high school or middle school certified teaching programs should refer to the SKyTeach program listed at the beginning of the section on Ogden College of Science and Engineering.

Graduate Programs

The Department of Physics and Astronomy offers the Master of Arts in Education (physics minor) and Master of Science in Homeland Security Sciences. For more information contact info@physics.wku.edu.

Department of Psychological Sciences

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Visiting Assistant Professor: M. Woodward
Instructor I: M. Asriel
Instructor II: H. Norman

The study of behavior is one of the most popular areas of interest for students worldwide. Studying human behavior from a scientific perspective offers numerous opportunities for students. A degree in Psychological Science can open up a wide variety of career options or serve as a foundation for graduate or professional study because, in addition to