

# CHEMISTRY

The Department of Chemistry, approved by the American Chemical Society (ACS), offers two degree programs leading to the baccalaureate degree with a major in chemistry. There are six options available within the B.S. degree program that allow students to pursue focused study in specific areas of chemistry. The recommended course sequence during the first year is identical for all programs and differs minimally through the junior year, meaning that a change in career emphasis within chemistry need not delay graduation. Completion of specific requirements within their program qualifies a graduate for certification by the department to the American Chemical Society, which offers immediate membership eligibility in the ACS as well as more desirable employment opportunities.

The Bachelor of Science degree (B.S.) offers intensive training in chemistry and mathematics with the greatest flexibility in selecting broad training that covers all areas of chemistry. This degree is designed specifically for students who wish to pursue graduate studies or employment as a chemist.

The biochemistry option provides enhanced study in the chemistry of life processes and macromolecules. This program offers the best preparation for acceptance to medical or dental school as well as graduate programs or lab work that includes biological techniques.

The environmental chemistry option provides focused study in areas that involve the traditional chemistry of the atmosphere, hydrosphere, geosphere, and biosphere. The study of environmental chemistry prepares students for work related to environmental analysis, industrial hygiene, or engineering.

The polymer chemistry option focuses on chemistry that forms the basis of production of plastics, synthetic fibers, paints, coatings, adhesives, and many other chemical products. This program is especially relevant for students planning work in industrial settings or materials development.

The nanotechnology option provides study in the control of materials at very small dimensions to make smaller, cheaper and better materials used in many fields. Students in this program spend a semester at the Penn State University Park campus in their nanofabrication facility. Graduates can pursue graduate studies or employment in materials science.

The engineering instrumentation automation option provides an interdisciplinary program focused on using, controlling, and improving instruments for chemical analysis and interpreting/analyzing data. This degree includes study of industrial electronics, control systems, and robotics that prepares graduates for scientific careers where instrumentation plays a key role, including industry, forensics, or graduate school.

For students wanting a career in teaching chemistry at the high school level, the Bachelor of Science in Education degree (B.S.Ed.) provides a sound background in chemistry as well as the necessary pedagogical methods courses.

An important program option in chemistry is an internship that integrates on-site learning applicable to any of the above degree options. Internships offer students invaluable experience in a job related to their career goal as well as financial remuneration, which helps significantly to defray the expenses of college study. Beginning after the first-year, students choosing this option may alternate periods of on-campus study

with off-campus employment until graduation. In addition, up to three credits may be approved to count toward major sequence requirements for each internship experience; up to six credits may be counted toward degree requirements. For more information, see Cooperative Education in the Special Academic Opportunities (<https://catalog.millersville.edu/undergraduate/special-academic-opportunities/>) section.

The chemistry 3+4 pre-pharmacy option within the B.S. program requires three years of study as a chemistry major in the Millersville liberal arts curriculum along with coursework from the first year in the Lake Erie College of Osteopathic Medicine (LECOM) Pharmacy school program. At the end of the four years, the student receives a B.S. in chemistry degree from Millersville, and after seven years, the student receives a Doctorate in Pharmacy degree from LECOM.

Students majoring in other sciences can readily round out studies in chemistry to complete one of three minors. Additional coursework provides deeper expertise in chemistry, biochemistry, or environmental chemistry that expands professional opportunities.