

# Chemistry: ACS Certified Chemistry Option

## Bachelor of Science (BS)

# ACS Certified Chemistry Option

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. 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 other fields. Those interested in a 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.



This degree option satisfies the requirements for certification to the American Chemical Society (ACS), and as such represents the minimum undergraduate preparation recommended by the ACS for the professional chemist. The chemistry curriculum prepares students for careers as professional chemists and provides an excellent basis for graduate and professional areas of study.

### Chemistry students will...

- Gain a rigorous foundation in chemistry, science and math in the context of a broad university education.
- Interact closely with experienced faculty who are recognized for their writing, training, professional affiliations, and expertise.
- Study in the state-of-the-art, first-rate learning environment provided by the newly renovated Magill Hall of Science.
- Have opportunities to pursue research and scholarship that help develop independent thinking and problem solving.
- Have employment opportunities within the department that can provide chemistry-related work experience prior to graduation.

### Career Planning

Career preparation is part of the mission of Southeast. 100% of programs offer our students an internship, study-abroad program, clinical opportunity, student teaching or research internship.

Approximately 35-40% of chemistry graduates pursue graduate or professional programs of study immediately upon graduation. The others pursue employment opportunities in chemistry or other fields. Employment opportunities for chemists exist in a variety of fields, such as biotechnology, biochemistry, chemical manufacturing, environmental monitoring and compliance, industrial hygiene, materials science, pharmaceutical manufacturing, product development, quality control, sales (pharmaceuticals, chemicals, instruments), and technical management.

The Office of Career Services in Academic Hall 057 can provide students with professional career counseling and coaching, resume critiques, practice interviews, job search strategies, career events, networking opportunities, and more.

Demonstrated Career Proficiency is a Requirement of all Southeast Students		
CL001	First Semester	Students connect academic career planning by completing an online career assessment
CL002	Second Semester	Students learn more about resources available to enhance academic and career planning
CL003	Junior Year	Students learn about continued career planning, job search strategies, and networking
CL004	Senior Year	Students learn about resume development, professional communication, interviewing, and transitioning to the first job from college

### 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
- Sigma-Aldrich
- 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.

**To learn more**  
 Office of Admissions  
 (573) 651-2590  
[admissions@semo.edu](mailto:admissions@semo.edu)  
[www.semo.edu](http://www.semo.edu)

**To explore the College of Science, Technology, and Agriculture online, visit**  
[www.semo.edu/costa](http://www.semo.edu/costa)

**For advising**  
 Center for Academic Advising - North  
 (573) 651-5090  
[www.semo.edu/advising](http://www.semo.edu/advising)  
[advisingnorth@semo.edu](mailto:advisingnorth@semo.edu)

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This is a guide based on the 2017-2018 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 DegreeWorks 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.*

#### Required Courses:

- \_\_\_ **CH185** *General Chemistry (5)*
- \_\_\_ **CH186** *Foundations of Inorganic Chemistry (3)*
- \_\_\_ CH187 Inorganic Chemistry & Qualitative Analysis Laboratory (2)
- \_\_\_ CH271 Foundations of Analytical Chemistry (5)
- \_\_\_ CH311 Foundations of Physical Chemistry (4)
- \_\_\_ CH312 Advanced Physical Chemistry (3)
- \_\_\_ CH313 Physical Chemistry Laboratory (3)
- \_\_\_ **CH341** *Foundations of Organic Chemistry (4)*
- \_\_\_ CH342 Organic Chemistry Laboratory I (1)
- \_\_\_ CH343 Advanced Organic Chemistry (3)
- \_\_\_ CH344 Organic Chemistry Laboratory II (2)
- \_\_\_ CH498 Professional Presentation in Chemistry (1)
- \_\_\_ CH531 Foundations of Biochemistry (3)
- OR
- \_\_\_ UI331 Foundations of Biochemistry (3)
- \_\_\_ UI443 Professional Experience in Chemistry (3)

#### Chemistry Electives – Choose one seven to eight hour track

##### Track A:

- \_\_\_ CH39X Undergraduate Research (4)
- Choose 4 hours from:
- \_\_\_ CH532/533 Advanced Biochemistry Lecture and Lab (2+2)
- \_\_\_ CH563 Advanced Inorganic Chemistry (4)
- \_\_\_ CH575 Chemical Instrumentation (4)

##### Track B:

- Choose two of the following to include a minimum of 3 hours of lab work:
- \_\_\_ CH420 Forensic Chemistry (4)
- \_\_\_ CH447 Advanced 1 & 2 Dimensional NMR Techniques (3)
- \_\_\_ CH450 Environmental Chemistry (3)
- \_\_\_ CH532/533 Advanced Biochemistry Lecture and Lab (2+2)
- \_\_\_ CH545 Organic Preparations and Characterization (3)
- \_\_\_ CH563 Advanced Inorganic Chemistry (4)
- \_\_\_ CH575 Chemical Instrumentation (4)

#### Additional Requirements:

- \_\_\_ **MA140** *Analytical Geometry and Calculus I (5)*
- \_\_\_ MA145 Analytical Geometry and Calculus II (4)
- \_\_\_ PH120/020 Introductory Physics I (5)
- AND
- \_\_\_ PH121/021 Introductory Physics II (5)
- OR
- \_\_\_ PH230/030 General Physics I (5)
- AND
- \_\_\_ PH231/031 General Physics II (5)

Note: Completion of an experiential learning project (undergraduate research or internship) in the major is required. The departmental advisor should be consulted for information about this requirement.

#### University Studies Requirements (not already listed above):

UI100 First Year Seminar, EN100 English Composition, Artistic Expression, Written Expression, Oral Expression, Literary Expression, Behavioral Systems, Living Systems, Development of a Major Civilization, Economic Systems, Political Systems, Social Systems

If you have dual credit or transfer credit, please visit our transfer course equivalencies guide at [semo.edu/transfercredit](http://semo.edu/transfercredit).

### SAMPLE FOUR-YEAR PLAN

	Fall Semester		Spring Semester	
	Course #	Hrs	Course #	Hrs
<b>FIRST YEAR</b>	UI100	3	<b>CH186</b>	3
	EN100	3	CH187	2
	<b>CH185/CH085/CH005</b>	5	MA145	4
	<b>MA140</b>	5	Social Systems	3
			Written Expression	3
<b>Total</b>	<b>16</b>	<b>Total</b>	<b>15</b>	
Milestone: maintain 2.0 cumulative GPA				
<b>SECOND YEAR</b>	CH271	5	CH343	3
	<b>CH341</b>	4	CH344	2
	CH342	1	PH121/021 or PH 231/031	5
	PH120/020 or PH230/230	5	Artistic Expression	3
			Oral Expression	3
<b>Total</b>	<b>15</b>	<b>Total</b>	<b>16</b>	
Milestone: maintain 2.0 cumulative GPA				
<i>(summer courses are encouraged to avoid 18 hour semesters)</i>				
<b>THIRD YEAR</b>	CH311	4	CH312	3
	UI331 or CH531	3	CH313	3
	Behavioral Systems	3	UI443	3
	Living Systems	3	Economic Systems	3
	Political Systems	3	Literary Expression	3
<b>Total</b>	<b>16</b>	<b>Total</b>	<b>15</b>	
Milestone: maintain 2.0 cumulative GPA				
<b>FOURTH YEAR</b>	Chemistry Electives	3-4	CH498	1
	Develop of a Major Civ	3	Chemistry Electives	4
	Elective	3	Elective	3
	Elective	3-4	Elective	3
			Elective	3
<b>Total</b>	<b>13-14</b>	<b>Total</b>	<b>14</b>	
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 University Studies program, completion of 39 senior division hours (300-599), career proficiencies (CL001-004), Writing Proficiency Exam (WP003), and completion of the Measure of Academic Proficiency and Progress (MAP) at the senior level. 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 in Chemistry degree.

Revised  
3/31/2017