

# PHYSICS

---

The Department of Physics offers several programs leading to the baccalaureate degree with a major in physics. The course structure recommended by the department is essentially identical during the first two years of all programs so that a revision in a student's plan need not involve any loss of time.

The Bachelor of Science degree in physics involves the greatest depth in physics and mathematics. This program prepares the student for employment in a technical position upon graduation and also provides a solid foundation for entrance into a graduate program in physics or other technical field.

The physics dual-degree program requires three years of study at Millersville in the liberal arts curriculum, with a physics major plus two years in residence in the engineering program at the cooperating institution, Penn State University. At the end of the five years, the student receives two baccalaureate degrees: a B.A. in physics from Millersville and a B.S. in engineering from the cooperating engineering school.

In addition to the 3/2 arrangement with Penn State, Millersville has three other cooperative programs. One of these is a 4/2 program with Penn State. A student studies for four years at Millersville and earns a B.S. degree in physics. After transferring to Penn State, in two years the student earns a master's degree from the Department of Engineering Science and Mechanics. In practice, it is possible to complete this program in less than two years. Up to six undergraduate credits at the 400 level in physics or mathematics may be transferred as graduate credit towards the master's degree at Penn State. Summer research programs at Penn State are also available and can generate graduate credit in this program. Consequently a student can finish the graduate portion of this program in a year and a half.

The other cooperative program with Penn State leads to a B.A. degree from Millersville with an option in nanotechnology. The standard courses for our B.A. physics degree are required. However, the student also spends a semester at the Penn State Nanofabrication Facility and earns 18 credits learning the use of specialized nanotechnology devices and techniques. The semester at Penn State typically occurs during the junior year.

Finally, the Department of Physics and the Department of Materials Science and Engineering at the University of Delaware have initiated a 3/2 program. In this program, the student spends three years at Millersville and two years at the University of Delaware. Upon completion of the requirements, the student is awarded a Bachelor of Arts degree in physics from Millersville and a master's degree in materials science and engineering from the University of Delaware.

The B.S. Ed. program in secondary education prepares students for careers in precollege teaching, providing certification in physics.

The cooperative education program in physics is an optional arrangement whereby students combine practical on-the-job experience with their formal classroom instruction. After the first year, the co-op program is available to all physics majors who satisfy the departmental admission requirements. For more information, see Cooperative Education in the Special Academic Opportunities (<https://catalog.millersville.edu/undergraduate/special-academic-opportunities/>) section.

Outstanding students majoring in physics may pursue departmental honors during their senior year. Participation in the departmental honors

program is highly selective and offers students in each of our major programs an opportunity to strengthen their background in physics and to work closely with a faculty mentor on an extended research project. General information on departmental honors is found in the Special Academic Opportunities (<https://catalog.millersville.edu/undergraduate/special-academic-opportunities/>) section of this catalog. Specific requirements for honors in each of our major programs are available from the department chairperson.

Two minor programs are also available for students who do not elect to major in physics. The physics minor offers students an exposure to physics through the intermediate level of our major program. In addition, there is also available an interdisciplinary minor in physics and earth sciences.

The department has prepared a student handbook which provides more detailed information on our programs, faculty and resources. This handbook, as well as additional information on any of the above programs, is available from the physics department