

Chemistry & Biochemistry

www.uaf.edu/chem

Degree Programs

B.A. Chemistry

Chemistry is the study of the atomic and molecular basis of the world around us. This major emphasizes laboratory and lecture classes in organic chemistry, inorganic chemistry, analytical chemistry, and physical chemistry (mathematical fundamentals). The B.A. degree is suitable for those wishing to teach chemistry, work in chemistry-related commerce, or continue on to medical or dental school.

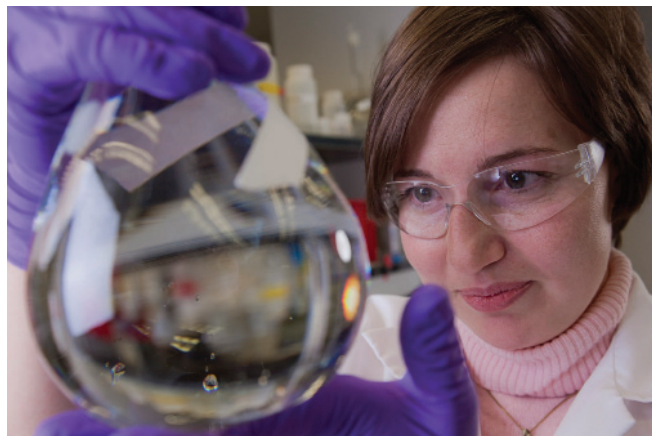
B.S. Chemistry

This degree requires further work in biochemistry and inorganic chemistry, and a senior project.

There are four areas of undergraduate emphasis:

- Chemistry
- Environmental chemistry
- Biochemistry/molecular biology
- Forensic chemistry

These are accredited by the American Chemical Society (ACS). The ACS degree allows students to continue in research-related jobs, or attend graduate school in a related discipline.



Chemistry student working in a lab. Photo by Todd Paris, University Marketing & Communications.

M.S. Chemistry

Graduate school introduces students to advanced coursework in several areas of chemistry, and a research project culminating in a thesis. Students work one-on-one with a UAF professor as a research mentor. Together with a graduate advisory committee, you and your professor design a program of courses and research that suits your professional goals. The M.A. in chemistry is similar but does not require a thesis. Teaching and research assistantships support most M.S. and Ph.D. students in the department.

M.S. & Ph.D. Environmental Chemistry

Graduate students work with scientists from UAF's Geophysical Institute, The Institute of Northern Engineering, or the U.S. Cold Regions Research and Engineering Laboratory to study circumpolar arctic and sub-arctic environments, including the impact of global warming and volcanic emissions.

M.S. & Ph.D. Biochemistry/Molecular Biology

Students work alongside scientists from UAF's Institute of Arctic Biology on advanced research projects relating to hibernation, cold weather adaptation, neuroscience, environmental health issues, and the identification of medicinal chemicals from high latitude plants.

About the Department

The department is a national leader in bringing new chemistry instructional methods to students. Grants from the National Science Foundation have been obtained to install advanced chemistry instrumentation including a nuclear magnetic resonance (NMR) spectrometer, a gas chromatograph-mass spectrometer (GC-MS), computational chemistry hardware and software, and advanced chromatography equipment. These are incorporated into chemistry courses from the freshman to graduate level. In addition to lecture and lab courses, there are a wide variety of research opportunities.

Students have investigated greenhouse gases, natural products, computational chemistry, organic synthesis, Arctic haze, industrial pollution, and the fate of hydrocarbons in the environment. Others have performed research in the areas of stroke, obesity and aging, environmental health, enzyme structure and mechanism, and comparative biochemistry and some have refined techniques to detect blood at crime scenes.

Alaska is a fantastic outdoor laboratory for chemistry and other sciences. Our research students are often found sampling sea ice off Point Barrow, collecting volcano emissions from Mr. Redoubt or other volcanoes along the Pacific Rim of Fire, studying smoldering Black Spruce forests after a forest fire, or isolating medicinal compounds from the potent Bog Blueberry. On campus, most labs and classrooms are housed in the Reichardt Building, which is also shared with Physics and Geology. Research students may also work in labs located in the Geophysical Institute or Institute of Arctic Biology on the nearby West Ridge.

Graduate students are an integral component of this research, both in the laboratory and the field. Research institutes provide excellent environments for research in atmospheric sciences as well as interdisciplinary research with scientists in other research areas.



Fairbanks blueberries- Photo by Todd Paris, University Marketing & Communications.

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