

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

Love the lab? The Biology: Microbiology, Cellular and Molecular Biology & Biotechnology (MCM) 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. Students may select additional courses and electives in virology, immunology, investigative molecular biology, epidemiology, physiology, bioinformatics, health physics and toxicology.

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. Students attend classes in the newly renovated Magill Hall furnished with state-of-the-art equipment.

/ The MCM option prepares graduates for careers in cell biology, microbiology and biotechnology. Example job titles include research scientist, microbiologist, biotechnology research assistant, laboratory technician, laboratory safety manager and research coordinator.

/ 100% of Southeast programs offer real-world experience. MCM students earn this experience through required 80 hours outside the class room which earn 2 college credits. 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.

/ MCM students take rigorous coursework in general microbiology, laboratory methods in biotechnology, and molecular genetics which prepares them for advanced study or employment. Students also complete additional course work in chemistry, biochemistry, and mathematics to make them competitive for admission to graduate programs in order to qualify them for employment and graduate school.

/ The Biology Club also provides peer-support and guidance for MCM students. Students will meet with their advisor each semester to assess their progress towards post-graduation goals.

/ 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.

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
- Biokytowa
- 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/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

Biology: Microbiology, Cellular and Molecular Biology, & Biotechnology Option**Bachelor of Science (BS)****Degree Map 2019-2020**

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:

- ___ BI163 Evolution & Ecology (4)
- ___ BI173 Cell & Organismal Biology (4)
- ___ **BI283 Genetics (4)**
- ___ BI389 Career Development in Biology (2)
- ___ 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

- ___ BI471-473 Internships in Biology (2)
- ___ BI551-553 Biology Field Studies (2)
- ___ BI563-565 Experience in Museum Curation (1-3)
- ___ BI570 Development of Instructional Materials (1)
- ___ BI589-591 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:

- ___ BI403 Medical Genetics (3)
- ___ BI404 Cell Biology (3)
- ___ BI413 Molecular Genetics (3)
- ___ BI442 Immunology (4)
- ___ BI445 Microbial Physiology (3)
- ___ BI/BT450 Investigative Molecular Biology and Biotechnology (3)
- ___ BI543 Pathogenic Microbiology (4)
- ___ ZO414/014 Developmental Biology (4)

Biology Electives: Choose 9 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)

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	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
	General Education	3	CH344#	2
	General Education	3	General Education	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	2	PH121/021#	5
	PH120/020#	5	Biology elective	3
	General Education	3	Experiential Learning Crs	2
	General Education	3	General Education	3
	Total	16	Total	16
Milestone: achieve a target cumulative GPA of 3.2				

FOURTH YEAR	Biology Elective	3	CH533#	2
	Biology Elective	3	General Education	3
	UI331/CH531	3	General Education	3
	General Education	3	Elective	3
	Elective	2	Elective	3
	Total	14	Total	14
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 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 2.00 GPA in the major and overall are required to graduate with a BS in Biology degree.