

Bachelor of Science (BS)

Biochemistry Option

Biochemistry deals with the chemical foundations and properties for all living processes. Biochemists study the chemical and physical properties, such as structure, composition and chemical reactions of substances found in living systems. Research by biochemists increases our knowledge about chemicals and processes that govern the living world and has led to the discovery and development of new and improved medicines, agricultural breakthroughs and other areas that unveil the mysteries of living things. Biochemists 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 biochemistry.

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.

/ The Biochemistry option prepares graduates for a career in biochemistry, biotechnology, and chemistry and also provides an excellent basis for graduate and professional areas of study. This degree option is ideally suited for students interested in pre-medicine due to its interdisciplinary nature. Example job titles include biochemist, biotechnology engineer, sales rep (pharmaceutical, chemicals and instruments), product developer, quality control specialist, chemical safety and hygiene manager and environmental analyst.

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

/ Biochemistry 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.

/ Biochemistry students gain a rigorous foundation in chemistry, science and math in the context of a broad university education that develops critical thinking skills.

/ 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 and Graduate Schools 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 and biochemistry visit:

<https://www.acs.org/content/acs/en/careers/college-to-career.html>

According to the United States Bureau of Labor Statistics, there were 31500 biochemistry related jobs in 2016. This number is expected to increase by 11% by 2026. Source: <https://www.bls.gov/ooh/life-physical-and-social-science/biochemists-and-biophysicists.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

Chemistry: Biochemistry Option

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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:

- ___ **CH185** *General Chemistry (5)*
- ___ **CH186** *Foundations of Inorganic Chemistry (3)*
- ___ CH187 Inorganic Chemistry and Qualitative Analysis Laboratory (2)
- ___ CH271 Foundations of Analytical Chemistry (5)
- ___ CH311 Foundations of Physical Chemistry (4)
- ___ CH313 Physical Chemistry Laboratory (3)
- ___ **CH341** *Foundations of Organic Chemistry (4)*
- ___ CH342 Organic Chemistry Laboratory I (1)
- ___ CH498 Professional Presentation in Chemistry (1)
- ___ CH531 Foundations of Biochemistry (3)
- OR
- ___ UI331 Foundations of Biochemistry (3)
- ___ UI443 Professional Experience in Chemistry (3)

Biochemistry Option Courses:

- ___ BI173 Cell & Organismal Biology (4)
- ___ BI283 Genetics (4)
- ___ BI310 General Microbiology (4)
- ___ BI404 Cell Biology (3)
- ___ CH312 Advanced Physical Chemistry (3)
- ___ CH343 Advanced Organic Chemistry (3)
- ___ CH344 Organic Chemistry Laboratory II (2)
- ___ CH532 Advanced Biochemistry (2)
- ___ CH533 Biochemistry Laboratory (2)

Additional Requirements:

- ___ **MA140** *Analytical Geometry and Calculus I (5)*
- ___ MA145 Analytical Geometry and Calculus II (4)
- ___ PH120/020 Introductory Physics I (5)
- ___ PH121/021 Introductory Physics II (5)
- OR
- ___ PH230/030 General Physics I (5)
- ___ 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		Spring Semester	
	Course #	Hrs	Course #	Hrs
FIRST YEAR	UI100	3	BI173	4
	EN100	3	CH186	3
	CH185/085/005	5	CH187	2
	General Education	3	MA140	5
			General Education	3
	Total	14	Total	17
Milestone: maintain 2.0 cumulative GPA				
SECOND YEAR	BI283	4	BI310	4
	CH271/071	5	CH341	4
	MA145	4	CH342	1
	PH120/020 or PH230/030	5	PH121/021 or PH231/031	5
			General Education	3
	Total	18	Total	17
Milestone: maintain 2.0 cumulative GPA				
<i>(summer courses are encouraged to avoid 18 hour semesters)</i>				
THIRD YEAR	CH311*	4	CH312*	3
	CH343	3	CH313*	3
	CH344	2	UI443	3
	General Education	3	General Education	3
	General Education	3	General Education	3
	Total	15	Total	15
Milestone: maintain 2.0 cumulative GPA				
FOURTH YEAR	BI404	3	CH498	1
	UI331 or CH531	3	CH532	2
	General Education	3	CH533	2
	General Education	3	General Education	3
			Elective	4
	Total	12	Total	12
Milestone: maintain 2.0 cumulative GPA				

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

*CH311/312/313 should be taken in the junior year to avoid scheduling conflicts during the senior year with other required courses.

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.