

# Cutting-Edge Programs, Smart People, Cool Research

# Your Future at Illinois Tech

## CHEMISTRY

Illinois Tech is a small, private university that educates students to go on to do big things. For graduates of our **Department of Chemistry**, this has included leading an experimental group at Lawrence Livermore National Laboratory, directing a new initiative on the environment at Massachusetts Institute of Technology, and much more.

What does this mean for you? You'll experience the same **easy access to chemistry professors, allowing for research opportunities, letters of recommendation, and connections in the field.** Illinois Tech's rigorous chemistry degree programs are diverse, customized, and area-focused. You will get into the lab with your professors and **put chemistry to work**, going beyond the traditional discipline as you gain advanced training in high-value and emerging areas. Innovate, experiment, and gain relevant experience while benefiting from the capacity of a major research institution.

### CHEMISTRY B.S. DEGREES AT ILLINOIS TECH

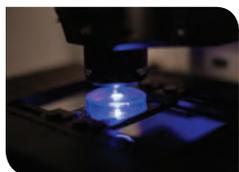
Illinois Tech's competitive, accredited Chemistry program offers you a distinctive education and advanced training in relevant and in-demand chemistry fields. This includes a number of first-of-its-kind B.S. degrees. Receive your bachelor's degree in a chemistry specialization that is of greatest interest to you.

- B.S. in Chemistry
- B.S. in Bioanalytical Chemistry
- B.S. in Computational Chemistry and Biochemistry
- B.S. in Environmental Chemistry
- B.S. in Forensic Chemistry
- B.S. in Medicinal Chemistry

### SPECIAL PROGRAMS

- Pre-Medicine and Pharmacy Concentrations and Dual Admissions Programs
- Honors Law

### RESEARCH—EVEN AS AN UNDERGRAD



Chemistry undergraduates at Illinois Tech get the opportunity to work on major research right from the start. Our new **Elevate** program consists of summer courses that allow all undergraduates to experience research early in their careers at

Illinois Tech (the summer after your first year, or the summer before your first year for transfer students). Selected students can work in a research lab through a **\$5,000 Summer Research Stipend program.**



## Our Chemistry Programs

### CHEMISTRY

Illinois Tech's B.S. chemistry program provides rigorous education in the fundamental areas of chemistry: analytical, inorganic, organic, physical, and biochemistry. Learn the basic science of chemistry as well as its practical aspects and numerous applications. Be equipped with the knowledge, skills, and experiences for industrial careers in research and development, chemical analysis, or chemical manufacturing and marketing. The B.S. chemistry program also provides pre-professional training for careers in medicine, law, business, and other areas of science and health care.

### BIOANALYTICAL CHEMISTRY

Bioanalytical chemistry is a key discipline in biomedical research for application in biological processes, detection of human diseases, and preclinical and clinical trials of small molecule drugs and biomolecules, including proteins, DNA, enzymes, and antibodies. **Illinois Tech is the first university in the country to offer a bioanalytical chemistry B.S. program.** Gain a background in bioanalytical methods for detection and quantification of biological systems. Receive a rigorous education in traditional chemistry and the requisite knowledge and analytical and technical skills to develop a competitive career in bioanalysis, clinical chemistry, point of care chemistry, proteomics, and biomedical, clinical, and pharmaceutical science.

### COMPUTATIONAL CHEMISTRY AND BIOCHEMISTRY

Prepare to advance in the rapidly growing fields of computational and data science with a strong background in traditional chemistry areas and relevant and advanced skills in experimental and computational science. **Illinois Tech is the only university to offer a comprehensive computer-related program with course requirements covering chemical science, biochemical science, computational techniques, and data science.** Study chemical and molecular modeling and simulation, computational drug design, and computational methods for data analytics.

### ENVIRONMENTAL CHEMISTRY

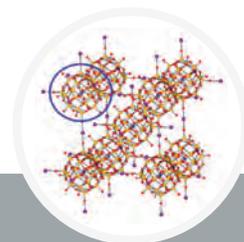
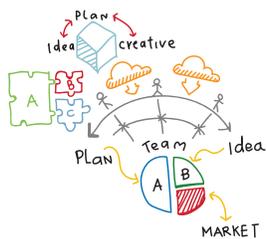
Learn and discover chemical solutions to environmental issues: environmental protection and remediation, energy, green chemistry, environmental analytical chemistry, and more. **The only program of its kind in the Chicago area,** the environmental chemistry B.S. program offers a rigorous education in traditional chemistry paired with an interdisciplinary background in environmental chemistry. Gain advanced analytical and technical skills to develop a career in environmental analytical chemistry, environmental toxicology, environmental science, or environmental health science.

### FORENSIC CHEMISTRY

**Illinois Tech is the only university in the Chicago area to offer a B.S. program in forensic chemistry.** Engage with a rigorous education in traditional chemistry areas and an interdisciplinary background in forensic analytical chemistry, forensic drug analysis, and forensic investigation. Gain systematic training in chemical and forensic drug analysis and detection of forensic and controlled substances to develop a career in forensic science, forensic toxicology, forensic drug analysis, DNA analysis, or criminalistics.

### MEDICINAL CHEMISTRY

Learn to apply chemical science to drug design, synthesis, and discovery for the detection, treatment, and cure of human diseases. **The only program of its kind in Illinois, and one of only a handful in the country,** Illinois Tech's medicinal chemistry B.S. program will provide you with a strong background in both traditional chemistry areas and a sound interdisciplinary understanding of drug design, action, and analysis. Gain technical skills required to advance in the biomedical, medical, or pharmaceutical fields.



## RESEARCH ON THE CUTTING EDGE

Our faculty are pushing the boundaries of what we know in many areas, including:

- **Energy:** Catalysis for solar energy conversion, sustainable chemical synthesis, and functional materials for energy storage and harvesting beyond lithium-ion batteries (*Jean-Luc Ayitou, Adam Hock, Ishaque Khan, Braja Mandal, Yuanbing Mao*)
- **Computational Science and Big Data in Chemistry:** Computational simulation and drug design, data analysis, and computational modeling of bio-organic, biochemical, magnetic, and organometallic systems (*David Minh, Andrey Rogachev*)
- **Environment and Forensics:** Biosensors for bioterrorism, environmental toxins, DNAs, and proteins; environmental remediation; green chemistry and photocatalysis (*Jean-Luc Ayitou, Joy Chong, Richard Guan*)
- **Bioanalysis and Health:** Computational analysis of protein-drug interaction, discovery of anti-cancer agents and antibody drug conjugates, microscopic analysis of biomaterials and cellular interactions, molecularly targeted therapy and imaging of disease (*Joy Chong, David Minh, Rong Wang*)

## LEARN TO INNOVATE IN IPROS

In Illinois Tech's signature **Interprofessional Projects (IPRO) Program**, you'll work with students from various majors to solve real-world problems. Recent chemistry-oriented IPROs include:

- Terraforming urban soils and use of appropriate food-process technologies
- Simulating and visualizing molecules moving through biological nanopore sensors
- Developing a new strategy to search for smuggled nuclear material
- Fabrication and commercialization of high-power lithium-ion batteries



"I have my exceptional education and the letters of recommendation from professors to thank for my acceptance into pharmacy school and my postdoctoral fellowship. Every door in my academic and professional career has been opened thanks to the professors at Illinois Tech."

—Emily Mick (Chemistry '10)

Emily received her Pharm.D. from the University of Illinois at Chicago, worked for AbbVie, and is currently a postdoctoral fellow with the University of North Carolina and IQVIA in the area of pharmacokinetics.



**Chemistry Professor Joy Chong** conducts interdisciplinary research projects aimed at developing safe, effective, and targeted drugs for cancer and neurodegenerative diseases. Her lab has developed several promising cancer therapeutic and diagnostic agents with successful preclinical profiles that are favorably compared to the existing anti-cancer drugs.

## Preparing for Your Future

## HANDS-ON CHEMISTRY



"The education I received as an Illinois Tech chemistry major directly helped me with my coursework, especially in topics such as biochemistry and pharmacology. Knowing the chemistry behind the reactions we learned may not be essential to a clinician, but it gives me a better understanding of what is happening in the body, it taught me how to think analytically, and it gives me insight into why certain medical decisions are made."

— **Kamil Bober** (CHEM '12), Camras scholar, Northwestern University Feinberg School of Medicine



"The research-oriented education that I received from Illinois Tech enabled me to make an immediate impact in graduate school and to stand out from my peers."

— **Ryan McClure** (Chemistry '11)  
Graduate of the Northwestern University Ph.D. program, Senior scientist at AbbVie

## STAND OUT

Our graduates are far from ordinary.  
**But we expect them to be extraordinary.**



**Susan Solomon** (Chemistry '77)—Co-chair of the Intergovernmental Panel on Climate Change that received the 2007 Nobel Peace Prize



**Vincent Rotello** (Chemistry '85)—Professor in Chemistry at the University of Massachusetts Amherst, where he researches sensors, materials, and drug delivery



**Giang Vo** (Chemistry '05)—Senior research investigator at DuPont, where he is conducting research used in displays, lighting, and smart materials applications