MATERIALS SCIENCE AND ENGINEERING, B.S.

Seven Penn State campuses are scheduled for closure after Spring 2027: DuBois, Fayette, New Kensington, Mont Alto, Shenango, Wilkes-Barre, and York. New students are not being admitted at these campuses.

Begin Campus: Any Penn State Campus

End Campus: University Park

Program Educational Objectives

The educational objectives of the undergraduate program are embedded into our mission statement. We will provide and maintain a curriculum that will prepare our recent graduates to accomplish the following Program Educational Objectives:

1. Our graduates provide science and engineering leadership in international industrial, governmental, and academic settings, while serving both their profession and the public.
2. Our graduates are innovators in a wide variety of technical fields including, but not limited to, materials, energy, electronics, medicine communications, transportation, and recreation.
3. Our graduates excel in careers relating to the entire life cycle of materials, from synthesis and processing, through design and development, to manufacturing, performance, reclamation, and recycling.
4. Our graduates engage in lifelong learning activities which enhance their careers and provide flexibility to respond to changing professional and societal needs.

We achieve these objectives by providing a rigorous but flexible curriculum that allows the student to design their degree in materials science and engineering to achieve their specific academic and professional career interests.

In addition to the cutting-edge curriculum, we provide many opportunities to strengthen the students' undergraduate studies through research experiences. For example, we typically have over 30% of the undergraduates actively engaged in materials research programs at Penn State. Further, we help facilitate opportunities for national and international internships and research in materials, where our students engage in highly impactful research in academia and industry and gain invaluable experiences and skills.

Student Outcomes

Student outcomes describe what students are expected to know and be able to do by the time of graduation. The Materials Science and Engineering program is designed to enable students to:

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. Communicate effectively with a range of audiences
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. Acquire and apply new knowledge as needed, using appropriate learning strategies
8. An ability to mindfully articulate and perform proper laboratory safety practices, identify hazards associated with an experiment, and appraise mitigation strategies.

Continuous Improvement

The Materials Science and Engineering program is committed to a continuous improvement process to ensure the highest standards of education are met. The program educational objectives and student outcomes are regularly evaluated to ensure they are being met. Some of the processes used to evaluate these objectives and outcomes include:

1. Faculty and student ratings of the extent to which course objectives and outcomes are being achieved
2. Exit interviews of graduating students
3. Alumni surveys
4. Industrial and Professional Advisory Council (IPAC) (also commonly referred to as the External Advisory Board (EAB)) reviews