



College of
Science

Southern Illinois University Carbondale

Chemistry and Biochemistry

American Chemical Society Certification

Biochemistry, Business, Environmental and Forensic Chemistry

College of Science

What can I Study?

Chemistry is the study of matter.

What are the components of any material? Molecules, atoms, protons, neutrons, electrons and photons are all subjects of study in chemistry. How do these components interact? Explosions, fires, rust, effervescence, fluorescence, phosphorescence, nuclear fusion, ferromagnetism, piezoelectricity and photovoltaics provide examples of chemical reactions or processes, which change the properties of matter.

Biochemistry focuses on the chemistry of life. What are the molecules inside our cells? Proteins, carbohydrates, lipids and nucleic acids are the building blocks of life. How do living systems obtain energy from their surroundings? How do cells use molecules to grow and multiply? How do living organisms respond to changes in their environment?

The Department offers a program in Comprehensive Chemistry leading to a B.S. degree and additional degree tracks in Biochemistry for pre-professional students, Business for students continuing into an M.B.A. program, Environmental Chemistry with interdisciplinary studies in engineering, soil science or related areas, and Forensic Chemistry with supporting courses in Anthropology and Criminal Justice. Certification from the American Chemical Society is readily available to qualified students participating in Undergraduate Research. There are numerous opportunities for students to join a research lab as an undergraduate and get a real hands-on experience in cutting edge research.

What Facilities are available at SIUC?

The Chemistry Computer Labs allow students to participate in classroom instruction, run molecular simulations and analyze spectroscopic data provided by the practical laboratory courses.

The NMR Facility gives students and faculty access to 3 NMR spectrometers including a Varian Inova 300 MHz with a new solid state probe for materials science research, an actively shielded Varian Mercury plus 400 MHz with a multinuclear probe for small molecule characterization and a Varian Inova 500 MHz with a triple resonance gradient probe for biomolecular structural studies.

The IMAGE Facility provides access to atomic force, electron and light microscopes for advanced imaging of materials and biological specimens. Additional assistance in computer graphic imaging is available to prepare stunning illustrations for reports.

The Mass Spectrometry Facility provides sample analysis and training for GC-MS, MALDI-TOF and electrospray mass spectrometers with applications in characterization of volatile compounds, peptide analysis, protein sequencing and proteomic mapping.

What Organizations can I join?

The Alpha Chi Sigma fraternity provides social opportunities as well as academic support to members of the local Beta Psi chapter at SIUC.

The Student Affiliates of the American Chemical Society introduces students to the leading national professional society for both the academic and industrial areas of Chemistry.

What are my Career Opportunities?

Chemistry is an excellent foundation for any scientific, professional or business career, including agriculture, chemical engineering, dentistry, energy, environmental chemistry, forensics, geochemistry, medicine, nanotechnology, ophthalmology, patent law, pharmacology, polymer chemistry, space exploration, synthetic organic chemistry, toxicology and veterinary science.

Who are the Faculty?

Mark Bausch, PhD, Northwestern University, Physical Organic Chemistry.
Bakul Dave, PhD, Houston University, Inorganic Chemistry, Materials Science.
Daniel Dyer, PhD, University of Colorado at Boulder, Organic Chemistry, Polymer Chemistry, Materials Science.
Yong Gao, PhD, University of Alberta, Organic Chemistry, Materials Science.
Qingfeng Ge, PhD, Tianjin University, Physical, Computational and Theoretical Chemistry.
Boyd Goodson, PhD, University of California at Berkeley, Physical Chemistry, Materials Science, NMR Spectroscopy.
Kara Huff-Hartz, PhD, Purdue University, Analytical and Environmental Chemistry.
Gary Kinsel, PhD, University of Colorado at Boulder, *Department Chair*, Analytical Chemistry, Mass Spectrometry.
Punit Kohli, PhD, Michigan State University, Analytical Chemistry, Materials Science.
John Koropchak, PhD, University of Georgia, *Vice Chancellor of Research*, Analytical Chemistry, Aerosol Chromatography.
Brian Lee, PhD, University of Maryland, Biochemistry at Baltimore, Biochemistry, NMR Spectroscopy, Molecular Biology.
Matthew McCarroll, PhD, University of Idaho, Analytical Chemistry, Fluorescence.
Jay Means, PhD, University of Illinois at Urbana-Champaign, *Dean of the College of Science*, Biochemistry, Environmental Chemistry, Toxicology, Pharmacology.
Gabriela Pérez-Alvarado, PhD, University of Maryland at Baltimore, Biochemistry, Biophysics, NMR Spectroscopy.
Luke Tolley, PhD, University of North Carolina Chapel Hill, Analytical & Forensic Chemistry.
Lichang Wang, PhD, University of Copenhagen, Physical Chemistry, Computational and Theoretical Chemistry.

How do I get more information?

For more information, please visit our website at <http://www.chem.siu.edu>.

For a tour of our facilities and advice on courses that meet your goals, contact: Undergraduate Advisors
Dept. of Chemistry and Biochemistry
Neckers Hall, Rm 224, Mailcode 4409
Southern Illinois University
Carbondale, Illinois 62901

Department of Chemistry and Biochemistry – Degree Tracks
College of Science - Bachelor of Science Degree and Bachelor of Arts Degree

***New* Comprehensive Chemistry B.S. Degree Track for all Students**

<i>First Year</i>	<i>Fall</i>	<i>Spring</i>
CHEM 200/201, 210/211 General Chemistry and Lab	4	4
MATH 108, 109 Algebra and Trig. Geometry	3	3
ENGL 101, 102 English Composition	3	3
Biological Science and UCC Health Electives	3	2
CI 199 Library and SPCM 101 Speech	1	3

Second Year

CHEM 230 Quantitative Analysis	4	-
CHEM 340/341, 342/343 Organic Chemistry and Lab	5	5
MATH 150, 250 Calculus I and II	4	4
PHYS 205a, 255a Physics and Lab	-	4
UCC Humanities Electives	3	3

Third Year

CHEM 350, 351 Biochemistry and Lab	-	5
CHEM 434 Instrumental Analysis	4	-
CHEM 462, 466a Physical Chemistry and Lab	-	4
MATH 483 Statistics and Supportive Skills Elective	4	3
PHYS 205b, 255b Physics and Lab	4	-
UCC Social Science Electives	3	3

Fourth Year

CHEM 410, 411 Inorganic Chemistry and Lab	-	5
CHEM 461, 466b Physical Chemistry and Lab	4	-
CHEM 490, 396 Senior Seminar and Research Chemistry Elective and Select Electives	2	1
UCC Fine Arts Electives	3	-
UCC Multicultural and Interdisciplinary Electives	3	3

Pre-Professional Student, Biochemistry Specialization

<i>First Year</i>	<i>Fall</i>	<i>Spring</i>
BIOL 200a,b Biology and Lab	3	3
CHEM 200/201, 210/211 General Chemistry and Lab	4	4
MATH 108, 109 Algebra and Trig. Geometry	3	3
ENGL 101, 102 English Composition	3	3
PSYC 102 Psychology and PHIL 105 Logic	3	3

Second Year

CHEM 230 Quantitative Analysis	4	-
CHEM 340/341, 342/343 Organic Chemistry and Lab	5	5
MATH 150, 250 Calculus I and II	4	4
MICR 301 Microbiology and Lab	4	-
PHYS 205a, 255a Physics and Lab	-	4
SPCM 101 Speech	-	3

Third Year

BIOL 305 Genetics	3	-
CHEM 350, 351 Biochemistry and Lab	-	5
MATH 483 Statistics	-	4
PHYS 205b, 355b Physics and Lab	4	-
PHSL 310, 301 Physiology and Anatomy	5	4
ENGL 290 Analytical Writing and SOC 108 Sociology	3	3
HCP 105 Medical Term. and SCI 201 Career Prep	2	1

Fourth Year

CHEM 410, 411 Inorganic Chemistry and Lab	-	5
CHEM 462, 466a Physical Chemistry and Lab	-	4
CHEM 490, 396 Senior Seminar and Research Select Electives	2	1
UCC Humanities and Fine Arts Electives	6	-
UCC Humanities Electives	3	3
UCC Multicultural and Interdisciplinary Electives	3	3

Forensic Chemistry B.S. Degree Track with Forensic Science Minor

<i>Second Year</i>		
CHEM 230 Quantitative Analysis	4	-
CHEM 273 Forensic Science & AJ 201 Criminal Justice	3	3
CHEM 340/341, 342/343 Organic Chemistry and Lab	5	5
MATH 150, 250 Calculus I and II	4	4
PHYS 205a, 255a Physics and Lab	-	4

Third Year

ANTH 231 Forensic Anthropology	-	3
CHEM 350, 351 Biochemistry and Lab	-	5
CHEM 434, 439 Instrumental and Forensic Chemistry	4	3
CHEM 462, 466a Physical Chemistry and Lab	-	4
PHYS 205b, 255b Physics and Lab	4	-
PHIL 104 Ethics and UCC Humanities Elective	6	-

Fourth Year

CHEM 410, 411 Inorganic Chemistry and Lab	-	5
CHEM 490, 396 Senior Seminar and Research	2	1
MATH 483 Statistics and Supportive Skills Elective	3	3
UCC Fine Arts and Social Science Electives	6	3
UCC Multicultural and Interdisciplinary Electives	3	3

Environmental Chemistry B.S. Degree Track with Plant & Soil Minor

Third Year

CHEM 350, 351 Biochemistry and Lab	-	5
CHEM 434, 431 Instrumental and Environmental	4	3
CHEM 462, 466a Physical Chemistry and Lab	-	4
PHYS 205b, 355b Physics and Lab	4	-
PLSS 240 Soil Science	4	-
UCC Social Science Electives	3	3

Fourth Year

CHEM 410, 411 Inorganic Chemistry and Lab	-	5
PLSS 446 Soil and Water Conservation	3	-
PLSS 454 Soil Microbes	4	-
PLSS 447/448 Fertilizers and Soil Fertility Lab	-	5
MATH 483 Statistics and Supportive Skills Elective	3	3
UCC Fine Arts Elective	3	-
UCC Multicultural and Interdisciplinary Electives	3	3

Business Chemistry B.A. Degree Track with Business Minor

Second Year

ACCT 220, 230 Accounting I and II	3	3
CHEM 230 Quantitative Analysis	4	-
CHEM 340/341, 342/343 Organic Chemistry and Lab	5	5
MATH 150, 250 Calculus I and II	4	4
PHYS 205a, 255a Physics and Lab	-	4

Third Year

CHEM 350, 351 Biochemistry and Lab	-	5
CHEM 462, 466a Physical Chemistry and Lab	-	4
ECON 240, 241 Microeconomics & Macroeconomics	3	3
MGMT 208 Data Analysis and FIN 330 Finance	3	3
PHYS 205b, 355b Physics and Lab	4	-
ENGL 291 Writing, CS 201 Computers, BUS 302 Career	6	1

Fourth Year

CHEM 410, 411 Inorganic Chemistry and Lab	-	5
MGMT 304 Management & MKTG 304 Marketing	3	3
UCC Social Science and Fine Arts Electives	6	-
UCC Humanities Electives	3	3
UCC Multicultural and Interdisciplinary Electives	3	3