

## THE FIELD

Chemistry occupies the central position among the sciences. Most of the phenomena in the biological and physical worlds that constitute our environment are ultimately explained in terms of the physical and chemical processes of molecules and atoms. The field itself is uncommonly broad, impacting fields such as environmental chemistry, medicinal chemistry, neurochemistry, polymer chemistry, materials chemistry, and biochemistry. A chemist may decide to specialize in one or more of the subdisciplines in order to pursue a particular interest.

Chemists can pursue their work on purely theoretical grounds or on an experimental basis. An example of the former is the physical chemist who seeks a mathematical model of the chemistry of the combustion process. Inorganic and organic chemists may seek ways to synthesize bioactive compounds to find new drugs to treat diseases. An analytical chemist may be involved in investigating new approaches to measuring the identities and amounts of drugs in body fluids. The mechanism of protein-folding is a major concern to biological chemists. Often, in today's laboratories, teams of various types of chemists are engaged with other scientists to find solutions to problems.

Chemists share a common core of knowledge and methodology, which is then applied to fields ranging from biology to materials science.

### ***A minor in chemistry is available.***

Chemistry students may pursue secondary education certification in conjunction with the major. See the education major sheet, website, or the Guide to Undergraduate Programs ([umass.edu/education](http://umass.edu/education); [umass.edu/ug\\_programguide](http://umass.edu/ug_programguide)) for more information.

## THE MAJOR

Students choose either the bachelor of arts (BA) or the bachelor of science (BS) curriculum. The BS curriculum is most suited for research careers, while the BA curriculum offers increased flexibility for careers such as law, teaching, or sales. Both degrees include required courses in physics and math, laboratory courses, and the Junior Year Writing requirement. The BS curriculum also includes a required research experience. BS graduates whose program includes appropriate courses will be certified by the American Chemical Society (ACS). It is expected that, by the end of the first year, students will consult with a faculty advisor to select the curriculum most suitable to their goals.

Chemistry may be elected as the area of primary concentration in the science major, an interdepartmental program administered by the College of Natural Sciences Advising.

## HONORS

Chemistry students may pursue honors opportunities within the major. Contact Commonwealth Honors College ([umass.edu/honors](http://umass.edu/honors), [info@honors.umass.edu](mailto:info@honors.umass.edu)) or the honors coordinator within the Department of Chemistry for more information.

## STUDY ABROAD

Majors may choose to study abroad if it supports their academic and career goals. Students should contact the International Programs Office (413-545-2710, [umass.edu/ipo](http://umass.edu/ipo)) and work closely with their academic advisor to choose the appropriate courses in preparation.

## **CAREER OPPORTUNITIES**

Career opportunities for the chemist with a BA or BS are many and varied. Some typical areas in which BA or BS graduates find work include:

**Research and Development**—synthesis or analysis of the chemical properties of pharmaceuticals and biologicals

**Technical Sales**—serving the chemical or medical fields through technical knowledge of instrumentation and molecules

**Regulation**—developing policy and regulations as part of federal and state regulatory agencies

**Management**—organizing and operating small to medium-size chemical processing companies

In addition, chemists are engaged in a large number of related fields, including medicine, dentistry, law, secondary school education, administration, scientific journalism, and illustrative arts. Students and graduates are also encouraged to look for more information on the ACS website ([acs.org/content/acs/en/careers/college-to-career.html](http://acs.org/content/acs/en/careers/college-to-career.html)).

## **COLLEGE OF NATURAL SCIENCES**

The College of Natural Sciences unites the life, environmental, computational, and physical sciences on campus. Students take advantage of a range of inquiry-based classroom and laboratory experiences, hands-on undergraduate research opportunities, multidisciplinary and cross-departmental education and research initiatives, and a variety of science student organizations. In addition, they are encouraged to develop strong written and oral communication skills, as well as leadership and problem-solving abilities.

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