

Bachelor of Science (BS)

Chemistry is the branch of natural science that deals with the properties and classification of matter, the changes that matter undergoes and the energy associated with these changes. Chemists study substances at the atomic and molecular level and how different substances interact with each other. Research by chemists increases our knowledge about chemicals and their roles in the natural world and has led to the discovery and development of new and improved products and advances in medicine, agriculture, food processing and many other fields. Chemists are employed by industry, government, academia, non-profits and in the entrepreneurship sector. Those interested in a challenging and rewarding career that provides financial security, promotes self-respect and offers the opportunity to work on stimulating and breakthrough projects should consider a career in chemistry.

Becoming Career Ready...

/ Faculty-mentored research and guidance will help you develop the professional skills needed for success in a competitive job market and/or advanced study in graduate and professional programs.

/ Upon graduation, Comprehensive Chemistry graduates will be prepared to enter the workforce as a chemist in a variety of fields, such as biotechnology, chemical and pharmaceutical manufacturing, product development, quality control, sales (pharmaceuticals, chemicals, instruments), computational chemistry, chemical safety and hygiene, hazardous waste management, environmental protection, cheminformatics and technical writing, to name a few. The Computational Chemistry curriculum provides an excellent basis for graduate and professional areas of study.

/ 100% of Southeast programs offer real-world experience. Computational Chemistry students may earn this experience through undergraduate research or an internship.

/ Completion of the ACS Certified Chemistry track will satisfy the requirements for certification to the American Chemical Society (ACS), which represents the minimum undergraduate preparation recommended by the ACS for the professional chemist.

/ Computational Chemistry students will study in the state-of-the-art, first-rate learning environment provided by the recently renovated Magill Hall of Science while gaining hands-on experience and training using a variety of lab equipment, chemical instruments and tools in laboratory courses and undergraduate research.

/ The path to a successful career starts with you! You can maximize your career development by working closely with Career Services and Southeast faculty – they are here to help you connect your passions, interests and skills to jobs and opportunities in the field. Career Services provides professional career counseling and coaching, resume critiques, practice interviews, job search strategies, career events, networking opportunities and more.

Internships, Employment Opportunities, Graduate Schools and Programs of Recent Graduates:

- Biokyowa
- Buzzi Unicem USA
- Eli Lilly
- Exxon Mobil
- Monsanto
- Pharmacia (currently part of Pfizer)
- PPG Industries
- Proctor and Gamble
- MilliporeSigma
- Missouri State Highway Patrol Crime laboratory
- Indiana University
- John Hopkins University
- Penn State University
- Purdue University
- Southern Illinois University (School of Medicine)
- Texas A & M
- University of Illinois (School of Medicine, Graduate School)
- University of Missouri – Columbia (School of Medicine, Graduate School)
- University of Notre Dame
- University of Wisconsin – Madison
- Washington University
- Numerous other graduate/professional programs of study and employers

Special Options with Chemistry

Southeast offers a Master of Natural Science in Applied Chemistry.

Career Information

To learn more about career opportunities in chemistry visit:
<https://www.acs.org/content/acs/en/careers/college-to-career.html>.

According to the United States Bureau of Labor Statistics, there were 96200 chemistry related jobs in 2016. This number is expected to increase by 7% by 2026. Source:
<https://www.bls.gov/ooh/life-physical-and-social-science/chemists-and-materials-scientists.htm>.

Transfer and Dual Credit Students

If you have dual credit or transfer credit, please visit our transfer course equivalencies guide at semo.edu/transfercredit.

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This is a guide based on the 2021-2022 Undergraduate Bulletin and is subject to change. The time it takes to earn a degree will vary based on several factors such as dual enrollment, remediation, and summer enrollment. Students will meet with an academic advisor each semester and use Degree Works to monitor their individual progress.

CURRICULUM CHECKLIST

"Critical Courses" are italicized and bolded. Data shows that students who have completed this course in the first two years and have earned the noted grade are most likely to complete this program of study.

Chemistry: Comprehensive Chemistry option – 83-87
hours required – no minor required
Required Courses:

- ___ **CH 184 General Chemistry I Lab (1)**
- ___ **CH 185 General Chemistry I (3)**
- ___ **CH 186 General Chemistry II (3)**
- ___ CH 187 General Chemistry II Lab (1)
- ___ CH 195 Chemistry Seminar I (1)
- ___ CH 271 Foundations of Analytical Chemistry (5)
- ___ CH 295 Chemistry Seminar 2 (2)
- ___ CH 306 Inorganic Chemistry (3)
- ___ CH 341 Found of Organic Chem (4)
- ___ CH 342 Organic Chemistry Lab I (1)
- ___ CH 495 Chemistry Seminar 3 (1)
- ___ CH 531 Found of Biochemistry (3)

COMPREHENSIVE CHEMISTRY OPTION

- ___ CH 343 Advanced Organic Chemistry (3)
- ___ CH Electives (300 level or higher): 3-4

Choose One of the Following Tracks:**American Chemical Society Certified Track**

- ___ CH 311 Foundations of Physical Chemistry (4)
- ___ CH 312 Advanced Physical Chemistry (3)
- ___ CH 313 Physical Chemistry Laboratory (3)
- ___ CH 344 Organic Chemistry Laboratory II (2)
- ___ CH 391 Undergraduate Research (1)*
- ___ CH 532 Advanced Biochemistry (2)
- ___ CH 563 Advanced Inorganic Chemistry (5)
- ___ CH 575 Chemical Instrumentation (4)

Additional Requirements

- ___ MA 140 Analytic Geometry & Calculus I (5)
- ___ MA 145 Analytic Geometry & Calculus II (4)
- ___ PH 230 General Physics I (3)
- ___ PH 231 General Physics II (3)
- ___ PH 232 General Physics I Experimental & Computational Laboratory (2)
- ___ PH 233 General Physics II Experimental & Computational Laboratory (2)

Computational Chemistry Track

- ___ CH 412 Computational Chemistry (3)
- ___ CS 155 Computer Science I (4)
- ___ CS 265 Computer Science II (4)
- ___ CS 351 C & the POSIX Environment (4)
- ___ CS 503 Fundamentals of Computing (3)
- ___ CS xxx 400-level elective (3)

Choose one course:

- ___ CH 311 Foundations of Physical Chemistry (4)
- ___ CH 312 Advanced Physical Chemistry (3)

Choose one course:

- ___ CS 101 Introduction to Computer Programming (3)
- ___ CS 177 Programming for Scientists & Engineers (3)

Choose one course:

- ___ CS 433 Introduction to Data Analytics (3)
- ___ CS 445 Software Engineering I (3)

Major requirements - continued**Additional Requirements**

- ___ MA 140 Analytic Geometry & Calculus I (5)
- ___ MA 145 Analytic Geometry & Calculus II (4)
- ___ PH 230 General Physics I (3)
- ___ PH 231 General Physics II (3)
- ___ PH 232 General Physics I Experimental & Computational Laboratory (2)
- ___ PH 233 General Physics II Experimental & Computational Laboratory (2)

Choose one course:

- ___ MA 345 Linear Algebra (3)
- ___ MA 350 Differential Equations I (3)

Foundational Chemistry Track

- ___ CH344 Organic Chemistry Laboratory II (2)
- ___ Choose 9 hours of CH Electives (300-500 level) (9)

Choose one course:

- ___ CH 311 Foundations of Physical Chemistry (4)
- ___ CH 312 Advanced Physical Chemistry (3)
- ___ CH 575 Chemical Instrumentation (4)

Additional requirements:**Mathematics – 5-6 hours**

- ___ MA 140 Analytic Geometry & Calculus I (5)
- OR
- ___ MA 139 Applied Calculus (3)
- AND
- ___ MA 223 Elementary Probability and Statistics (3)
- OR
- ___ MA 345 Linear Algebra (3)
- OR
- ___ CS 101 Introduction to Computer Programming (3)

Physics – 10 hours

- ___ PH 120 Introductory Physics I (5)
- AND
- ___ PH 121 Introductory Physics II (5)
- OR
- ___ PH 230 General Physics I (3)/PH 232 General Physics I Experimental & Computational Laboratory (2)
- AND
- ___ PH 231 General Physics II (3)/PH 233 General Physics II Experimental & Computational Laboratory (2)

*Note: Completion of undergraduate research in the major is required. The departmental advisor should be consulted for information about this requirement.

General Education Requirements – some requirements may be fulfilled by coursework in major program

- Social and Behavioral Sciences – 6 hours
- Constitution Requirement – 3 hours
- Written Communication – 6 hours
- Oral Communication – 3 hours
- Natural Sciences – 7 hours (from two disciplines, one to include a lab)
- Mathematics – 3 hours
- Humanities & Fine Arts – 9 hours (from at least two disciplines)
- Additional requirements – 5 hours (to include UI100 for native students)
- Civics examination

Bachelor of Science (BS)**SAMPLE FOUR-YEAR PLAN**

	Fall Semester		Spring Semester	
	Course #	Hrs	Course #	Hrs
FIRST YEAR	UI100	1	CH186	3
	EN100	3	CH187	1
	CH184	1	CH195	1
	CH185	3	Track course	3-4
	Required Math course	3-5	General Education	3
	General Education	3	General Education	3
	Total	14-16	Total	15-16
Milestone: maintain 2.0 cumulative GPA				
SECOND YEAR	CH271/071	5	CH295	2
	CH341	4	CH343	3
	CH342	1	Required Physics course	5
	Required Physics course	5	Track course	2-4
			General Education	3
	Total	15	Total	15-17
Milestone: maintain 2.0 cumulative GPA				
<i>(summer courses are encouraged to avoid 18 hour semesters)</i>				
THIRD YEAR	CH306	3	Track course	3-4
	Track course	3-4	Track course	3-4
	Track course	3-4	Track course or Elective	3-4
	General Education	3	General Education	3
	General Education	3	General Education	3
	Total	15-17	Total	15-18
Milestone: maintain 2.0 cumulative GPA				
FOURTH YEAR	CH531	3	CH495	1
	General Education	3	Chemistry Electives	3-4
	Track course or Elective	3-4	Track course or Elective	3-4
	Track course or Elective	3-4	Track course or Elective	3-4
	Track course or Elective	3-4	Track course or Elective	3-4
	Total	15-18	Total	13-17
Milestone: maintain 2.0 cumulative GPA				

A "Milestone" signifies a significant stage for a student in the completion of a degree.

Degree requirements for all students: a minimum of 120 credit hours, completion of the General Education program, and completion of 39 senior division hours (300-599). Refer to the Undergraduate Bulletin or Degree Works for additional graduation requirements for your program.

A minimum 2.0 GPA in the major and overall are required to graduate with a BS degree.

To learn more
 Office of Admissions
 (573) 651-2590
admissions@semo.edu
semo.edu

To explore
 the College of Science,
 Technology, Engineering and
 Mathematics online, visit
semo.edu/stem

For advising
 Center for Academic Advising
semo.edu/advising