You ARE the next generation of scientists
You are standing on the edge of the universe. Everything that you see, hear, touch, and taste is part of the world. From conducting research about the smallest molecule to measuring the largest galaxy, Eberly College of Science offers a broad range of studies that can help you understand your universe.

You are the face of the future, impacting the world around you. And, as you rise to that challenge, consider how the Eberly College of Science can help you achieve that goal. Take a look around ... because you are the next generation of scientists.
Penn State’s EBERLY COLLEGE OF SCIENCE offers fourteen majors in four disciplines: LIFE SCIENCES, PHYSICAL SCIENCES, MATHEMATICAL SCIENCES, and INTERDISCIPLINARY STUDIES. You can enroll in the Eberly College of Science at University Park, or you can complete the first two years of your Science degree at any undergraduate Penn State campus and then relocate to University Park to complete your degree. Or, you may choose to complete a bachelor’s degree in a limited number of science majors at Penn State Abington, Penn State Altoona, Penn State Berks, or Penn State York.

As a first-year science student, you are admitted to the Eberly College of Science rather than a specific major. (Exceptions are the Six-Year Premedical-Medical program and the Science B.S./M.B.A. program.) You will choose your major before your junior year, at which time you must meet entrance-to-major requirements. These may include a specific Penn State grade-point average and specified minimum grades in prerequisite courses.
THE LIFE SCIENCES are a collection of disciplines that investigate the structure and function of living things, from molecules to entire ecosystems. These rapidly advancing and thoroughly exciting fields of study include anatomy, animal biology, bacteriology, biochemistry, cell biology, ecology, evolutionary biology, genetics, molecular biology, plant biology, physiology, and virology. The life sciences are vital to increasing our understanding of human health, environmental issues, and broader matters that relate to the web of life on Earth. To fully understand the field, a strong background in chemistry, physics, and mathematics is important.

Research includes biochemistry, bioinformatics, biophysics, cancer biology, cell and computational biology, developmental biology, ecology, enzymology, evolutionary biology, gene regulation, genetics, genomics, infectious diseases, microbiology, neurobiology, organismal biology, physiology, plant science, proteomics, RNA biology, structural biology, theoretical biology, and virology. The life sciences are represented in the Department of Biology and the Department of Biochemistry and Molecular Biology.
**THE PHYSICAL SCIENCES** encompass the experimental, theoretical, and computational study of physical phenomena in our universe—involving matter, energy, and their interactions—by faculty and students in the Departments of Astronomy and Astrophysics, Chemistry, and Physics. Research interests in the physical sciences include basic science studies on topics as diverse as cosmology, gravitational waves, particle astrophysics, extra solar planets and pulsars, atomic-scale chemistry and clusters, biomolecular systems, and computer modeling of chemical reactions, as well as superconductivity, spintronics, ultracold atoms, and quantum computing. Research in more applied areas of the physical sciences has a large impact on fields such as materials science, nanotechnology, neuroscience, and biophysics.

**Astronomy and Astrophysics (B.S.)** [www.astro.psu.edu](http://www.astro.psu.edu)

This field examines the nature, origin, and evolution of the solar system, stars, galaxies, and the cosmos. The discipline applies physics and mathematics to understand these systems. This program exposes students to the most recent astrophysical theories, the momentous discoveries of space science, the newest reduction techniques for computer data analysis, and hands-on telescope viewing and instrumentation experience. Options offered are Computer Science and Graduate Study. While many Astronomy and Astrophysics graduates earn advanced degrees, some immediately begin careers in teaching, space-related industries, computer firms, and government research labs.

**Chemistry (B.S.)** [www.chem.psu.edu](http://www.chem.psu.edu)

Chemistry is a practical science, influencing many aspects of our daily lives and providing a way for us to understand the world. As a central science it focuses on matter—its structure, properties, and transformations—at the molecular level. Students who are strongly interested in the "how" and "why" of science enjoy the Chemistry major, in which a core set of chemistry courses is supported by mathematics and physics courses. Most chemistry students participate in research projects in addition to their classroom work. Many chemistry graduates go on to graduate and professional schools, while others choose immediate employment in research, chemical sales, marketing, and technical services.

**Physics (B.S.)** [www.phys.psu.edu](http://www.phys.psu.edu)

Physics is the study of the basic principles or laws that govern the natural world, and their application in physical systems on scales ranging from subnuclear (smaller than the nucleus), to the nanoscale sizes governing modern electronic devices, to cosmological distances. Physics students are curious about nature and enthusiastic about using mathematics as a tool to describe it.

Physics majors can work in hands-on lab courses, studying laser-based optics, modern electronic instrumentation, and computer data acquisition and analysis. They operate state-of-the-art equipment such as scanning tunneling microscopes that can see individual atoms. Undergraduates are encouraged to participate in research in areas as diverse as atomic/molecular, condensed-matter, and gravitational physics; particle astrophysics; and biological physics.

The major provides a strong program of experimental and theoretical work appropriate for research and development positions in industry and government, as well as excellent preparation for graduate study in physics or related fields. Physics graduates work in such areas as acoustics, astrophysics, biophysics, computer science, medical physics, physics education, and engineering-related disciplines. Options within the Physics major include General Physics, Electronics, Medical Physics, Acoustics, and Teaching.
The **THE MATHEMATICAL SCIENCES** are organized around principles of logical reasoning and computation. Mathematics arose from basic practices of measurement and counting, but has come to incorporate abstract ideas and constructions of considerable power. It is now a crucial tool in science and engineering, and with the advent of powerful methods of electronic computation, its importance is increasing. Specific applications include population dynamics, pricing of financial instruments, data encryption, and the modeling of a wide variety of biological and physical processes. Students interested in the mathematical sciences should have a strong interest in problem solving and a good background in high school-level mathematics.

**Mathematics (B.A., B.S.)**
[www.math.psu.edu](http://www.math.psu.edu)

The study of mathematics goes far beyond the algebra, geometry, and trigonometry taught in high school. At Penn State, Mathematics students focus on the basics of analysis and algebra, together with topology, number theory, logic, numerical analysis, dynamical systems, and differential equations. Options for the B.S. are Actuarial Mathematics, Applied Analysis, Computational Mathematics, General Mathematics, Graduate Study, Systems Analysis, and Teacher Certification. In addition to traditional employment opportunities in science, technology, and industry, jobs in actuarial science, systems analysis, and financial mathematics are expected to grow rapidly. Students are strongly encouraged to participate in the Co-op program to gain work and research experience.

**Statistics (B.S.)** [www.stat.psu.edu](http://www.stat.psu.edu)

This major is well suited for students interested in mathematics, computation, and the quantitative aspects of the sciences. It helps them prepare for careers in industry and government or for graduate study in statistics. The major provides students with the background needed to enter pharmaceutical research divisions, quality-control areas of manufacturing companies, clinical research units of drug companies, and other data-intensive areas. Applied Statistics, Biostatistics, Graduate Study, and Statistics and Computing options are available. Training in econometrics, psychometrics, and many other fields can result from the flexibility of the Applied Statistics option, which requires students to combine their statistical course work with a minor in some other field. Qualified candidates may also choose to earn an integrated B.S. in Statistics with a master of applied statistics (M.A.S.).
INTERDISCIPLINARY STUDIES The Eberly College of Science offers three majors and two special admission options that provide students with an interdisciplinary approach to the study of science. These programs offer broad-based study including mathematics, chemistry, biology, and physics. In addition to the required science courses, these majors typically include the flexibility to take a host of supporting elective courses in either the sciences or nonsciences.

Premedicine (B.S.)
www.science.psu.edu/premed

This interdisciplinary major includes required premedical science courses, health policy and medical ethics courses, and select upper-level courses from a range of departments. The four-year program is one of the college’s most popular premedical courses of study. However, under the three-year alternative, students can earn a B.S. degree in Premedicine after only three years at Penn State and one year at an accredited medical or dental school. There is also an early-assured admission option with Penn State’s College of Medicine at The Milton S. Hershey Medical Center. Our alumni report that Biology, Biochemistry and Molecular Biology, Chemistry, Microbiology, and Science majors also provide excellent preparation for medical and dental school.

Penn State has an acceptance rate of approximately 70 percent for all of our students applying to medical schools, compared with the national acceptance rate of 45 percent.

Premedical-Medical Program (B.S./M.D.)
SPECIAL ADMIT PROGRAM: Eberly College of Science and the College of Medicine at Thomas Jefferson University
www.science.psu.edu/premed/6ypremedprogram.html

This highly selective program, begun in 1963, is a cooperative effort between Penn State and the College of Medicine at Thomas Jefferson University in Philadelphia, Pennsylvania. Students can earn both the B.S. and M.D. degrees in six calendar years after graduation from high school. They will spend the first two years at Penn State’s University Park campus, then proceed to Jefferson Medical College for their regular four-year curriculum. The Penn State B.S. is awarded after successful completion of the second year at Jefferson Medical College, and the M.D. is awarded after successful completion of the fourth year. Students in this program have the option to extend their undergraduate experience by a year or two and defer their matriculation to Jefferson.
Many science students use this program to prepare for graduate school, professional school, or employment in a variety of science-related disciplines. It is also a popular major for those planning to pursue careers in such health-related professions as medicine, dentistry, optometry, podiatry, physical therapy, and physician assistant programs.

**Science B.S./M.B.A.**

SPECIAL ADMIT PROGRAM:
Eberly College of Science and
Smeal College of Business

[www.science.psu.edu/bsmba](http://www.science.psu.edu/bsmba)
[www.smeal.psu.edu/mba/index.html](http://www.smeal.psu.edu/mba/index.html)

This selective program provides outstanding and highly motivated students with the opportunity to combine an undergraduate degree in basic science with a graduate degree in business administration, preparing them to be the future leaders of the world’s scientific organizations. Students incorporate three semesters (usually two summers and one fall or spring semester) of cooperative education work experiences into the undergraduate portion of their program in order to better prepare them for entrance into Smeal’s MBA program. Students in this program also participate in a range of professional development activities throughout the completion of both degrees, developing the skills and network needed to succeed.

Students admitted to the program with Advanced Placement credits may be able to complete their dual degree requirements in five years. Other students will take six years to complete both degrees—still saving two to five years compared to students who take the traditional path leading to admission in Smeal’s internationally recognized MBA program.

**Science (B.A., B.S.)**

[www.science.psu.edu/sciencebs](http://www.science.psu.edu/sciencebs)

This interdisciplinary major provides a broad, general education in science, in which students may pursue either a bachelor of arts or bachelor of science degree. The program allows for a large number of supporting credits, giving students the flexibility to pursue a minor (or course sequences) in business, education, exercise science, technical writing, or other fields. This major was designed for those students who need flexibility in their course of study in order to meet particular educational and career objectives. Options for the bachelor of science include General Science, Life Science, Mathematical Science, and Physical Science.

**Forensic Science**

[www.science.psu.edu/forensics](http://www.science.psu.edu/forensics)

This interdisciplinary major combines the resources of several Penn State academic units with exposure to forensic science methodology and investigative techniques. Students will learn state-of-the-art laboratory methods from experienced educators who are experts in their fields. The principles of crime scene investigation, presentation of physical evidence, laboratory analysis, interpretation of results, and scientific writing are taught in Penn State’s own crime scene house. Course work combined with practical training will provide the academic knowledge, laboratory skills, and interpretive abilities required for a career in this rapidly growing area. This major provides a strong foundation in the biological sciences and physical sciences, specifically in the areas of forensic chemistry, forensic anthropology, forensic biology, and other related social sciences.

Graduates can pursue employment as scientists in federal, state, or private crime laboratories associated with law enforcement or other government agencies. Opportunities also exist in such public and private sector areas as insurance, homeland security, and the judicial community. Students may pursue graduate study, specializing in areas such as forensic psychology, anthropology, pathology, odontology, entomology, or toxicology. Those who pursue graduate study may assume leadership positions in public or private crime laboratories or academic institutions. Graduates may also choose to attend medical or law school.
Resources for Students

Student Advising Services
www.science.psu.edu/advising/index.html

At the Science Advising Center, you’ll be assigned a faculty member or professional advisor who knows what Penn State offers and can help you align your interests, abilities, and aspirations with the academic program that will allow you to maximize your potential for success.

During your first two years, you can take courses from various disciplines, including required General Education courses. An adviser can help you plan the best course of study.

Once you choose your major you can enrich your education by participating in various programs, such as Cooperative Education, study abroad, faculty-supported undergraduate research, or student clubs and organizations related to your major.

If you are interested in a career in the health professions, the Health Professions Advising Office (located in the Science Advising Center) can assist you in compiling the preprofessional committee letter of evaluation required by most medical and dental schools.

Science Cooperative Education Program
www.science.psu.edu/coop

The Science Cooperative Education Program allows science students to integrate academics with relevant work experience through alternating semesters of work and study. Co-op students apply their classroom knowledge to real-life work situations. They graduate with a degree and close to a year’s worth of related work experience to assist in the transition to graduate or medical school, professional programs in law or business, or the full-time workforce.

Organizations that hire Penn State science students for co-ops range from pharmaceutical companies to government research institutions. Co-ops are available throughout the United States, and there are a limited number of international opportunities. Recent co-op employers include:
- Centocor
- GlaxoSmithKline Pharmaceuticals
- IBM
- Johnson & Johnson
- Lutron Electronics
- McNeil Consumer and Specialty Pharmaceuticals
- National Institutes of Health
- Naval Surface Warfare Center
- U.S. Steel Corporation
- Walter Reed Army Institute of Research

Science Abroad
www.science.psu.edu/scienceabroad

Penn State’s Education Abroad Office and the Eberly College of Science coordinate a number of study abroad opportunities specifically for science majors. As a science student, you can spend a summer, semester, or year studying science at one of the nine partner universities in Canada, England, France, Germany, New Zealand, and Singapore. While abroad, you can progress toward your degree or complete general education or language courses while gaining insight into other cultures and the international importance of science.

Penn State also offers more than 150 other study abroad programs in nearly fifty countries. We strongly encourage science students to consider studying abroad, and offer advising assistance and travel grants to help you start exploring the world.

Student Clubs and Organizations
www.science.psu.edu/academic/clubs.html

While the Eberly College of Science places a high level of importance on academic performance, we also recognize the importance of experiences beyond the classroom. Clubs and student organizations provide great opportunities to interact with your peers while participating in social and professional development activities. There are many student clubs and organizations related to the various majors within the college, in addition to the hundreds of clubs and organizations open to all Penn State students.

Undergraduate Research
www.psu.edu/dept/oue/research/research.html

Scientists “do” science by conducting research. As a student, you may participate with Eberly College faculty in a wide variety of basic and applied investigations. Our faculty members conduct more than 3,000 research projects in a number of areas, from the discovery of new planets to the identification of new animal species. If you’re interested in a particular area of research, there’s a good chance a science faculty member has a project related to it. You may participate in undergraduate research for academic credit or pay, contributing a few hours a week between classes to a research effort. Currently, more than one-third of our juniors and seniors participate in a research activity with a faculty member.

Scholarships
www.science.psu.edu/academic/scholarship.html

A limited number of scholarships and awards are available through the University, the Eberly College of Science, and various departments and programs within the college. The science scholarships, many of which are departmentally based, are typically awarded when a student has entered into a major.

Schreyer Honors College
www.scholars.psu.edu/index.cfm

If you have excellent SAT scores (at least 1350 is recommended on the traditional math and verbal component) and are near the top of your class in grades and high school program rigor, you are encouraged to apply to the Schreyer Honors College. As a Schreyer Scholar, you enroll in small honors classes, work closely with honors advisers, and conduct independent research for your senior thesis. All first-year Schreyer Scholars receive the Academic Excellence Award, renewable for a total of eight semesters, as well as grants for international travel, summer internship stipends, special interest housing options, and course registration priority.

Science Diversity Initiatives
www.science.psu.edu/diversity/

The Office of Science Diversity Initiatives provides services for students, faculty, and staff in the Eberly College of Science and promotes diversity within the University and college. Some of the many programs coordinated through the Office of Science Diversity Initiatives include:

- research programs such as WISER (Women in Science and Engineering Research)
- special living options such as the First Year In Science and Engineering (FYSE) House located within the Pennypacker Experience, a scholarly and diverse living/learning community
- student clubs like Minorities in Science and Technology (MIST) and the Student National Medical Association (SNMA)
For more information about research, courses, faculty, and facilities, visit the Eberly College of Science on the Web at www.science.psu.edu. To help you decide if Penn State’s Eberly College of Science is the right choice for you, we offer individual visits and prospective student events year-round. Also, the Undergraduate Admissions Office offers tours and information sessions year-round to help you decide if Penn State is right for you.

Contact the Undergraduate Recruitment Office for more information or to arrange a visit:

UNDERGRADUATE RECRUITMENT OFFICE
EBERLY COLLEGE OF SCIENCE
THE PENNSYLVANIA STATE UNIVERSITY
108 WHITMORE LAB
UNIVERSITY PARK PA 16802-6100
Phone: 814-865-2609
E-mail: recruitment@science.psu.edu
www.science.psu.edu

To schedule a visit or for admission information, contact:

THE UNDERGRADUATE ADMISSIONS OFFICE
THE PENNSYLVANIA STATE UNIVERSITY
201 SHIELDS BUILDING BOX 3000
UNIVERSITY PARK PA 16804-3000
Phone: 814-865-5471
Fax: 814-863-7590
E-mail: admissions@psu.edu
www.psu.edu/dept/admissions/
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