

Bachelor of Science - Concentration in Microbiology

Note: All **BIOL** & **PHYS** prerequisites must be passed with a **C- or better**, unless stated otherwise. All **CHEM** & **MATH** prerequisites must be passed with a **C or better**, unless stated otherwise.

Requirement	if taken	Course		Units	Prerequisites by ID
		ID	Title		
vision Courses					
<i>Courses may be transferable from community college; check ASSIST.org for more information</i>					
All Required		BIOL 230	Introductory Biology 1	5	None
		BIOL 240	Introductory Biology 2	5	BIOL 230
		CHEM 115	General Chemistry 1 + Lab	5	see bulletin: http://bulletin.sfsu.edu/courses/chem/
		CHEM 215/216	General Chemistry 2 + Lab	3/2	CHEM 115, CHEM 215 (concurrent OK for lab)
		CHEM 233	Organic Chemistry 1	3	CHEM 115, CHEM 215
		MATH 226	Calculus 1	4	see bulletin: http://bulletin.sfsu.edu/courses/math/
		PHYS 111/112	General Physics 1 + Lab	3/1	MATH 198 or MATH 199
		PHYS 121/122	General Physics 2 + Lab	3/1	PHYS 111, PHYS 112
<u>CHOOSE 1 ONLY</u>		MATH 124	Elementary Statistics	3	see bulletin: http://bulletin.sfsu.edu/courses/math/
		MATH 227	Calculus 2	4	MATH 226
		MATH 228	Calculus 3	4	MATH 227
		CSC 210	Intro to Computer Programming	3	None
		BIOL 358	Forensic Genetics: Math Matters	4	BIOL 230, MATH 199
		BIOL 458	Biometry	4	One college-level Biology course

Total Units for Lower Division

vision Courses					
<i>Courses do not need to be taken in order, only requirement is taking the prerequisites</i>					
All Required		BIOL 355	Genetics	3	BIOL 230, BIOL 240, CHEM 115 (C- or better)
		BIOL 401	General Microbiology	3	BIOL 230, BIOL 240, CHEM 233 (C- or better)
		BIOL 402GW	General Microbiology Laboratory	3	GE A2, BIOL 401 (concurrent OK)
		BIOL 442	Microbial Physiology	3	BIOL 401, BIOL 402GW, (CHEM 349 -OR- CHEM 340)
		CHEM 335	Organic Chemistry II	3	CHEM 115, CHEM 215, CHEM 233
<u>CHOOSE 1 ONLY</u>		CHEM 340	Biochemistry 1	3	CHEM 215, CHEM 233, CHEM 335
		CHEM 349	General Biochemistry	3	CHEM 215, CHEM, 233, CHEM 335 (C- or better)
Electives: <u>CHOOSE 12</u> including at least 3 laboratory courses with approval of an advisor (indicated with *)		BIOL 351GW*	Experiment in Cell & Molecular Biology	4	GE A2, BIOL 350, BIOL 355
		BIOL 420	General Virology	3	BIOL 401, BIOL 402GW
		BIOL 425	Emerging Diseases	3	BIOL 230, BIOL 240, BIOL 355
		BIOL 430	Medical Microbiology	3	BIOL 401 (C or better)
		BIOL 431*	Medical Microbiology Lab	2	BIOL 401, BIOL 402GW, BIOL 430 (concurrent OK)
		BIOL 435	Immunology	3	BIOL 350 -OR- BIOL 401
		BIOL 436*	Immunology Laboratory	2	BIOL 402GW (or equivalent), BIOL 435 (concurrent OK)
		BIOL 443*	Microbial Physiology Laboratory	2	BIOL 442 (concurrent OK)
		BIOL 446*	Microbial Genomics	4	BIOL 401, BIOL 402 GW, BIOL 355
		BIOL 453	General Parasitology	3	BIOL 230, BIOL 240, BIOL 355
		BIOL 454*	General Parasitology Laboratory	1	BIOL 453 (concurrent OK)
		BIOL 490*	Ecology of Infectious Diseases	4	BIOL 230, BIOL 240
		BIOL 625*	Hematology	3	BIOL 442
		BIOL 638*	Bioinformatics and Genome Annotation	4	BIOL 230
		BIOL 699*	Independent Study in Biology	1-3	Senior standing or consent from instructor

	BIOL/CHEM/ERTH 741*	Electron Microscopy	4	Senior standing or consent from instructor
	CHEM 336* -OR- CHEM 343*	Organic Chemistry 2 Lab -OR- Biochemistry 1 Lab	2 or 3	CHEM 234, CHEM 335 (concurrent OK) -OR- CHEM 216, CHEM 234, (CHEM 340 -OR- CHEM 349)
Substitutions, if any				

Total Units for Upper Division

Total Units Needed for Degree