

Biology: Microbiology, Cellular and Molecular Biology, & Biotechnology Option**Bachelor of Science (BS)****Microbiology, Cellular and Molecular Biology & Biotechnology Option**

This option is designed for students preparing to do graduate work in any area of the laboratory life sciences or to seek full-time employment. There is high demand for graduates with laboratory research training in the public and private sectors. Required and supporting courses provide the background that is essential for admission into life sciences graduate programs or for employment in biotechnology.

The Department of Biology has numerous research and teaching labs that provide excellent opportunities for active experiences. Faculty advisors in this area are active in research programs and readily involve students in their research programs.

Biology students will...

- Meet their advisor each semester to assess their progress towards their post-graduation goals.
- Take a core of courses that prepares them for any area of biology.
- Take rigorous coursework in general microbiology, laboratory methods in biotechnology, and molecular genetics
- Select additional courses and electives in virology, immunology, investigative molecular biology, epidemiology, physiology, bioinformatics, health physics, and toxicology.
- Complete 80 hours for 2 credit hours of experiential learning in labs on-campus or summer programs.
- Complete additional coursework in chemistry, biochemistry, and mathematics to make them competitive for admission to graduate programs.
- Attend classes in the newly renovated Magill Hall furnished with modern equipment.

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.

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.

Recent Internship Placement

- Danforth Plant Research Center
- St. Francis Medical Center
- Southeast Missouri Hospital
- Washington University in St. Louis
- University of Nebraska
- Indian Association for the Cultivation of Science (Kolkata)

Graduate School Matriculation

- Washington University in St. Louis
- Southeast Missouri State University
- Missouri State University
- University of Missouri
- Vanderbilt University
- University of Wisconsin
- University of Minnesota
- University of Cincinnati
- Rensselaer Polytechnic Institute
- University of Massachusetts
- Miami University Ohio
- University of Arkansas for Medical Science, College of Pharmacy
- Southeast Health College of Nursing and Health Science (Medical Technology)

Employment of Past Graduates

- Monsanto
- Pfizer
- Sigma-Aldrich Chemical Company
- Biokryowa
- Proctor and Gamble
- St. Jude's Children's Hospital
- Washington University in St. Louis
- St. Louis University
- Zoetis

A number of graduates have matriculated to a variety of medical schools.

Admission Requirements

A college preparatory sequence that includes three years of science (including biology, chemistry, and physics) and mathematics through advanced algebra is encouraged.

Special Options with Biology

Southeast offers a Master of Natural Science in Biology.

Transfer and Dual Credit Students

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

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

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This is a guide based on the 2018-2019 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:

- ___ BI163 Evolution & Ecology (4)
- ___ BI173 Cell & Organismal Biology (4)
- ___ **BI283 Genetics (4)**
- ___ BI389 Career Development in Biology (1)
- ___ CH185/085/005 General Chemistry (5)

Choose one math course:

- ___ MA116 Precalculus A (3)
- ___ MA137 Precalculus (5)
- ___ MA139 Applied Calculus (3)
- ___ MA140 Analytical Geometry & Calculus I (5)

Choose one additional math course:

- ___ MAxxx Additional math (for which MA116 is a prerequisite) (3)
- OR
- ___ MA155 Statistical Reasoning (3)

Experiential Learning Requirement: 2 hours

- ___ BI 471-473 Internships in Biology (2)
- ___ BI 551-553 Biology Field Studies (2)
- ___ BI563-565 Experience in Museum Curation (1-3)
- ___ BI 570 Development of Instructional Materials (1)
- ___ BI 589-591 Biological Research (2)

Microbiology, Cellular and Molecular Biology, & Biotechnology Option Required Courses:

- ___ **BI245 Lab Methods in Biotechnology (3)**
- ___ **BI310 General Microbiology (4)**

Choose 6 Hours From:

- ___ BI404 Cell Biology (3)
- ___ BI413 Molecular Genetics (3)
- ___ BI442 Immunology (3)
- ___ BI445 Microbial Physiology (3)
- ___ BI/BT450 Investigative Molecular Biology and Biotechnology (3)
- ___ BI543 Pathogenic Microbiology (2)
- ___ BI544 Pathogenic Microbiology Lab (1)
- ___ ZO414 Developmental Biology (3)

Biology Electives: Choose 10 Hours

- ___ Any BI, BO, ZO, BT courses, 300 level and above

Non-Biology Requirements: 13 hours

- ___ CH186 Foundations of Inorganic Chemistry (3)
- ___ CH187 Inorganic Chemistry and Qualitative Analysis Lab (2)
- ___ **CH341 Foundations of Organic Chemistry (4)**
- ___ CH342 Organic Chemistry Lab I (1)
- ___ CH531/UI331 Foundations of Biochemistry (3)

University Studies Requirements – some requirements may be fulfilled by coursework in major program

- Social and Behavioral Sciences – 3 hours
- Constitution requirement – 3 hours
- US History 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)

SAMPLE FOUR-YEAR PLAN

	Fall Semester		Spring Semester	
	Course #	Hrs	Course #	Hrs
FIRST YEAR	UI100	3	EN100	3
	BI163	4	BI173	4
	CH185/085/005	5	CH186	3
	MA116/137/139/140	3-5	CH187	2
			Additional Math course	3
	Total	15-17	Total	15
Milestone: achieve a target cumulative GPA of 3.2				

SECOND YEAR	BI283	4	BI245	3
	CH341	4	BI310	4
	CH342	1	CH343#	3
	University Studies	3	CH344#	2
	University Studies	3	University Studies	3
	Total	15	Total	15
Milestone: achieve a target cumulative GPA of 3.2				

THIRD YEAR	MCM option course	3	MCM option course	3
	BI389	1	PH121/021#	5
	PH120/020#	5	Biology elective	3
	University Studies	3	Experiential Learning Crs	2
	University Studies	3	University Studies	3
	Total	15	Total	16
Milestone: achieve a target cumulative GPA of 3.2				

FOURTH YEAR	Biology Elective	3	CH533#	2
	Biology Elective	3	Biology Elective	1
	UI331/CH531	3	University Studies	3
	University Studies	3	University Studies	3
	Elective	2	Elective	3
	Total	14	Total	15
Milestone: achieve a target cumulative GPA of 3.2				

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

#Suggested non-biology elective courses

Degree requirements for all students: a minimum of 120 credit hours, completion of University Studies program, completion of 39 senior division hours (300-599), 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 2.00 GPA in the major and overall are required to graduate with a BS in Biology degree.

Revised
7/10/2018