

Chemistry

The
University
of Akron

CHEMISTRY

Often called the “central science,” chemistry deals with everything in the material world and with all living things at their most fundamental — molecular and atomic — level. Chemistry defines the composition, structure and properties of matter, and it describes the energy released or absorbed when matter undergoes change. Branches of the science include analytical, biochemical, inorganic, organic and physical chemistry.

The world would be quite different if chemistry were not an important part of it. Chemistry has helped us to understand and combat disease, discover and develop countless materials, explore and retain safe energy systems, and realize the promise of such areas as nanotechnology and biotechnology.

Expert in specialized instrumentation and equipment, chemists conduct research to examine, test and verify new knowledge, products and inventions. Because they design appropriate technologies to measure, identify and evaluate changes in matter, chemists find work in research and development, in production and quality control, in industry and academe.

Most often, chemists specialize in a branch of the science:

Analytical chemists study the structure, composition and nature of a substance by examining its various elements and components.

Biochemical chemists' work encompasses biology and chemistry.

Organic chemists study the chemistry of carbon compounds that comprise all living things.

Inorganic chemists study compounds consisting mainly of elements other than carbon, such as electronic components.

Physical chemists examine the physical characteristics of atoms and molecules and the properties of matter.

DEGREE PROGRAMS AT UA

The University of Akron offers American Chemical Society (ACS) certified B.S. and B.S. with Polymer Option degrees as well as a B.A. degree. The B.S. degrees are ideal for those who wish to pursue higher level degrees in chemistry, such as the Ph.D., while the B.A. offers more flexibility for the student who wishes to earn a minor in another field. The B.A. is an ideal degree

FOR MORE INFORMATION, VISIT THESE WEB SITES:

Department of Chemistry: <http://www.chemistry.uakron.edu/>

Buchtel College of Arts and Sciences: <http://www.uakron.edu/colleges/artsci/>

The University of Akron: <http://www.uakron.edu>

Office of Admissions: <http://www.uakron.edu/admissions/>

Honors College: <http://www3.uakron.edu/honors/>

Center for Career Management: <http://www.uakron.edu/ccm/>

U.S. Bureau of Labor Statistics: <http://www.bls.gov/>

U.S. Bureau of Labor Statistics Occupational

Outlook Handbook: <http://www.bls.gov/oco/>

for individuals interested in pursuing an M.D. or preparing for the Doctorate in Pharmacy at the Northeastern Ohio Universities College of Medicine and Pharmacy (NEOUCOM), of which UA is a partner. The B.S. with Polymer Option is one of only 13 programs nationally approved by the ACS.

As a graduate of our program, you will have a thorough background in the five branches of chemistry — analytical, biochemical, inorganic, organic, and physical chemistry — that prepares you for advanced study in chemistry or a career in industry or government. If you have an interest in polymer chemistry, you can pursue a study of that field through elective courses or the B.S. with Polymer Option.

The Department of Chemistry emphasizes scholarship through academic programs designed to meet national standards for content. In addition, the application of theory taught in the classroom is practiced in a laboratory setting in undergraduate laboratory classes and undergraduate research projects. We encourage undergraduates to carry out an independent research project in a field such as organic, inorganic or polymer synthesis, nanotechnology, drug design, laser spectroscopy or environmental analysis. This combination of theory and application is essential for a well grounded education in chemistry.

Since our department sponsors several seminars each year, undergraduates are able to learn about the latest advances in chemistry. Those who complete research projects are encouraged to attend a professional meeting and present the results of their research to professionals from academia, industry and government.

Chemistry undergraduates use state-of-the-art instrumentation in undergraduate

laboratory classes as well as in independent research projects. Our department maintains over \$8.6 million worth of nuclear magnetic resonance instrumentation, as well as mass spectrometers, X-ray diffractometers, IR-UV-Vis spectrometers and analytical instruments, such as liquid and gas chromatographs, all used for the identification, purification and characterization of chemical compounds. Our department also houses a modern chemical stockroom with over 1,100 items used in chemical research.

The strength of the undergraduate program in chemistry is built upon the strength of the department's faculty. While our faculty combined have more than 324 years of experience in undergraduate teaching, the quality of our undergraduate courses stems from faculty experienced in carrying out their own research. All have received federal and industrial support for their research projects, and all regularly publish in scientific journals. This commitment to chemistry and research brings vibrancy to the undergraduate curriculum.

Based on statistics collected over the past five years, our undergraduate alumni report finding satisfaction in industrial careers (27 percent), professional schools (3 percent) and in advanced study to obtain a Ph.D. (70 percent). Our students have gone on to attend some of the highest ranked chemistry Ph.D. programs in the country, including Purdue University, The Ohio State University, University of Florida, Case Western Reserve University and The University of Akron.

CAREER OPPORTUNITIES

Most chemists work in the manufacturing industry, primarily in chemical manufacturing, according to government reports. Chemists also work for state and local government in research development and testing services; for the departments of Health and Human Services, Defense, Agriculture and for the Environmental Protection Agency. Chemists with advanced degrees hold faculty positions at colleges and universities.

Chemists with an understanding of business, marketing and economics are sought after as more are called to contribute their skills to interdisciplinary teams. Entry-level positions in chemistry require at least a bachelor's degree; research positions typically require an M.S. or Ph.D. degree.

Overall, career opportunities are expected to grow for chemists, especially in drug research, development, testing and manufacturing industries. Graduates with experience in industry through academic laboratories, internships, fellowships or co-ops stand out among job seekers.

AKRON ADVANTAGE

The college offers job-related services through its A&S Careers Program, which creates links between students, alumni and local professionals.

As a Buchtel College of Arts and Sciences student, you have access to its lending library of up-to-date, career related publications; resume writing workshops, and research on employment statistics. The program also functions as a clearing house for internships, cooperative education experiences and volunteer opportunities. You will be mentored by the program staff as well as by your chemistry advisor about career options.

There are several student groups for extracurricular activities in chemistry and chemistry-related areas (such as chemical engineering and biology). Participation in student organizations can provide valuable experience and an opportunity to interact with other chemistry students and professionals.

HIGH SCHOOL PREPARATION

High school students considering the chemistry program at The University of Akron are encouraged to follow the college prep curriculum while in high school.

This includes four years of English, three years each of math, natural science and social science, and two years of foreign languages. Clear, concise writing skills also are imperative to academic success. If you have not completed the recommended courses, you may be required to take University courses to meet the basic criteria.

THE UNIVERSITY OF AKRON

You may already know that The University of Akron is the public research university for Northern Ohio. But we're much more than labs and lasers.

Our 24,700 students choose from approximately 300 academic programs and areas of study, from accounting to zoology. Many of our undergraduate programs have gained national recognition, including psychology, sales and marketing, dance, global business and gerontological nursing.

About 7,000 students live in our 12 residence halls or just a short walk from campus. When they aren't hitting the books, thousands take advantage of the University's fraternities, sororities and more than 200 student organizations, from gospel choir and alpine skiing to career-building professional and academic societies. We also offer 17 intramural sports and clubs, from bowling to cardio kickboxing.

The University's ongoing, major campus renovation campaign that began in 2000, the "New Landscape for Learning," has added 11 new structures, including two classroom buildings, as well as 30 acres of green space and numerous additions. This transformation continues today — UA's first on-campus football stadium is scheduled to be completed in time for the Zips' 2009 home opener.

Here's more of what you'll find at the new UA:

- Student Recreation and Wellness Center, a massive structure with ball courts, fitness facilities, rock climbing wall and a recreational pool that includes a 30-seat spa, "lazy river" and fountain.

- Student Union, containing a movie theatre, billiards/bowling room, food court, Starbucks, bookstore and headquarters for student organizations.

- Honors Complex with combination residence hall and academic facilities.

- Gardens, lawns, amphitheatre and tree-lined pathways.

You'll also discover a campus retooled for your academic success. We are Ohio's most wired-for-wireless public university, and can provide you reduced-rate, high-speed Internet access off campus.

ADMISSION INFORMATION

The Office of Admissions
330-972-7100 or 800-655-4884
<mailto:admissions@uakron.edu>
<http://www.uakron.edu/admissions/>

Sample Curriculum

Bachelor of Science Degree in Chemistry

First year:		Fourth Year:	
English Composition I, II	7	Humanities in Western Tradition	4
Principles of Chemistry I, II, Lab	7	Humanities electives	6
Pre-calculus math	4	Area Studies	4
Social Science requirement	6-8	Advanced Inorganic	3
Qualitative Analysis	2	Advanced Chemistry Lab III	2
Analytical Geometry-Calculus I	4	Chemistry electives	7
Physical Education/Wellness	1	Total	26
Total	32-34		
Second Year:		Chemistry Electives:	
Introduction to Public Speaking		Internship in Chemistry	1-3
or		Biochemistry I	3
Effective Oral Communications	3	Biochemistry II	3
Organic Chemistry I, II, Labs	10	Advanced Organic Chemistry	3
Analytical Geometry-Calculus II, III	8	Honors Research	1-2
Elementary Classical Physics I, II	8	Special Topics: Chemistry	1-2
Beginning Language I, II	8	Research Problems	1-2
Total	37	Introduction to Elastomers	3
Third Year:		Introduction to Plastics	3
Physical Chemistry I, II,	6	Polymer Science	4
Advanced Chemistry Labs I, II	4	Molecular Structure & Physical	
Analytical Chemistry	6	Properties of Polymers I	2
Intermediate Language I, II	6	Molecular Structure & Physical	
Differential Equations	3	Properties of Polymers II	2
Total	25	Molecular Structure & Physical	
		Properties of Polymers III	2