

MAJOR IN CHEMISTRY, MATERIALS CONCENTRATION

Chemists study the atomic and molecular structure of physical matter and analyze how it changes. Materials chemists study large and/or extended materials without defined molecular bounds such as polymers and extended inorganic solids. More specifically, they investigate how atoms and molecules may be combined to create materials that can produce useful or improved products. They also develop methods to measure materials properties such as strength and conductivity, enabling insight into a range of processes solar photo conversion, renewable plastics, energy storage, and drug delivery.

Chemistry majors are encouraged to participate in undergraduate research. Ample opportunities exist for undergraduate students to become involved in ground-breaking research in the laboratories of individual faculty members. Students have access to state-of-the-art equipment in faculty laboratories and the Central Instrument Facility including NMR, FTIR, UV/Vis, fluorescence, and mass spectrometers, vacuum lines, x-ray diffractometers, and many more. Undergraduate research is strongly encouraged for any student considering a career in chemistry and many students complete supervised research for academic credit.

Learning Objectives

Upon successful completion, students will be able to:

1. Demonstrate rigorous in-depth skills and knowledge in materials chemistry, and at least one other sub-discipline.
2. Describe how the characterization and analysis of materials is distinct from molecular species.
3. Describe one or more applications of materials that cannot be accomplished by typical molecular species.
4. Demonstrate use and analysis of data acquired by one of the methods used to analyze material, such as scanning electron microscopy, transmission electron microscopy, wide-angle x-ray diffraction, small angle x-ray diffraction, and/or dynamic light scattering.