

Department of


Chemistry

An undergraduate program overview

Chemistry.IllinoisState.edu



ILLINOIS STATE
UNIVERSITY
Illinois' first public university



Why chemistry at Illinois State University?

Kristy Moore '93

Technical director, Renewable Fuels Association, Washington, D.C. (telecommutes to Washington from Heyworth)

I graduated in December 1993 with a B.S. in chemistry. I did a couple years of research under Dr. Wayne Zeller. I have completed several hours toward my master's degree—unfortunately life got in the way of me finishing that. (Having two kids can do that!)

I work nearly exclusively in organic chemistry (hopefully) playing an integral part in the development of new transportation fuels, primarily ethanol. Understanding fuel composition, materials compatibility, and chemical interactions with metals, plastics, and elastomers, and ultimately understanding how these fuels need to work in spark-ignition engines is an everyday task for me. The well-rounded curriculum in the chemistry program at ISU has provided a solid base of support for this work. The research-based program, as well as spending nonclassroom time in the laboratory and library understanding and visualizing chemistry at work, is a true benefit for students.

(continue on page 3)

YOU CAN CHOOSE from hundreds of programs in chemistry, so why pick Illinois State University? Imagine you could visit 100 schools and pick the best aspects of each one to build your ideal college home. Illinois State is likely to be closer to that ideal than any other school. Why? We have the resources and research opportunities of a large university but the love for teaching and the student-centered philosophy of a small college.

With Illinois State's chemistry program you definitely get the best of both worlds. Here are some specific examples of the opportunities and personal attention provided by the department:

- There is a degree option for all interests, including forensic chemistry, chemical sales, biochemistry, chemistry teacher education, and traditional chemistry.
- Professors will teach all of your chemistry classes; nearly every lab will have a professor and a teaching assistant.
- You will be able to choose from 20 undergraduate research advisors and more than 20 advanced elective courses.
- There is no doctoral (Ph.D.) program in chemistry, so resources are devoted exclusively to undergraduate students and master's-level graduate students.
- You will have hands-on access to research-grade equipment.
- Professors will know you by name, and you will get to know many of them.
- The department publishes about 30 papers per year, many with undergraduate co-authors.
- The faculty holds more than \$2 million in active research and educational grants.
- The department is consistently one of the 30 largest producers of American Chemical Society certified degrees in chemistry and in the top 10 schools without a doctoral program.

Programs

The Department of Chemistry offers a variety of programs to meet your interests and prepare you for the future. These programs lead to a Bachelor of Science degree that is certified by the American Chemical Society (ACS).



Biochemistry

This combination of chemistry with cellular and molecular biology is ideal for students interested in careers in the medical, biotechnology, or biochemistry fields. Students take courses in the biological and chemical sciences and have the opportunity to do research in the field. This program is appropriate for students considering careers in medicine, dentistry, optometry, pharmacy, veterinary medicine, or graduate study in biochemistry, pharmacology, etc.

Chemistry teacher education

Students planning to teach chemistry and other sciences in high school should enroll in the chemistry teacher education program. This program is fully certified by the National Council for Accreditation of Teacher Education (NCATE) and the National Science Teachers Association (NSTA). The Illinois State University teacher education program is unique in that it leads to a professional chemistry degree that is ACS-certified and students have access to an on-campus laboratory school.

Chemical and pharmaceutical sales

A career in chemical or pharmaceutical sales requires expertise beyond the traditional chemistry degree. A chemistry degree with an emphasis in chemical and pharmaceutical sales combines the Bachelor of Science in chemistry with a concentration in sales offered by the Marketing Department in the College of Business.

Forensic chemistry

A knowledge of the law is critical for forensic chemists, law enforcement agents, and homeland security-related jobs. The emphasis in forensic chemistry combines a Bachelor of Science in chemistry with coursework in criminal justice sciences to prepare students for such careers.

Graduate school preparation

Careers in research, law, and academics often require an advanced degree. The graduate school preparation option exposes students to advanced study in their subfield of interest and allows students to do a cutting-edge research project with a member of the faculty. This sequence will prepare you for the rigors of graduate study.

Traditional chemistry

Many graduates seek careers in industrial or governmental labs. The traditional chemistry option gives students a broad-based education in chemistry that will prepare them for a variety of jobs in the chemical field.

(continue from page 2)

Perseverance is a must, and I strongly recommend participating in a research project. You can be a great "chemist" even if you don't work in a laboratory every day! Having a degree in chemistry from ISU is a real asset—I'm living proof.

I would also encourage ISU to support students who don't necessarily want to work every day in the laboratory. Science-educated workers are needed at all levels of the workplace. And with the president of the United States strongly supporting a "green" initiative opportunities abound for chemists!

Raymond Lesniewski '87

M.S. '90 from University of Illinois-Chicago

Science Department chair and chemistry teacher, Jones College Prep, Chicago

As a high school chemistry teacher, you quickly learn that having a strong background in content knowledge and a well-developed instructional philosophy are key components to creating a successful classroom atmosphere for your students. My experiences in the ISU chemistry program have helped me develop a rich understanding of chemical concepts by providing me with opportunities to take an active role in my own learning process. I have also been greatly influenced by the thoughts and ideas of many of my professors. Their unique approaches to chemical education provided me with novel examples of how to engage my current students. The ISU chemistry program provided me with a strong foundation in both content knowledge and pedagogical principles to begin my teaching career.

Chemistry teaching is a great career! Every day is a new challenge to help today's students become critical thinkers for tomorrow's society. It is an awesome and rewarding responsibility.

Michelle Etheridge '92

Forensic scientist, Illinois State Police, Chicago

The professors and support staff in the Chemistry Department at ISU have a great love for what they are doing, and it shows. I was always able to go to the professors with questions and find an answer. They helped point me in the right direction, challenged me to dig a little deeper, and cared for my success as a person and a student. I will always carry wonderful memories of ISU with me and use the knowledge I have gained.

James Alstrum-Acevedo '98

Ph.D. '05 from University of North Carolina

Primary patent examiner, United States Patent and Trademark Office, Annandale, Va.

ISU's chemistry program provided me with a strong foundation in chemistry that facilitated my success at the University of North Carolina and later on at the United States Patent and Trademark Office by stimulating my curiosity about chemistry and science in general, enhancing my critical thinking skills, and providing me with many opportunities to do undergraduate research at ISU and in Mexico. The Chemistry Department faculty is genuinely interested in teaching, sharing their enthusiasm for chemistry and learning, and encouraging their students to aim high in setting their professional and academic goals. The department's professors are flexible and open to letting students explore their interests and even modify lab experiments. For example, in Professor Cheryl Stevenson's Physical Chemistry Lab, my lab partner and I were permitted to modify an electron paramagnetic resonance (EPR) experiment by preparing a deuterated naphthalene derivative and studying how deuteration of naphthalene affected the resulting EPR spectrum.

The Chemistry Department faculty is a great resource, and they are there in your corner to help you

(continue on page 5)

Our home

The Science Laboratory Building (SLB) is where you will put your education into practice. The building houses most of the department's labs (for teaching and research), faculty offices, and a fully stocked chemical storeroom. Opened in 1997, the

building features a spacious atrium that is a popular location for lunch, studying, and informal meetings. We have invested millions of dollars in the latest chemical instrumentation so that you have hands-on experience with the same equipment you will be using after graduation.

A student resource room, the department offices, several classrooms, and a computer lab are located in Julian Hall, which is connected to the Science Laboratory Building by an enclosed walkway. This building is named for the prominent chemist Percy Lavon Julian, who was a member of the Illinois State University board of regents and the National Academy of Sciences.

The department has an impressive assortment of high-tech instrumentation for teaching and research, nearly all of which is available for undergraduate students to use. All areas, including the laboratories and study areas, have Wi-Fi access.



Your fit

Research

Four out of every five students work with a faculty member on a research project. Students select projects with one of the 20 research-active faculty members, and then work side by side with that professor. This is one of the most important activities a student can choose; it develops laboratory skills, independence, and a sense of camaraderie with the research advisor and the other members of the research group. Many students become co-authors on papers that appear in the scientific literature and present their results at local, regional, national, and international conferences. Undergraduate research will stand out as a major accomplishment on your résumé!

Chemistry Club

Share your enthusiasm for chemistry, science, and public service through the Chemistry Club. This student organization, which is a recognized student affiliate chapter of the American Chemical Society, meets frequently for social events (making tie-dyed shirts, bowling, eating liquid nitrogen ice cream, and playing *Rock Band* are popular activities). Club members also raise funds for undergraduate travel awards and research grants. Several times a year they make outreach visits to local schools and the Children's Discovery Museum, relating their love of science through their popular chemical demonstrations. The Chemistry Club has been frequently recognized for excellence by the American Chemical Society.

Chemistry Resource Room

The social and academic gathering place for chemistry students is the Chemistry Resource Room in Julian Hall. Here you can work on homework, browse job and graduate school opportunities, and discuss your latest assignment. Tutors hold office hours here for many of the first-year chemistry courses.

Sol Shulman Atrium

Dedicated to the memory of longtime faculty member Sol Shulman, the atrium of the SLB serves as an informal place to study, soak up the sun, or even take a short nap. Comfortable seating is available on three different levels, all with a southern exposure and a panoramic view of the campus.

Financial aid

The University maintains a database of scholarship opportunities at ScholarshipFinder.IllinoisState.edu. Following are some scholarship and employment opportunities for students in the Department of Chemistry:

Chemistry Club travel awards and research grants

Financial support is available through the Chemistry Club for travel to professional meetings and for undergraduate research projects. Support is reserved for members doing undergraduate research. The amount and number of awards depend on the availability of funds.

Shulman Scholarship

The Shulman Scholarship is awarded to select incoming and continuing chemistry majors. Contact the department at Chemistry@IllinoisState.edu for the latest application information.

Sedgwick Memorial Scholarship

The James "Ben" Sedgwick Memorial Scholarship is awarded annually to an advanced undergraduate student or a graduate student with an interest in physical or computational chemistry.

Tutoring

Many chemistry majors earn extra money working as private tutors for students taking chemistry courses at Illinois State University, Heartland Community College, and local high schools.



Undergraduate research assistantships

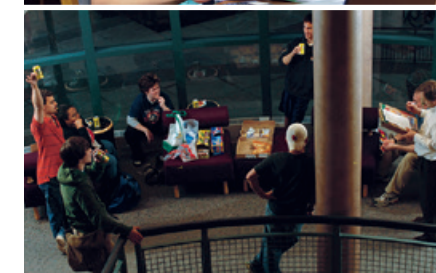
A limited number of undergraduate research assistantships are available to students in their third or fourth year. Only certain professors with externally funded research grants can provide this support.

Undergraduate teaching assistantships

Each semester the department hires several undergraduate students to serve as teaching assistants for a laboratory class. These positions are awarded on a competitive basis and are excellent opportunities to teach side by side with a faculty member.

Work-Study opportunities

A limited number of work-study students are employed in the department, usually to help in the Chemistry Storeroom. Generally students must have completed first-year chemistry to be eligible.



(continue from page 4)

succeed and learn. Participate in undergraduate research; give a talk and a poster presentation to strengthen your written and oral communication skills, because your ability to communicate effectively will be just as important to your success as the ability to understand chemistry, math, or any other subject matter.

H. Thomas Karnes '77

M.S. '82, Ph.D. '84 from University of Florida

Professor of pharmaceuticals, Virginia Commonwealth University, editor of *Journal of Chromatography B*, Richmond, Va.

The most important component to success in the sciences is to evaluate your interest in research as soon as possible. This will help you to make important career decisions early. As chemistry majors at Illinois State, my friends and I were all encouraged to participate in research, and many research opportunities were provided to us. We were all encouraged to get our feet wet in research early, and many of us published our work as undergraduates. It was not for everyone, and those who did not take to it mostly went to professional schools or became teachers. Undergraduate education at a major university can be somewhat impersonal, and one can get lost in the research enterprise. Chemistry at Illinois State was not like this. The faculty treated you like family. The focus was on education and doing the right thing for the students. During these formative years, I matured professionally and decided that I wanted to be an analytical chemist and an academic researcher, mostly because of the positive influence of the excellent faculty in chemistry at ISU.

You should seek balance in all things.

Jan Hoh '83

Ph.D. '91 from California Institute of Technology

Associate professor of physiology, Johns Hopkins University, Baltimore

To new students who might be interested in research I would say to be careful to distinguish what is important from what is popular or happens to be easy to do with the tools at hand. There is an enormous amount of science that goes on because people can do it—not because they really think it is high on the list of unsolved problems. Also, be true and honest to yourself about your science. It is really easy to head down a wrong path further than needed—because one is not sufficiently self-critical. And everyone goes down the wrong path occasionally.

Nichole DePaul '00

M.S. '08 from Western Governors University

High school chemistry teacher, YES Prep North Forest, Houston

The Department of Chemistry at Illinois State University offered many chemistry courses for students to specialize in a particular discipline of chemistry. Also, every professor in chemistry worked on different research topics, and students were able to choose the type of chemistry they would like to research.

I was always interested in analytical chemistry and instrumentation, and ISU offered that area of chemistry during my time at the school. Since my focus was on analytical chemistry, it allowed me to understand the workings of instruments that I would use in my future career as an engineer and chemist in the bowling industry, and as a chemistry teacher in Texas in AP chemistry and Pre-AP chemistry.

Now that I am working on my Ph.D. in secondary science education, I also have the support of the Department of Chemistry at Illinois State. Both Dr. William Hunter and Dr. John Baur have been instrumental in my decision to continue to pursue this terminal degree that will emphasize chemical education

(continue on page 7)

Careers in chemistry and biochemistry

Graduates with a Bachelor of Science in chemistry are skilled at critical thinking, synthesizing complex ideas, and analyzing technical data and information. The degree opens many doors and leads to exciting, varied, and even unconventional careers.

Many scientific, technical, engineering, manufacturing, legal, medical, and environmental industries rely on the expertise of a chemist. Chemists are involved in making products safer, better, and less expensive. They develop ways to monitor natural and man-made chemicals in the environment, and look for ways to prevent and clean up pollution. They use science to solve and to deter crimes, to protect homeland security, and to craft legislative policy. All employment sectors hire chemists; academic institutions, private industries, the military, and governmental agencies all need chemists!

Following is a sampling of the types of careers a chemist might choose:

- Agricultural chemist
- Biomedical/Cancer researcher
- Chemical safety officer
- Chemical sales representative
- Chemistry professor
- Dentist
- Drug discovery researcher
- Environmental attorney
- FBI agent
- Food scientist
- Forensic scientist
- High school teacher
- Materials chemist
- Patent examiner
- Pharmaceutical sales representative
- Pharmacist
- Physician
- Polymer chemist
- Quality assurance chemist
- Technical writer
- Veterinarian
- Water quality chemist

If you have an interest in any of these careers, consider the following programs or options at Illinois State University:

[Biochemistry major](#)

[Chemistry major with emphasis in chemical and pharmaceutical sales](#)

[Chemistry major with emphasis in forensic chemistry](#)

[Chemistry teacher education](#)

[Chemistry graduate school preparation](#)

[Traditional chemistry](#)

Unemployment rates among chemists are typically well below the national average, and starting salaries are higher than for most other sciences. For the latest information about the job market and information about starting salaries, visit the American Chemical Society website at ACS.org and click on Careers.

Admission

Although admission requirements to the chemistry major are the same as those for admission to Illinois State University, a strong background in mathematics is essential for success and timely completion of the degree. Year-one students should have demonstrated a strong ability for algebra and trigonometry (as evidenced by their ACT math score or their score on the Math Placement Test) and should be ready for calculus by the second semester of their first year. Having 3-4 years of a foreign language, a technical writing (or other communications) course, and leadership experience will put you on the right track toward timely graduation. Students seeking more guidance should contact an advisor by sending a request to Chemistry@IllinoisState.edu.

Illinois State University

Gov. William Bissell signed a bill on February 18, 1857, to create a normal school and establish the Board of Education of the State of Illinois as its governing body. The bill stipulated that the permanent location would be the place that offered the most favorable inducements. Jesse W. Fell took up the campaign for Bloomington and obtained financial backing totaling \$141,000. Abraham Lincoln, acting as attorney for the board, drew up the bond guaranteeing that Bloomington citizens would fulfill their financial commitments. Consequently, Illinois State Normal University was founded as the first public institution of higher education in the state. Established as a teacher education institution, Illinois State has developed into a multipurpose university with degree programs at the bachelor's, master's, and doctoral levels. The University enrolls students from throughout Illinois, 49 other states, the District of Columbia, and 67 other countries. Students are mentored by a faculty that includes numerous teacher-scholars recognized at national and international levels and is dedicated to superior teaching.

Conveniently located in Central Illinois, the University is situated at the intersection of three major highways, as well as along the Chicago-St. Louis railroad corridor. Because of its easy access in a region of strong economic growth and its multidimensional profile, Illinois State is able to respond to the varied needs and interests of its constituents and to contribute to the development of its students as responsible citizens.

Library

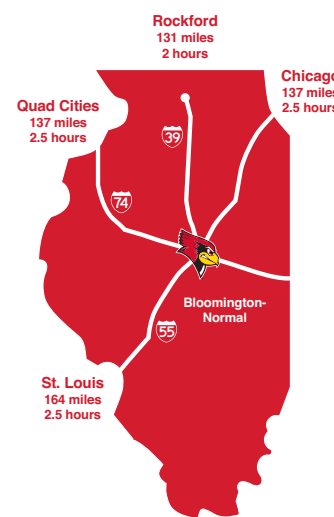
Milner Library is an active partner in the teaching, learning, research, and service activities of Illinois State University. Milner librarians provide research assistance and library instruction customized to meet the needs of students and faculty. Reference collections include general, as well as subject-specific, print, and electronic research tools including indexes, handbooks, dictionaries, bibliographies, directories, and bibliographic and full-text databases.

Milner's collections include

- 1,622,355 print volumes
- 81,448 electronic serial titles
- 1,927 print journal titles

Honors Program

The Honors Program provides an opportunity for scholarships, unique academic experiences, research mentorships, and opportunities to improve oral and written communication skills. Students interested in earning departmental and university honors should contact the Honors Program at Honors@IllinoisState.edu and a Chemistry Department advisor at Chemistry@IllinoisState.edu.



(continue from page 6)

and changes in the way chemistry is taught to high school students.

Take advantage of the knowledge the professors at ISU possess. They have so much information about the chemical industry, and they will offer advice to help you in your decisions to put you on the right track.

Get involved in the Chemistry Club. They provide many opportunities for the chemistry students. One in particular is the opportunity to travel to American Chemical Society national and regional meetings. These meetings help you make connections with potential employers in chemistry and chemical sciences.

Dr. Matt Bussan '00

DVM '04 from University of Illinois Veterinarian, Town & Country Animal Hospital, Normal

Even though my job does not require much chemistry on a daily basis, my chemistry degree provided a good preparation for veterinary school and beyond. I had a great mixture of classroom time along with undergraduate research, where I learned to work independently on a variety of projects. I developed a good skill set that allowed me to succeed in postgraduate school, and which I still use today.

I greatly enjoyed my time at ISU. I have many fond memories, and am glad that I attended ISU for my undergraduate degree. The Honors Program was excellent. I had small class sizes with good faculty interaction and received a well-rounded education. I go back each year at Homecoming to see everyone in the department.

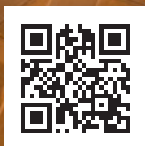
Alumni success

Since 2000, dozens of alumni have completed their doctoral degrees in chemistry, medicine, veterinary medicine, or other related fields. The nearly 1,900 living alumni of the department are employed by a wide variety of firms, universities, and agencies, with titles including president, cardiologist, environmental scientist, director of environmental health and safety, lab manager, medical oncologist, organic chemist, professor, sales manager, science editor, senior director of marketing, and special agent. The department is one of the largest producers of high school chemistry teachers, with hundreds employed throughout the state and nation. When you join the chemistry family at Illinois State University, you are immediately a part of a nationwide professional network that can help you land your first job.

Chemistry.IllinoisState.edu



@ISUCHEMISTRY



DEPARTMENT OF
CHEMISTRY
Illinois State University

This document is available in alternative formats upon request by contacting the Department of Chemistry at (309) 438-7661.

An equal opportunity/affirmative action university encouraging diversity

UNIVERSITY MARKETING AND COMMUNICATIONS 15-1285 printed on recycled paper ♻️