

MAJOR IN CHEMISTRY

This Bachelor of Science in Chemistry is certified by the American Chemical Society (ACS). Chemistry, the central science, engages biochemistry, biology, engineering, and environmental and materials sciences. Chemists synthesize compounds ranging from life-enhancing medicines to the materials of modern society, with the understanding that there can be unintended consequences. Chemists collect and analyze data used in policy decisions, including those involving the air, food, soil, and water. Chemists develop materials and processes that are safer, and are more energy and material efficient. Chemists develop processes for the recovery and conversion of waste to raw material.

With these important and diverse roles, chemists need to be skilled at the various arts of chemistry, conversant with other scientists as well as policy decision makers, and cognizant of the diverse impacts that their works have on society. Chemistry majors develop a solid foundation in general chemistry and mathematics, followed by coursework in organic chemistry, analytical chemistry, physical chemistry, inorganic chemistry, chemical biology, and physics. The curriculum is rounded out by courses in the liberal and communications arts.

Learning Outcomes

Upon earning a bachelor of science degree in chemistry, students will be able to:

- Demonstrate foundational skills and knowledge in all the major sub-disciplines of chemistry (analytical, biological, inorganic, materials, organic, and physical).
- Demonstrate rigorous in-depth skills and knowledge in at least two of the sub-disciplines.
- Exhibit valuable laboratory skills in all fundamental areas of chemistry, enabling them to contribute effectively to a professional laboratory as well as engage in original research.
- Use visualization tools, theory, computation, and simulations to explain experimental results, make predictions, and test hypotheses.
- Obtain, organize, and critically evaluate chemical information, and effectively present it coherently through oral and written discourse with specialists and non-specialists alike.
- Ethically and responsibly engage their knowledge of chemistry to address current global and societal challenges.
- Apply sustainability principles that incorporate complex environmental, economic, and social factors.

Potential Occupations

Chemists are employed in a vast array of professional fields in private industry, government, and education. Chemists work in research and development, analysis and testing, consulting, industrial quality control and assurance, environmental resource management, and forensics. Principal employers are petrochemical firms, biotechnology firms, consumer chemical firms, environmental testing laboratories, pharmaceutical companies, agricultural companies, governmental regulatory agencies, governmental and educational research laboratories, and manufacturing firms. Many chemists are also engaged in startup companies. Chemistry is also an excellent major for those preparing for careers in veterinary medicine and the health professions. Students whose career goals involve teaching at the secondary school level have

the opportunity to complete the teacher licensure program through the School of Education (<http://soe.chhs.colostate.edu/>).

Many possible occupations for chemists include, but are not limited to: agricultural chemist, air and water quality analyst, biochemical technician, chemical sales and marketing representative, clinical chemist, consultant, educator, forensic analyst, laboratory technician/bench chemist, materials analyst, patent examiner, pharmaceutical chemist, polymer technician, technical writer, and toxicologist.

Concentrations

- Environmental Chemistry Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-sciences/chemistry/chemistry-major/environmental-chemistry-concentration/>)
- Forensic Chemistry Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-sciences/chemistry/chemistry-major/forensic-chemistry-concentration/>)
- Health Sciences Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-sciences/chemistry/chemistry-major/health-sciences-concentration/>)
- Sustainable Chemistry Concentration (<http://catalog.colostate.edu/general-catalog/colleges/natural-sciences/chemistry/chemistry-major/sustainable-chemistry-concentration/>)