

CHEMISTRY, BS

for the degree of Bachelor of Science in Chemistry (Specialized Curriculum)

Chemistry is the study of matter at the molecular level. Professional chemists

- make new compounds, like pharmaceuticals,
- develop new ways to measure chemical reactions at the limits of space and time, and
- create new theoretical frameworks to understand and predict molecular behavior.

Through classwork and hands-on laboratory learning, you'll develop the skills to tackle a variety of technical problems in environments that range from the chemical industry to aerospace. You'll also have the opportunity to join research labs and take part in internships at various companies.

When you apply, you can choose to apply to either

- Chemistry BS: Bachelor of Science in Chemistry (Specialized Curriculum), or
- Chemistry BSLAS: Bachelor of Science in Liberal Arts and Sciences Major in Chemistry.

The Chemistry BS degree program provides a rigorous and research-oriented foundation in chemistry through advanced, specialized coursework in chemistry, physics, and mathematics; in-depth exposure to subareas of chemistry, such as analytical, inorganic, organic, and physical chemistry; and mastery of laboratory techniques and scientific instrumentation required for chemical research. The Chemistry BS degree is certified by the American Chemical Society. It is intended for students wishing to pursue a career, research, or graduate studies in the chemical sciences.

Undergraduate Degree Programs in Chemistry

For the Degree of Bachelor of Science in Liberal Arts and Sciences

- Major in Computer Science & Chemistry (Sciences and Letters) (http://catalog.illinois.edu/undergraduate/eng_las/computer-science-chemistry-bslas/)
- Major in Chemistry (Sciences and Letters) (<http://catalog.illinois.edu/undergraduate/las/chemistry-bslas/>)

For the Degree of Bachelor of Science in Chemistry

- Major in Chemistry (Specialized Curriculum) (p. 1)
- Major in Chemistry (Specialized Curriculum), Environmental Chemistry Concentration (<http://catalog.illinois.edu/undergraduate/las/chemistry-bs/environmental-chemistry/>)

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Specialized Curriculum

Graduation requires grade point averages of at least 2.0 overall and 2.0 in chemistry, mathematics, and physics courses.

Students in the Specialized Curriculum in Chemistry must include a course in Biochemistry in the Advanced Chemistry area or the Technical Electives area to be certified by the American Chemical Society as having met its specifications.

Departmental distinction: Students qualify for graduation with distinction by exhibiting superior performance in both course work and in senior thesis research. To be eligible, a student must have a Illinois coursework major grade point average of 3.25, must take CHEM 499 (normally for two semesters) and submit a senior thesis for evaluation, and must have their undergraduate research advisor submit to the department Head a letter of support attesting to the effort invested by the student. The minimum major GPAs for Distinction, High Distinction, and Highest Distinction are 3.25, 3.5, and 3.75, respectively. Final decisions on awarding Distinction honors will be made by the Head or designee.

Graduation Requirements

Minimum hours required for graduation: 120 hours.

University Requirements

Minimum of 40 hours of upper-division coursework, generally at the 300- or 400-level. These hours can be drawn from all elements of the degree. Students should consult their academic advisor for additional guidance in fulfilling this requirement.

The university and residency requirements can be found in the Student Code (<https://studentcode.illinois.edu/article3/part8/3-801/>) (§ 3-801) and in the Academic Catalog (<http://catalog.illinois.edu/general-information/degree-general-education-requirements/>).

General Education Requirements

Follows the campus General Education (Gen Ed) requirements (<https://courses.illinois.edu/gened/DEFAULT/DEFAULT/>). Some Gen Ed requirements may be met by courses required and/or electives in the program.

Code	Title	Hours
	Composition I	4-6
	Advanced Composition	3
	Humanities & the Arts (6 hours)	6
	Natural Sciences & Technology (6 hours)	6
	fulfilled by CHEM 202 & CHEM 204 or CHEM 102 & CHEM 104; PHYS 211, PHYS 212	
	Social & Behavioral Sciences (6 hours)	6
	Cultural Studies: Non-Western Cultures (1 course)	3
	Cultural Studies: US Minority Cultures (1 course)	3
	Cultural Studies: Western/Comparative Cultures (1 course)	3
	Quantitative Reasoning (2 courses, at least one course must be Quantitative Reasoning I)	6-10
	fulfilled by MATH 220 or MATH 221, MATH 231, MATH 241; PHYS 211, PHYS 212	
	Language Requirement (Completion of the third semester or equivalent of a language other than English is required)	0-15

Code	Title	Hours
Orientation and Professional Development		
LAS 101	Design Your First Year Experience	1
OR		
LAS 100 & LAS 101	Success in LAS for International Students and Design Your First Year Experience	3
OR		
LAS 102	Transfer Advantage	1
Total Hours		1 or 3

Code	Title	Hours
Major Core Requirements and Electives		

Core Chemistry	37
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CHEM 150	First Semester Success in Chemistry (Transfer students may substitute 1 hour of 200 level or higher Chemistry, including CHEM 297, CHEM 397, CHEM 497, or CHEM 499, for the 1 hour of CHEM 150. This may not include CHEM 222 or CHEM 223 for students who took the CHEM 102, CHEM 103, CHEM 104, and CHEM 105 sequence instead of CHEM 202, CHEM 203, CHEM 204, and CHEM 205.)	
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CHEM 202	Accelerated Chemistry I	
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CHEM 203	Accelerated Chemistry Lab I	
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CHEM 204	Accelerated Chemistry II	
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CHEM 205	Accelerated Chemistry Lab II	
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If necessary, CHEM 102, CHEM 103, CHEM 104, CHEM 105, CHEM 222, and CHEM 223 may be substituted for CHEM 202, CHEM 203, CHEM 204, and CHEM 205.

CHEM 236	Fundamental Organic Chem I	
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CHEM 237	Structure and Synthesis	
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CHEM 312	Inorganic Chemistry	
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CHEM 315	Instrumental Chem Systems Lab	
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CHEM 420	Instrumental Characterization	
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CHEM 436	Fundamental Organic Chem II	
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CHEM 442	Physical Chemistry I	
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CHEM 444	Physical Chemistry II	
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CHEM 445	Physical Principles Lab I	
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Advanced Chemistry	11
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CHEM or BIOC courses numbered 300 or higher, which must include three laboratory courses from the following:

CHEM 317	Inorganic Chemistry Lab	
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CHEM 437	Organic Chemistry Lab	
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CHEM 447	Physical Principles Lab II	
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CHEM 483	Solid State Structural Anlys	
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BIOC 455	Technqs Biochem & Biotech	
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A student who has earned at least 6 credit hours in any combination of CHEM 397, CHEM 497, or CHEM 499 must complete only two laboratory courses from the list, one of which must be CHEM 317, CHEM 437, or CHEM 447.

Mathematics	16-19
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MATH 220	Calculus	
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or MATH 221	Calculus I	
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MATH 225	Introductory Matrix Theory	
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or MATH 227	Linear Algebra for Data Science	
or MATH 257	Linear Algebra with Computational Applications	
or MATH 415	Applied Linear Algebra	

MATH 231	Calculus II	
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MATH 241	Calculus III	
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MATH 285	Intro Differential Equations	
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Physics	10
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PHYS 211	University Physics: Mechanics	
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PHYS 212	University Physics: Elec & Mag	
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PHYS 214	Univ Physics: Quantum Physics	
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Technical Electives	7-9
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CHEM (300 or higher), BIOC, CHBE (200 or higher)

Courses in life sciences (all courses at 200 or higher)

Mathematics or computer science above the basic level

Other courses in the physical and biological sciences and engineering including CHEM 199 (Three hours maximum credit in CHEM 199. Additional courses in sciences and engineering can be taken, upon consultation with the SCS advisor and approval from the chemistry department. Approved courses must generally have a strong technical prerequisite, such as one year of college-level math or science.)

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Sample Sequence

This sample sequence is intended to be used only as a guide for degree completion. All students should work individually with their academic advisors to decide the actual course selection and sequence that works best for them based on their academic preparation and goals. Enrichment programming such as study abroad, minors, internships, and so on may impact the structure of this four-year plan. Course availability is not guaranteed during the semester indicated in the sample sequence.

Students must fulfill their Language Other Than English requirement by successfully completing a third level of a language other than English. See the corresponding section on the Degree and General Education Requirements page (<http://catalog.illinois.edu/general-information/degree-general-education-requirements/>).

First Year

First Semester	Hours
LAS 101	1
CHEM 150	1
CHEM 202	3
CHEM 203	2
MATH 220 or 221	4
Language Other Than English (3rd level) or Composition I	4
Total Hours	15

Total Hours 15

First Year

Second Semester	Hours
CHEM 204	3
CHEM 205	2

MATH 231	3
PHYS 211	4
Composition I or Language Other Than English (3rd level)	4
	16

Total Hours 16**Second Year****First Semester****Hours**

CHEM 236	4
CHEM 237	2
PHYS 212	4
MATH 241	4
General Education course	3
	17

Total Hours 17**Second Year****Second Semester****Hours**

CHEM 436	3
Advanced Chemistry course (Lab)	3
PHYS 214	2
MATH 225, 227, 257, or 415	3
MATH 285	3
General Education course	3
	17

Total Hours 17**Third Year****First Semester****Hours**

CHEM 442	4
CHEM 420	2
CHEM 315	2
General Education course	3
General Education course	3
	14

Total Hours 14**Third Year****Second Semester****Hours**

CHEM 444	4
CHEM 445	2
CHEM 312	3
General Education course	3
General Education course	3
	15

Total Hours 15**Fourth Year****First Semester****Hours**

Advanced Chemistry course	3
Advanced Chemistry course (Lab)	3
Technical Electives	5

General Education course	3
	14

Total Hours 14**Fourth Year****Second Semester****Hours**

Advanced Chemistry course (Lab)	2
Technical Elective	3
General Education course	3
Free Elective course	3
Free Elective course	1
	12

Total Hours 12**Total Hours: 120**

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Students graduating with the BS in Chemistry will have:

1. A thorough knowledge of the basic principles of chemistry, including atomic and molecular structure, chemical dynamics and the chemical and physical properties of substances.
2. An exposure to the subfields of chemistry, such as analytical, organic, physical, materials, inorganic, as well as chemical biology.
3. The ability to read, evaluate, interpret, and present (via oral and written communication) numerical, chemical and general scientific data, information and literature.
4. The ability to carry out experiments, use appropriate experimental apparatus effectively, and demonstrate proper laboratory safety skills.

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Chemistry

Chemistry website (<https://chemistry.illinois.edu>)

Chemistry Faculty (<https://chemistry.illinois.edu/directory/faculty-by-type/>)

SCS Academic Advising (<https://scs.illinois.edu/alumni-students/advising/>)

College of Liberal Arts & Sciences

Liberal Arts & Sciences College & Admissions requirements (<http://catalog.illinois.edu/schools/las/>)

LAS website (<https://las.illinois.edu/>)