Chemistry: ACS Certified Chemistry Option

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, ACS Certified 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), chemical safety and hygiene, hazardous waste management, environmental protection, cheminformatics and technical writing, to name a few. The ACS Certified chemistry curriculum provides an excellent basis for graduate and professional areas of study.

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

• Completion of the ACS Certified Chemistry program 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.

• ACS Certified 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 96,200 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.

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
This is a guide based on the 2019-2020 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.

**Required Courses:**

- **MA140** Analytical Geometry and Calculus I (5)
- **MA145** Analytical Geometry and Calculus II (4)
- **PH120/020** Introductory Physics I (5)
- **PH230/030** General Physics I (5)
- **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)
- **CH532/533** Advanced Biochemistry Lecture and Lab (2+2)
- **CH450** Advanced Physical Chemistry (3)
- **CH447** Advanced 1 & 2 Dimensional NMR Techniques (3)
- **CH451** Environmental Chemistry (3)
- **CH452** Advanced Inorganic Chemistry (4)
- **CH575/075** Chemical Instrumentation (4)
- **UI331** or CH531
- **MA145** Foundations of Analytical Chemistry (5)

**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)
  - **CH563/063** Advanced Inorganic Chemistry (4)
  - **CH757/075** 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)
  - **CH500** Environmental Chemistry (3)
  - **CH532/533** Advanced Biochemistry Lecture and Lab (2+2)
  - **CH545** Organic Preparations and Characterization (3)
  - **CH563/063** Advanced Inorganic Chemistry (4)
  - **CH757/075** 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
  - **PH230/030** General Physics I (5) OR
  - **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.

**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

### SAMPLE FOUR-YEAR PLAN

#### FALL SEMESTER

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Milestone: maintain 2.0 cumulative GPA

#### SPRING SEMESTER

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Milestone: maintain 2.0 cumulative GPA

#### SUMMER COURSES ARE ENCOURAGED TO AVOID 18 HOURS SEMESTERS

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#### THIRD YEAR

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Milestone: maintain 2.0 cumulative GPA

#### FOURTH YEAR

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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, completion of 39 senior division hours (300-599), Writing Proficiency Exam (WP003).

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 4/29/2019