

Chemistry: Biochemistry Option

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, forensics, and chemistry, and 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.

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

/ 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 34,600 biochemistry related jobs in 2019. This number is expected to increase by 4% by 2029. 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
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To explore
the College of Science,
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For advising
Center for Academic Advising
semo.edu/advising

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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: Biochemistry option – 68-71 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)

Biochemistry Option Courses:

- ___ BI 173 Cell/Organismal Biology (4)
- ___ BI 245 Lab Methods in Biotechnology (3)
- ___ BI 283 Genetics (4)
- ___ BI 310 General Microbiology (4)
- ___ CH 343 Adv Organic Chem (3)
- ___ CH 344 Organic Chem Lab II (2)
- ___ CH 420 Forensic Chemistry (4)
- ___ CH 532 Advanced Biochemistry (2)
- ___ CH 575 Chemical Instrumentation (4)
- ___ Choose 3-4 hours of BI, CH, or FS electives (300-500 level)

Choose one course:

- ___ BI 404 Cell Biology (3)
- ___ FS 552 Forensic Serology & DNA Analysis (2)

Choose one course:

- ___ BI 450 Investigative Molecular Biology and Biotechnology (3)
- ___ CH 533 Biochemistry Laboratory (2)

Choose one course:

- ___ MA 223 Elementary Probability and Statistics (3)
- ___ MA 423 Statistical Analysis for Forensic Science (3)

Additional Requirements:

- ___ MA 139 Applied Calculus (3)
AND
- ___ CS 101 Introduction to Computer Programming (3)
OR
- ___ MA 140 Analytic Geometry and Calculus I (5)
- ___ PH 120 Introductory Physics I (5)
AND
- ___ PH 121 Introductory Physics II (5)
OR
- ___ PH 230 General Physics I (5)
AND
- ___ PH 231 General Physics II (5)

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	1	BI173	4
	EN100	3	CH186	3
	CH184/185	4	CH187	1
	General Education	3	CH195	1
	General Education	3	Mathematics course	3-5
			General Education	3
	Total	14	Total	15-16
Milestone: maintain 2.0 cumulative GPA				

SECOND YEAR	BI283	4	BI310	4
	CH271/071	5	CH295	2
	CH341	4	CH343	3
	CH342	1	CH344	2
	General Education or	3	General Education	3
	CS101			
	Total	17	Total	14
Milestone: maintain 2.0 cumulative GPA				

(summer courses are encouraged to avoid 18 hour semesters)

THIRD YEAR	CH306	3	BI245	3
	CH531	3	CH532	2
	PH120/020 or	5	PH121/021 or	5
	PH230/030		PH231/030	
	General Education	3	MA223 or MA423	3
			General Education	3
	Total	14	Total	16
Milestone: maintain 2.0 cumulative GPA				

FOURTH YEAR	CH420	4	CH495	1
	CH533 or BI450	2-3	CH575	4
	BI/CH/FS Elective	3-4	FS552 or BI404	2-3
	General Education	3	Elective	3
	General Education or	3	Elective	3
	Elective		Elective	2-0
	Total	15-17	Total	14-15
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.

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

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

For advising
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