

Department of Biology Graduation Checklist
<https://biology.sfsu.edu/advising/undergraduate>

LD= _____

Student: _____ E-mail _____

UD= _____

Last First

Advisor: _____ Phone _____

BACHELOR OF ARTS IN GENERAL BIOLOGY

Course is 3 units unless otherwise noted. Prerequisites are listed in brackets next to course number.

Lower Division Requirements (32-33 units)

Class	Prerequisites (must be completed with a C- or better, unless otherwise stated; however, Chemistry prerequisite courses must be completed with a C or better)	Class Name	Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 230		Introductory Biology I	5	yes	yes	no		
BIOL 240	Biol 230	Introductory Biology II [Meets GE Areas B2 (Life Science) & B3 (Lab Science)]	5	yes	yes	no		
CHEM 115	see http://bulletin.sfsu.edu/courses/chem/	General Chemistry I: Essential Concepts of Chemistry	5	yes	yes	no		
CHEM 130	Chem 115	General Organic Chemistry [meets GE Area B1] - can request substitution with CHEM 233; Need to use Advisor Request to update Degree Progress Report	3	yes	yes	yes		
CHEM 215	Chem 115	General Chemistry II (CHEM 216 is recommended)	3	yes	yes	yes		
PHYS 111/112	see http://bulletin.sfsu.edu/courses/phys/	General Physics I/Laboratory (3/1)	4	yes	yes	yes		
PHYS 121/122	see http://bulletin.sfsu.edu/courses/phys/	General Physics II/Laboratory (3/1)	4	yes	yes	yes		

One course from the following (3-4 units):

MATH 124	see http://bulletin.sfsu.edu/courses/math/	Elementary Statistics		yes	yes	yes		
MATH 226	see http://bulletin.sfsu.edu/courses/math/	Calculus I (4)		yes	yes	yes		

Total lower division requirements (units): 32-33

Note: Biol 231, Advising for Success as a Biology Major (1 unit, online) is HIGHLY RECOMMENDED

Upper Division Requirements (13-23 required units) (1-9 additional elective units)

							v	on DPR?
BIOL 355	Biol 230 + Biol 240 + Chem 115	Genetics [meets GE UD-B requirement]	3	yes	yes	yes		

One physiology course from the following (3 units):

BIOL 442	Biol 402 + Biol 402GW + Chem 349	Microbial Physiology		yes	no	no		
BIOL 525	Biol 230 + Biol 240 + Chem 130	Plant Physiology		yes	yes	no		
BIOL 612	Biol 230 + Biol 240 + Chem 130 + Phys 121	Human Physiology		yes	yes	yes		
BIOL 630	Biol 230 + Biol 240 + [Chem 130 or Chem 233]	Animal Physiology		yes	yes	no		

One cell biology course from the following (3-4 units):

BIOL 350	Biol 230 + Biol 240 + Chem 115	Cell Biology		yes	yes	yes		
BIOL 358	Biol 230 + Math 199	Forensic Genetics: Math Matters (4)		yes	no	no		
BIOL 401	Biol 230 + Biol 240 + Chem 233	General Microbiology		yes	yes	no		
BIOL 435	Biol 350 or Biol 401	Immunology		yes	yes	no		
BIOL 453	Biol 230 + Biol 240 + Biol 355	General Parasitology		yes	no	no		
CHEM 349	see http://bulletin.sfsu.edu/courses/chem/	General Biochemistry		yes	yes	yes		

One physiology or cell biology laboratory course from the following (1-4 units):

BIOL 351GW	Biol 350 + Biol 355 + GE Area 2	Experiments in Cell and Molecular Biology - GVAR (4)		yes	yes	no		
BIOL 402GW	Biol 401 (may be taken concurrently) + GE Area 2	General Microbiology Laboratory - GVAR		yes	yes	no		
BIOL 436	Biol 402GW, concurrent enrollment in Biol 435	Immunology Laboratory (2)		no	no	no		
BIOL 443	Biol 442 (may be taken concurrently)	Microbial Physiology Laboratory (2)		no	no	no		
BIOL 454	Biol 453 (may be taken concurrently)	Parasitology Laboratory (1)		yes	no	no		
BIOL 526	Biol 230 + Biol 240 + Chem 130	Plant Molecular Physiology Laboratory (2)		no	yes	no		
BIOL 613GW	GE Area 2 + [Biol 612 or Biol 630 (may be taken concurrently)]	Human Physiology Laboratory - GVAR		yes	yes	yes		
BIOL 631GW	GE Area 2 + Biol 612 or Biol 630	Animal Physiology Laboratory - GVAR (4)		yes	no	no		
CHEM 343	see http://bulletin.sfsu.edu/courses/chem/	Biochemistry I Laboratory (not listed in Bulletin, but will count. Need to use Advisor Request to update Degree Progress Report)		yes	yes	no		

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One ecology course from the following (2-4 units):

			Fa 21	Sp 22	Su 22	√	on DPR?
BIOL 482	Biol 230 + Biol 240	Ecology (4)	yes	yes	no		
BIOL 490	Biol 230 + Biol 240	Ecology of Infectious Disease (4)	no	no	no		
BIOL 529GW	Biol 230 + Biol 240 + GE Area 2	Plant Ecology - GVAR (4)	yes	no	no		
BIOL 532	Biol 230 + Biol 240	Restoration Ecology	yes	no	no		
BIOL 534	Biol 230 + Biol 240	Wetland Ecology (4)	no	yes	no		
BIOL 580	Biol 230 + Biol 240 + Chem 215 + Chem 216; ecology course recommended	Limnology	no	no	no		
BIOL 582	Biol 230 + Biol 240	Biological Oceanography (4)	yes	yes	no		
BIOL 585	Biol 230 + Biol 240	Marine Ecology	yes	yes	no		
BIOL 586	Biol 585 (may be taken concurrently)	Marine Laboratory (2)	no	no	no		

One evolution or organismal biology course from the following (1-5 units):

BIOL 328	Biol 230	Human Anatomy (4)	yes	yes	no		
BIOL 337	Biol 230 + Biol 240 + Biol 355	Evolution	yes	yes	no		
BIOL 380	Biol 355 (Biol 337 is recommended)	Evolutionary Developmental Biology	no	yes	no		
BIOL 382	Biol 350 + Biol 355, GPA 3.0 or higher	Developmental Biology	yes	yes	no		
BIOL 425	Biol 230 + Biol 240 + [Biol 355 or Biol 401 or Biol 350] + Chem 130	Emerging Diseases	no	yes	no		
BIOL 453/454	Biol 230 + Biol 240 + Biol 355, Biol 453 may be taken concurrently with Biol 454	General Parasitology/Laboratory (3/1)*	yes	no	no		
BIOL 460	Biol 230 + Biol 240	General Entomology (4)	no	no	no		
BIOL 475GW	Biol 230 + Biol 240 + GE Area 2	Herpetology - GVAR	no	yes	no		
BIOL 478GW	Biol 230 + Biol 240 + GE Area 2	Ornithology - GVAR (4)	no	yes	no		
BIOL 500	Biol 230 + Biol 240	Evolution and Diversity of Plants (4)	no	no	no		
BIOL 502	Biol 230 + Biol 240, GPA 3.0 or higher	Biology of the Algae	no	no	no		
BIOL 504	Biol 230 + Biol 240	Biology of the Fungi (4)	no	no	no		
BIOL 505	Biol 230 + Biol 240	Comparative Anatomy of Vascular Plants (4)	yes	no	no		
BIOL 514	Biol 230 + Biol 240, GPA 3.0 or higher	Plant Taxonomy (5)	no	yes	no		
BIOL 555	Biol 230 + Biol 240	Marine Invertebrate Zoology (4)	no	no	no		
BIOL 570GW	Biol 230 + Biol 240 + GE Area 2	Biology of Fishes - GVAR (4)	no	no	no		
BIOL 600	Biol 230 + Biol 240	Animal Behavior	no	yes	no		
BIOL 638	Biol 230, GPA 3.0 or higher	Bioinformatics & Genome Annotations (4)	no	yes	no		

***Note: cannot double count Biol 453 to meet both Cell Biology & Evolution/Organismal Biology requirements**
 There are multiple options for meeting the GVAR requirement (course name must have GW) - consult with advisor
 GVAR course must be completed with a C- or better to meet graduation requirements

Upper division electives selected in consultation with an advisor:.....

1 - 9 additional units

•Courses can be those listed above, not already used to satisfy requirements in those categories.

•Only one of the following courses can be included among those selected:

BIOL 317, BIOL 327, BIOL 330, and BIOL 349.

•Up to three units of BIOL 699 can be used within the UD elective units

•All Biology courses that have BIOL 230 and/or BIOL 240 as prerequisites can also be used as electives.

Additional elective courses include: 1-9 elective units (incorrect in Bulletin)

			Fa 21	Sp 22	Su 22	√	on DPR?
BIOL 332	Biol 230 + Biol 240 + Biol 355, GPA 3.0 or higher	Health Disparities in Cancer	no	no	no		
BIOL 344GW	Biol 230 + Biol 240 + GE Area 2, GPA 3.0 or higher	Research Skills - GVAR	no	no	no		
BIOL 461	Biol 230 + Biol 240	Insect Taxonomy (4)	no	no	no		
BIOL 464	Biol 230 + Biol 240	Medical Entomology	no	no	no		
BIOL 470	Biol 230 + Biol 240	Natural History of Vertebrates (4)	no	yes	no		
BIOL 492	Biol 230 + Biol 240	Comparative Anatomy of Vertebrates (4)	no	no	no		
BIOL 530	Biol 230 + Biol 240	Conservation Biology	yes	no	no		
BIOL 550	Biol 230 + Biol 240 + upper division ecology course	Plant and Animal Interactions (4)	no	no	no		
BIOL 555	Biol 230 + Biol 240	Marine Invertebrate Zoology (4)	no	no	no		
BIOL 556	Biol 230 + Biol 240	Natural History of Marine Invertebrates (4)	no	no	no		
BIOL 577	Biol 230	Ecological and Environmental Modeling (4)	no	no	no		
BIOL 607	Biol 230 + Biol 240 + Biol 355	Conservation and Management of Marine Mammals	no	no	no		
BIOL 609	Biol 230	Physics in Medicine	no	no	no		
BIOL 614	Biol 230 + Biol 240	Vertebrate Histology (4)	no	no	no		

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Course Num.	Course Title	Units	on			v	DPR?
			Fa 21	Sp 22	Su 22		
BIOL 616	Biol 230 + Biol 240 + Phys 121 + [Biol 612 or Biol 630]	Cardiorespiratory Physiology	yes	yes	no		
BIOL 620	Biol 230 + Biol 240	Endocrinology	yes	yes	no		
BIOL 621	Biol 230 + Biol 240 + Biol 330 + Chem 130; Biol 492 or a vertebrate anatomy course recommended	Reproductive Physiology	yes	no	yes		
BIOL 622	Biol 230 + Biol 240	Hormones and Behavior	no	yes	no		
BIOL 623	Biol 230 + Biol 240 + Biol 612 + Chem 130, GPA 3.0 or higher	Pharmacology	no	yes	no		
BIOL 627	Biol 230 + Chem 115 + Phys 121	Biophysics	no	no	no		
BIOL 640	Biol 230 + Biol 240 + Chem 130 + Phys 121; Biol 350 and Biol 612 recommended	Cellular Neurosciences	yes	no	no		
BIOL 652	Biol 230 + Biol 240 OR one upper division biology course	Science Education Partners in Biology (4)	no	no	no		

Note: Bulletin double lists elective courses-please be guided by this list.

Course Num.	Course Title	Units

What course has student taken to meet GEAR?

GEAR course must be completed with a C- or better to meet graduation requirements

	Required	Completed
Total upper division unit requirements (required and elective)	24-25	_____
Total units for major	57	_____

Please ignore Bulletin "49-64" units - this is incorrect. This should be a 57-unit minimum.

Recommendations for targeted post-graduate plans

Health profession
 Students must take Chem 216
 Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.

Graduate programs
 Students must take Chem 216
 Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.
 Students should take the full year of biochemistry: Chem 340 and Chem 341
 Student should consult with major advisor to optimize course plan for goals.

K-12 Teaching
 Completion of the BA in General Biology and additional geoscience breadth courses can be used to meet the Subject Matter Competency
 Requirements for the Single Subject Credential in Biological Sciences
 Students must take Chem 216
 Students must take Biol 337 (Evolution, 3 units)
Geosciences Breadth:
 ASTR 115/116: Introduction to Astronomy, 3 units and Lab, 1 unit
 EARTH 112: Our Dynamic Earth Lecture and Lab, 4 units
 EARTH 400: Earth Systems I, 3 units (includes lab) or EARTH 535: Planetary Climate Change, 4 units (includes lab)

Forensics Career
 Student transcript should contain: Biol 355 Genetics, Biol 357 Molecular Genetics, Chem 349 General Biochemistry, Math 124 Statistics and Chem 321/322 Analytical Chemistry.

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LD= _____

UD= _____

Student: _____ E-mail _____

Last First

Advisor: _____ Phone _____

BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN CELL & MOLECULAR BIOLOGY

Course is 3 units unless otherwise noted.

Lower Division Requirements (32-35 units)

Class	Prerequisites (must be completed with a C- or better, unless otherwise stated; however, Chemistry prerequisite courses must be completed with a C or better)	Class Name	Units	Fa 21	Sp 22	Su 22	√	on DPR?
BIOL 230		Introductory Biology I	5	yes	yes	no		
BIOL 231		Advising for Success as a Biology Major	1	yes	yes			
BIOL 240	Biol 230	Introductory Biology II [Meets GE Areas B2 (Life Science) & B3 (Lab Science)]	5	yes	yes	no		
CHEM 115	see http://bulletin.sfsu.edu/courses/chem/	General Chemistry I: Essential Concepts of Chemistry	5	yes	yes	no		
CHEM 215/216	Chem 115	General Chemistry II: Quant. Appl. of Chem. Conc./Lab (3/2)	5	yes	yes	yes		
MATH 226	see http://bulletin.sfsu.edu/courses/math/	Calculus I	4	yes	yes	yes		
PHYS 111/112	see http://bulletin.sfsu.edu/courses/phys/	General Physics I/Laboratory (3/1)	4	yes	yes	yes		

Select one organic chemistry sequence (3-6 units):

CHEM 130	Chem 115	General Organic Chemistry [meets GE Area B1]		yes	yes	yes		
CHEM 233 and CHEM 335	see http://bulletin.sfsu.edu/courses/chem/	Organic Chemistry I [meets GE Area B1] and Organic Chemistry II		yes	yes	yes		

Total lower division requirements (units): 32 - 35

Upper Division Requirements (19 units)

Class	Prerequisites	Class Name	Units	Fa 21	Sp 22	Su 22	√	on DPR?
BIOL 337	Biol 230 + Biol 240 + Biol 355	Evolution	3	yes	yes	no		
BIOL 350	Biol 230 + Biol 240 + Chem 115	Cell Biology	3	yes	yes	yes		
BIOL 351GW	Biol 350 + Biol 355 + GE Area 2	Experiments in Cell and Molecular Biology - GEAR (4)	4	yes	yes	no		
BIOL 355	Biol 230 + Biol 240 + Chem 115	Genetics [meets GE UD-B requirement]	3	yes	yes	yes		
BIOL 357	Biol 355	Molecular Genetics	3	yes	yes	no		
Select one biochemistry course (3 units):			3					
CHEM 340	Chem 215 + Chem 233 + Chem 335 with grades of C or better	Biochemistry I		yes	yes	no		
CHEM 349	Chem 215 (grade C or better) + [Chem 130 (grade C or better) or Chem 335 (grade of C- or better)]	General Biochemistry		yes	yes	yes		

Upper Division Requirements (units) 19

Upper Division Electives upon advisement (9 units)

At least one elective course must have an upper division laboratory component.

Graduate level courses may be used upon advisement

Class	Prerequisites	Class Name	Units	Fa 21	Sp 22	Su 22	√	on DPR?
BIOL 328 [†]	Biol 230	Human Anatomy (4)		yes	yes	no		
BIOL 332	Biol 230 + Biol 240 + Biol 355, GPA 3.0 or higher	Health Disparities in Cancer		no	no	no		
BIOL 344GW	Biol 230 + Biol 240 + GE Area 2, GPA 3.0 or higher	Research Skills - GEAR		no	no	no		
BIOL 349	GE Areas A1*, A2*, A3*, and B4*	Bioethics		no	no	no		
BIOL 356	Biol 355 with a grade of B or better	Honors Genetics (2)		yes	yes	no		
BIOL 358	Biol 230 + Math 199	Forensic Genetics: Math Matters (4)		yes	no	no		
BIOL 380	Biol 355 (Biol 337 is recommended)	Evolutionary Developmental Biology		no	yes	no		
BIOL 382	Biol 350 + Biol 355, GPA 3.0 or higher	Developmental Biology		yes	yes	no		
BIOL 391 [†]	One college-level physics course	Microscopy and Photomicrography (2)		no	no	no		
BIOL 401	Biol 230 + Biol 240 + Chem 233	General Microbiology		yes	yes	no		
BIOL 411	Biol 355 + BIOL 401 + BIOL 402GW + [CHEM 340 or CHEM 349]	Environmental Microbiology		no	no	no		
BIOL 420	Biol 401 + Biol 402GW	General Virology		no	yes	no		

Fa 21 Sp 22 Su 22 √ on DPR?

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BIOL 425	Biol 230 + Biol 240 + [Biol 355 or Biol 401 or Biol 350] + Chem 130	Emerging Diseases		no	yes	no		
BIOL 430	Biol 401 with a C or better	Medical Microbiology		yes	no	no		
BIOL 431 [†]	Biol 401 + Biol 402GW + Chem 349	Medical Microbiology Lab (2)		no	yes	no		
BIOL 435	Biol 350 or Biol 401	Immunology		no	yes	no		
BIOL 436 [†]	Biol 402GW, concurrent enrollment in Biol 435	Immunology Laboratory (2)		no	no	no		
BIOL 442	Biol 401 + Biol 402GW + Chem 349	Microbial Physiology		yes	no	no		
BIOL 443 [†]	Biol 442 (may be taken concurrently)	Microbial Physiology Laboratory (2)		no	no	no		
BIOL 446	Biol 401 + Biol 402GW + Biol 355	Microbial Genomics (4)		yes	no	no		
BIOL 453	Biol 230 + Biol 240 + Biol 355	General Parasitology		yes	no	no		
BIOL 454 [†]	Biol 453 (may be taken concurrently)	Parasitology Laboratory (1)		yes	no	no		
BIOL 458	one college-level Biology course	Biometry (4)		yes	yes	no		
BIOL 482 [†]	Biol 230 + Biol 240	Ecology (4)		yes	yes	no		
BIOL 490	Biol 230 + Biol 240	Ecology of Infectious Diseases (4)		no	no	no		
BIOL 525	Biol 230 + Biol 240 + Chem 130	Plant Physiology		yes	yes	no		
BIOL 526 [†]	Biol 230 + Biol 240 + Chem 130	Plant Molecular Physiology Laboratory (2)		no	yes	no		
BIOL 612	Biol 230 + Biol 240 + Chem 130 + Phys 121	Human Physiology		yes	yes	yes		
BIOL 615	Biol 230 + Biol 240 + Biol 612	Molecular Pathophysiology		no	no	no		
BIOL 619	Biol 212 or Biol 612	Pathophysiology		no	no	no		
BIOL 620	Biol 230 + Biol 240	Endocrinology		yes	yes	no		
BIOL 621	Biol 230 + Biol 240 + Biol 330 + Chem 130; Biol 492 or a vertebrate anatomy course recommended	Reproductive Physiology		yes	no	yes		
BIOL 622	Biol 230 + Biol 240	Hormones and Behavior		no	yes	no		
BIOL 627	Biol 230 + Chem 115 + Phys 121	Biophysics		no	no	no		
BIOL 630	Biol 230 + Biol 240 + [Chem 130 or Chem 233]	Animal Physiology		yes	yes	no		
BIOL 638 [†]	Biol 230, GPA 3.0 or higher	Bioinformatics & Genome Annotation (4)		no	yes	no		
BIOL 640	Biol 230 + Biol 240 + Chem 130 + Phys 121; Biol 350 and Biol 612 recommended	Cellular Neurosciences		yes	no	no		
BIOL 642	Biol 328 or Biol 612	Neural Systems Physiology		no	yes	no		
BIOL 644	Biol 230 + Biol 240 + [Biol 350 or Biol 355 or Biol 357]	LEADeR Service Learning Course: Learners Engaged in Advocating for Diversity in Science (4)		no	no	no		
OR BIOL 654	Biol 230	Peer Assistants for Learning Science (4)		yes	yes	no		
BIOL 699 [†]	Restricted to senior Biology majors; consent of the department and instructor.	Independent Study in Biology (1-3 units) <i>requires faculty mentor's approval</i>		yes	yes	no		

[†]meets upper division laboratory elective requirement

Upper Division Electives (units)

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Course Num.	Course Title	Units

What course has student taken to meet GEAR? (typically Biol 351GW)

GEAR course must be completed with a C- or better to meet graduation requirements

Required

Completed

Total upper division unit requirements (required and elective)	28	_____
Total units for major (minimum 60 units)	60-63	_____

Recommendations for targeted post-graduate plans

Health profession

Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.

Graduate programs

Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.

Students should take the full year of biochemistry: Chem 340 and Chem 341

Student should consult with major advisor to optimize course plan for goals.

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<https://biology.sfsu.edu/advising/undergraduate>

LD= _____
 UD= _____

Student: _____
 Last First
 Advisor: _____

E-mail _____
 Phone _____

**BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN ECOLOGY
 EVOLUTION, AND CONSERVATION BIOLOGY**

Course is 3 units unless otherwise noted.

Lower Division Requirements (24 units)

Class	Prerequisites (must be completed with a C- or better, unless otherwise stated; however, Chemistry prerequisite courses must be completed with a C or better)	Class Name	Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 230		Introductory Biology I	5	yes	yes	no		
BIOL 231		Advising for Success as a Biology Major	1	yes	yes	yes		
BIOL 240	Biol 230	Introductory Biology II [Meets GE Areas B2 (Life Science) & B3 (Lab Science)]	5	yes	yes	no		
CHEM 115	see http://bulletin.sfsu.edu/courses/chem/	General Chemistry I: Essential Concepts of Chemistry	5	yes	yes	no		
MATH 226	see http://bulletin.sfsu.edu/courses/math/	Calculus I	4	yes	yes	yes		
PHYS 111/112	see http://bulletin.sfsu.edu/courses/phys/	General Physics I/Laboratory (3/1)	4	yes	yes	yes		

Total lower division requirements (units): 24

Upper Division Requirements (17-20 units)

Class	Prerequisites	Class Name	Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 337	Biol 230 + Biol 240 + Biol 355	Evolution	3	yes	yes	no		
BIOL 355	Biol 230 + Biol 240 + Chem 115	Genetics [meets GE UD-B requirement]	3	yes	yes	yes		
BIOL 458	one college-level Biology course	Biometry (4)	4	yes	yes	no		
BIOL 482	Biol 230 + Biol 240	Ecology (4)		yes	yes	no		
<i>One of the following courses upon advisement (3-6 units):</i>								
BIOL 475GW	Biol 230 + Biol 240 + GE Area 2	Herpetology - GVAR		no	yes	no		
BIOL 478GW	Biol 230 + Biol 240 + GE Area 2	Ornithology - GVAR (4)		no	yes	no		
BIOL 529GW	Biol 230 + Biol 240 + GE Area 2	Plant Ecology - GVAR (4)		yes	no	no		
BIOL 570GW	Biol 230 + Biol 240 + GE Area 2	Biology of Fishes - GVAR (4)		no	no	no		
BIOL 670GW	GE Area A2 + Biol 240 + Biol 458 with grades of C or better; concurrent enrollment in BIOL 671 and BIOL 699 or BIOL 897.	Ecology and Evolution of Marine Systems I - GVAR (6)		no	no	no		

Ecology and Evolution Elective courses (select 9 units upon advisement)

Courses used to satisfy the electives above may not be double-counted here.

Class	Prerequisites	Class Name	Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 380	Biol 355 (Biol 337 is recommended)	Evolutionary Developmental Biology		no	yes	no		
BIOL 411	Biol 355 + Biol 401 + Biol 402GW + [CHEM 340 or CHEM 349]	Environmental Microbiology		no	no	no		
BIOL 453	Biol 230 + Biol 240 + Biol 355	General Parasitology		yes	no	no		
BIOL 460	Biol 230 + Biol 240	General Entomology (4)		no	no	no		
BIOL 461	Biol 230 + Biol 240	Insect Taxonomy (4)		no	no	no		
BIOL 470	Biol 230 + Biol 240	Natural History of Vertebrates (4)		no	yes	no		
BIOL 475GW ¹	Biol 230 + Biol 240 + GE Area 2	Herpetology - GVAR		no	yes	no		
BIOL 478GW ¹	Biol 230 + Biol 240 + GE Area 2	Ornithology - GVAR (4)		no	yes	no		
BIOL 490	Biol 230 + Biol 240	Ecology of Infectious Diseases (4)		no	no	no		
BIOL 500	Biol 230 + Biol 240	Evolution and Diversity of Plants (4)		no	no	no		
BIOL 502	Biol 230 + Biol 240, GPA 3.0 or higher	Biology of the Algae		no	no	no		
BIOL 504	Biol 230 + Biol 240	Biology of the Fungi (4)		no	no	no		
BIOL 505	Biol 230 + Biol 240	Comparative Anatomy of Vascular Plants (4)		yes	no	no		
BIOL 514	Biol 230 + Biol 240, GPA 3.0 or higher	Plant Taxonomy (5)		no	yes	no		
BIOL 529GW ¹	Biol 230 + Biol 240 + GE Area 2	Plant Ecology - GVAR (4)		yes	no	no		
BIOL 530	Biol 230 + Biol 240	Conservation Biology		yes	no	no		
BIOL 532	Biol 230 + Biol 240	Restoration Ecology		yes	no	no		
BIOL 534	Biol 230 + Biol 240	Wetland Ecology (4)		no	yes	no		
BIOL 555	Biol 230 + Biol 240	Marine Invertebrate Zoology (4)		no	no	no		
BIOL 570GW ¹	Biol 230 + Biol 240 + GE Area 2	Biology of Fishes - GVAR (4)		no	no	no		
BIOL 577	Biol 230	Ecological and Environmental Modeling (4)		no	no	no		
BIOL 580	Biol 230 + Biol 240 + Chem 215 + Chem 216; ecology course recommended	Limnology		no	no	no		
BIOL 582	Biol 230 + Biol 240	Biological Oceanography (4)		yes	yes	no		
BIOL 585	Biol 230 + Biol 240	Marine Ecology		yes	yes	no		
BIOL 600	Biol 230 + Biol 240	Animal Behavior		no	yes	no		
BIOL 670GW ¹	GE Area A2 + Biol 240 + Biol 458 with grades of C or better; concurrent enrollment in BIOL 671 + [BIOL 699 or BIOL 897]	Ecology and Evolution of Marine Systems I - GVAR (6)		no	no	no		
BIOL 671	BIOL 240 + Biol 458 with grades of C or better; concurrent enrollment in BIOL 670GW + [BIOL 699 or BIOL 897]	Ecology and Evolution of Marine Systems II (6)		no	no	no		

Physiology and Additional Elective courses (Select 9 units upon advisement)

Courses used to satisfy the electives above may not be double-counted here.

Class	Prerequisites	Class Name	Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 315	Biol 240 + Biol 458 (with grades C or better); GPA 3.0 or better	Field Methods in Ecology and Evolution (1)		no	no	yes		
BIOL 322	Biol 100	Human Sexuality: Integrative Science		no	no	no		
BIOL 327	GE Areas A1*, A2*, A3*, and B4*; one college-level Biology course	AIDS: Biology of the Modern Epidemic		yes	yes	no		
BIOL 328	Biol 230	Human Anatomy (4)		yes	yes	no		
BIOL 344GW	Biol 230 + Biol 240 + GE Area 2, GPA 3.0 or higher	Research Skills - GVAR		no	no	no		
BIOL 349	GE Areas A1*, A2*, A3*, and B4*	Bioethics		no	no	no		
BIOL 350	Biol 230 + Biol 240 + Chem 115	Cell Biology		yes	yes	yes		
BIOL 356	Biol 355 with a grade of B or better	Honors Genetics (2)		yes	yes	no		
BIOL 357	Biol 355	Molecular Genetics		yes	yes	no		
BIOL 358	Biol 230 + Math 199	Forensic Genetics: Math Matters (4)		yes	no	no		

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on

Fa 21	Sp 22	Su 22	v	DPR?
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BIOL 382	Biol 350 + Biol 355, GPA 3.0 or higher	Developmental Biology	yes	yes	no		
BIOL 391	One college-level physics course	Microscopy and Photomicrography (2)	no	no	no		
BIOL 401	Biol 230 + Biol 240 + Chem 233	General Microbiology	yes	yes	no		
BIOL 420	Biol 401 + Biol 402GW	General Virology	no	yes	no		
BIOL 425	Biol 230 + Biol 240 + [Biol 355 or Biol 401 or Biol 350] + Chem 130	Emerging Diseases	no	yes	no		
BIOL 430	Biol 401 with a C or better	Medical Microbiology	yes	no	no		
BIOL 435	Biol 350 or Biol 401	Immunology	no	yes	no		
BIOL 436	Biol 402GW, concurrent enrollment in Biol 435	Immunology Laboratory (2)	no	no	no		
BIOL 442	Biol 401 + Biol 402GW + Chem 349	Microbial Physiology	yes	no	no		
BIOL 443	Biol 442 (may be taken concurrently)	Microbial Physiology Laboratory (2)	no	no	no		
BIOL 446	Biol 401 + Biol 402GW + Biol 355	Microbial Genomics (4)	yes	no	no		
BIOL 454	Biol 453 (may be taken concurrently)	Parasitology Laboratory (1)	yes	no	no		
BIOL 475GW [†]	Biol 230 + Biol 240 + GE Area 2	Herpetology - GVAR	no	yes	no		
BIOL 478GW [†]	Biol 230 + Biol 240 + GE Area 2	Ornithology - GVAR (4)	no	yes	no		
BIOL 490	Biol 230 + Biol 240	Ecology of Infectious Diseases (4)	no	no	no		
BIOL 492	Biol 230 + Biol 240	Comparative Anatomy of Vertebrates (4)	no	no	no		
BIOL 500	Biol 230 + Biol 240	Evolution and Diversity of Plants (4)	no	no	no		
BIOL 502	Biol 230 + Biol 240, GPA 3.0 or higher	Biology of the Algae	no	no	no		
BIOL 504	Biol 230 + Biol 240	Biology of the Fungi (4)	no	no	no		
BIOL 505	Biol 230 + Biol 240	Comparative Anatomy of Vascular Plants (4)	yes	no	no		
BIOL 508	Biol 230 + Biol 240	Plants and Human Affairs	no	no	no		
BIOL 514	Biol 230 + Biol 240, GPA 3.0 or higher	Plant Taxonomy (5)	no	yes	no		
BIOL 525	Biol 230 + Biol 240 + Chem 130	Plant Physiology	yes	yes	no		
BIOL 526	Biol 230 + Biol 240 + Chem 130	Plant Molecular Physiology Laboratory (2)	no	yes	no		
BIOL 532	Biol 230 + Biol 240	Restoration Ecology	yes	no	no		
BIOL 534	Biol 230 + Biol 240	Wetland Ecology (4)	no	yes	no		
BIOL 550	Biol 230 + Biol 240 + upper division ecology course	Plant and Animal Interactions (4)	no	no	no		
BIOL 555	Biol 230 + Biol 240	Marine Invertebrate Zoology (4)	no	no	no		
BIOL 556	Biol 230 + Biol 240	Natural History of Marine Invertebrates (4)	no	no	no		
BIOL 570GW [†]	Biol 230 + Biol 240 + GE Area 2	Biology of Fishes - GVAR (4)	no	no	no		
BIOL 572	Upper-division standing; GPA of 3.0 or higher	Colloquium in Ecology, Evolution, and Conservation (2)	no	no	no		
BIOL 575	Biol 570GW or an ecology course	Fisheries Biology	no	no	no		
BIOL 577	Biol 230	Ecological and Environmental Modeling (4)	no	no	no		
BIOL 580	Biol 230 + Biol 240 + Chem 215 + Chem 216; ecology course recommended	Limnology	no	no	no		
BIOL 584	Chem 115	Marine Microbial Ecology Laboratory (1)	no	no	no		
BIOL 585	Biol 230 + Biol 240	Marine Ecology	yes	yes	no		
BIOL 586	Biol 585 (may be taken concurrently)	Marine Laboratory (2)	no	no	no		
BIOL 600	Biol 230 + Biol 240	Animal Behavior	no	yes	no		
BIOL 612	Biol 230 + Biol 240 + Chem 130 + Phys 121	Human Physiology	yes	yes	yes		
BIOL 617	Biol 612 or Biol 630	Environmental Physiology	no	no	no		
BIOL 620	Biol 230 + Biol 240	Endocrinology	yes	yes	no		
BIOL 621	Biol 230 + Biol 240 + Biol 330 + Chem 130; Biol 492 or a vertebrate anatomy course recommended	Reproductive Physiology	yes	no	yes		
BIOL 622	Biol 230 + Biol 240	Hormones and Behavior	no	yes	no		
BIOL 630	Biol 230 + Biol 240 + [Chem 130 or Chem 233]	Animal Physiology	yes	yes	no		
BIOL 638	Biol 230, GPA 3.0 or higher	Bioinformatics & Genome Annotation (4)	no	yes	no		
BIOL 640	Biol 230 + Biol 240 + Chem 130 + Phys 121; Biol 350 and Biol 612 recommended	Cellular Neurosciences	yes	no	no		
BIOL 642	Biol 328 or Biol 612	Neural Systems Physiology	no	yes	no		
BIOL 644	Biol 230 + Biol 240 + [Biol 350 or Biol 355 or Biol 357]	LEADerS Service Learning Course: Learners Engaged in Advocating for Diversity in Science (4)	no	no	no		
OR BIOL 652	[Biol 230 + Biol 240] OR one upper division biology course	Science Education Partners in Biology (4)	no	no	no		
OR BIOL 654	Biol 230	Peer Assistants for Learning Science (4)	yes	yes	no		
BIOL 670GW [†]	GE Area A2 + Biol 240 + Biol 458 with grades of C or better; concurrent enrollment in BIOL 671 + [BIOL 699 or BIOL 897]	Ecology and Evolution of Marine Systems I - GVAR (6)	no	no	no		
BIOL 671	BIOL 240 + BIOL 458 with grades of C or better; concurrent enrollment in BIOL 670GW + [BIOL 699 or BIOL 897]	Ecology and Evolution of Marine Systems II (6)	no	no	no		
BIOL 699	Restricted to senior Biology majors; consent of the department and instructor.	Independent Study in Biology (1-3 units) <i>requires faculty mentor's approval</i>	yes	yes	no		

[†]May be used as an Ecology and Evolution or Physiology /Additional elective if not taken as one of the upper-division required courses.

Course Num.	Course Title	Units

What course has student taken to meet GVAR?

GVAR course must be completed with a C- or better to meet graduation requirements

	Required	Completed
Total upper division unit requirements:	35-38	_____
Total units for major (minimum 59 units)	59-62	_____

Recommendations for targeted post-graduate plans

Health profession	Students must take Chem 215/216 Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336. Students must take Phys 121/122.
Graduate programs	Students must take Chem 215/216 Students should take full year of organic chemistry with lab: Chem 233/234 and Chem 335/336. Students should take the full year of biochemistry: Chem 340 and Chem 341 Students must take Phys 121/122. Student should consult with major advisor to optimize course plan for goals.

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LD= _____
 UD= _____

Student: _____
 Last First
 Advisor: _____

E-mail _____
 Phone _____

BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN MARINE SCIENCE

Course is 3 units unless otherwise noted.

Lower Division Requirements (35-36 units)

Class	Prerequisites (must be completed with a C- or better, unless otherwise stated; however, Chemistry prerequisite courses must be completed with a C or better)	Class Name	Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 230		Introductory Biology I	5	yes	yes	no		
BIOL 231		Advising for Success as a Biology Major	1	yes	yes			
BIOL 240	Biol 230	Introductory Biology II [Meets GE Areas B2 (Life Science) & B3 (Lab Science)]	5	yes	yes	no		
CHEM 115	see http://bulletin.sfsu.edu/courses/chem/	General Chemistry I: Essential Concepts of Chemistry	5	yes	yes	no		
CHEM 130	Chem 115	General Organic Chemistry [meets GE Area B1]	3	yes	yes	yes		
MATH 226	see http://bulletin.sfsu.edu/courses/math/	Calculus I	4	yes	yes	yes		

Select one physics sequence (4 units):

PHYS 111/112	see http://bulletin.sfsu.edu/courses/phys/	General Physics I/Laboratory (3/1)		yes	yes	yes		
PHYS 220/222 ¹	see http://bulletin.sfsu.edu/courses/phys/	General Physics with Calculus I and Laboratory (3/1)		yes	yes	yes		

Select 8 - 9 units from the following:

CHEM 215/216	Chem 115	General Chemistry II: Quant. Appl.of Chem. Conc./Lab (3/2)		yes	yes	yes		
MATH 227 ¹	see http://bulletin.sfsu.edu/courses/math/	Calculus II (4)		yes	yes	yes		
select appropriate physics lecture/lab to complete physics sequence								
PHYS 121/122 ²	see http://bulletin.sfsu.edu/courses/phys/	General Physics II and Laboratory (3/1)		yes	yes	yes		
PHYS 230/232 ²	see http://bulletin.sfsu.edu/courses/phys/	General Physics with Calculus II and Laboratory (3/1)		yes	yes	yes		

1. If taking PHYS 220/PHYS 222, MATH 227 must be taken concurrently.

2. PHYS 111/PHYS 112 are the prerequisites for PHYS 121/PHYS 122.

PHYS 220/PHYS 222 are the prerequisites for PHYS 230/PHYS 232.

Total lower division requirements (units): **35 - 36**

Upper Division Requirements (22 - 27 units)

			Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 337	Biol 230 + Biol 240 + Biol 355	Evolution	3	yes	yes	no		
BIOL 355	Biol 230 + Biol 240 + Chem 115	Genetics [meets GE UD-B requirement]	3	yes	yes	yes		
BIOL 458	one college-level biology course	Biometry (4)	4	yes	yes	no		

Units selected from the following (3 - 4 units):

BIOL 582	Biol 230 + Biol 240	Biological Oceanography & Limnology (4)		yes	yes	no		
CHEM 680	Chem 215	Chemical Oceanography		no	yes	no		
ERTH 400	At least 9 units of coursework in geosci	Earth Systems I		yes	no	no		
ERTH 434	Upper-division standing; MATH 226 + [PHYS 111 or PHYS 220]; GPA of 3.0 or higher	Coastal Processes		no	no	no		
ERTH 470	Upper-division standing; [ERTH 170 or EARTH 172 or EARTH 270] and PHYS 220; GPA of 3.0 or higher	Physical Oceanography		no	no	no		

Select one class from the following (GWAR options)

BIOL 344GW	Biol 230 + Biol 240 + GE Area 2, GPA 3.0 or higher	Research Skills - GWAR		no	no	no		
BIOL 475GW	Biol 230 + Biol 240 + GE Area 2	Herpetology - GWAR		no	yes	no		
BIOL 478GW	Biol 230 + Biol 240 + GE Area 2	Ornithology - GWAR (4)		no	yes	no		
BIOL 570GW	Biol 230 + Biol 240 + GE Area 2	Biology of Fishes - GWAR (4)		no	no	no		
BIOL 670GW*	GE Area A2 + BIOL 240 + BIOL 458 with grades of C or better; concurrent enrollment in BIOL 671 + [BIOL 699 or BIOL 897]	Ecology and Evolution of Marine Systems I - GWAR (6)		no	no	no		

Units selected from the following (6 - 7 units):

Courses used to satisfy the electives above may not be double-counted here.

			Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 315	Biol 240 + Biol 458 (with grades C or better); GPA 3.0 or better	Field Methods in Ecology and Evolution (1)		no	no	yes		
BIOL 349	GE Areas A1*, A2*, A3*, and B4*	Bioethics		no	no	no		
BIOL 350	Biol 230 + Biol 240 + Chem 115	Cell Biology		yes	yes	yes		
BIOL 356	Biol 355 with a grade of B or better	Honors Genetics (2)		yes	yes	no		
BIOL 357	Biol 355	Molecular Genetics		yes	yes	no		
BIOL 380	Biol 355 (Biol 337 is recommended)	Evolutionary Developmental Biology		no	yes	no		
BIOL 382	Biol 350 + Biol 355, GPA 3.0 or higher	Developmental Biology		yes	yes	no		
BIOL 391	One college-level physics course	Microscopy and Photomicrography (2)		no	no	no		
BIOL 401	Biol 230 + Biol 240 + Chem 233	General Microbiology		yes	yes	no		
BIOL 411	Biol 355 + BIOL 401 + BIOL 402GW + [CHEM 340 or CHEM 349]	Environmental Microbiology		no	no	no		
BIOL 460	Biol 230 + Biol 240	General Entomology (4)		no	no	no		
BIOL 470	Biol 230 + Biol 240	Natural History of Vertebrates (4)		no	yes	no		

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				Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 482	Biol 230 + Biol 240	Ecology (4)		yes	yes	no		
BIOL 502	Biol 230 + Biol 240, GPA 3.0 or higher	Biology of the Algae		no	no	no		
BIOL 525	Biol 230 + Biol 240 + Chem 130	Plant Physiology		yes	yes	no		
BIOL 526	Biol 230 + Biol 240 + Chem 130	Plant Molecular Physiology Laboratory (2)		no	yes	no		
BIOL 530	Biol 230 + Biol 240	Conservation Biology		yes	no	no		
BIOL 532	Biol 230 + Biol 240	Restoration Ecology		yes	no	no		
BIOL 534	Biol 230 + Biol 240	Wetland Ecology (4)		no	yes	no		
BIOL 555	Biol 230 + Biol 240	Marine Invertebrate Zoology (4)		no	no	no		
BIOL 556	Biol 230 + Biol 240	Natural History of Marine Invertebrates (4)		no	no	no		
BIOL 572	Upper-division standing; GPA of 3.0 or higher	Colloquium in Ecology, Evolution, and Conservation (2)		no	no	no		
BIOL 580	Biol 230 + Biol 240 + Chem 215 + Chem 216; ecology course recommended	Limnology		no	no	no		
BIOL 582	Biol 230 + Biol 240	Biological Oceanography (4)		yes	yes	no		
BIOL 585	Biol 230 + Biol 240	Marine Ecology		yes	yes	no		
BIOL 586	Biol 585 (may be taken concurrently)	Marine Laboratory (2)		no	no	no		
BIOL 600	Biol 230 + Biol 240	Animal Behavior		no	yes	no		
BIOL 607	Biol 230 + Biol 240 + Biol 355	Conservation and Management of Marine Mammals		no	no	no		
BIOL 617	Biol 612 or Biol 630	Environmental Physiology		no	no	no		
BIOL 630	Biol 230 + Biol 240 + [Chem 130 or Chem 233]	Animal Physiology		yes	yes	no		
BIOL 631GW	GE Area 2 + Biol 612 or Biol 630	Animal Physiology Laboratory - GVAR (4)		yes	no	no		
BIOL 644	Biol 230 + Biol 240 + [Biol 350 or Biol 355 or Biol 357]	LEADerS Service Learning Course: Learners Engaged in Advocating for Diversity in Science (4)		no	no	no		
OR BIOL 654	Biol 230	Peer Assistants for Learning Science (4)		yes	yes	no		
BIOL 670GW*	GE Area A2 + BIOL 240 + BIOL 458 with grades of C or better; concurrent enrollment in BIOL 671 + [BIOL 699 or BIOL 897]	Ecology and Evolution of Marine Systems I - GVAR (6)		no	no	no		
BIOL 671	BIOL 240 + BIOL 458 with grades of C or better; concurrent enrollment in BIOL 670GW + [BIOL 699 or BIOL 897]	Ecology and Evolution of Marine Systems II (6)		no	no	no		
BIOL 699	Restricted to senior Biology majors; consent of the department and instructor.	Independent Study in Biology (1-3 units) <i>requires faculty mentor's approval</i>		yes	yes	no		
GEOG 629	Geog 603	Coastal and Marine Applications of GIS		no	no	no		
MSCI 306	see http://bulletin.sfsu.edu/courses/msci/	Marine Science Diving and Boating (2)		no	no	no		

*Note: cannot double count Biol 670GW to meet both GVAR and UD elective requirements

Course Num.	Course Title	Units

What course has student taken to meet GVAR?

GVAR course must be completed with a C- or better to meet graduation requirements

	Required	Completed
Total upper division unit requirements :	22-27	_____
Total units for major (minimum 59 units)	57-62	_____

Recommendations for targeted post-graduate plans

Health profession

Students must take Chem 215/216
 Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.
 Students must take Phys 121/122.

Graduate programs

Students must take Chem 215/216
 Students should take full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.
 Students should take the full year of biochemistry: Chem 340 and Chem 341
 Students must take Phys 121/122.
 Student should consult with major advisor to optimize course plan for goals.

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LD=_____
 UD=_____

Student: _____
Last First
 Advisor: _____

E-mail _____
 Phone _____

BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN MICROBIOLOGY

Course is 3 units unless otherwise noted.

Lower Division Requirements (34-37 units)

Class	Prerequisites (must be completed with a C- or better, unless otherwise stated; however, Chemistry prerequisite courses must be completed with a C or better)	Class Name	Units	Units			v	on DPR?
				Fa 21	Sp 22	Su 22		
BIOL 230		Introductory Biology I	5	yes	yes	no		
BIOL 231		Advising for Success as a Biology Major	1	yes	yes			
BIOL 240	Biol 230	Introductory Biology II [Meets GE Areas B2 (Life Science) & B3 (Lab Science)]	5	yes	yes	no		
CHEM 115	see http://bulletin.sfsu.edu/courses/chem/	General Chemistry I: Essential Concepts of Chemistry	5	yes	yes	no		
CHEM 215	Chem 115	General Chemistry II: Quant. Appl. of Chem. Conc. (3)	3	yes	yes	yes		
MATH 226 ¹	see http://bulletin.sfsu.edu/courses/math/	Calculus I	4	yes	yes	yes		
PHYS 111/112 ¹	see http://bulletin.sfsu.edu/courses/phys/	General Physics I/Laboratory (3/1)	4	yes	yes	yes		
PHYS 121/122 ¹	see http://bulletin.sfsu.edu/courses/phys/	General Physics II and Laboratory (3/1)	4	yes	yes	yes		
<i>Select one organic chemistry¹ sequence (3-6 units):</i>			3 - 6					
CHEM 130	Chem 115	General Organic Chemistry [meets GE Area B1]		yes	yes	yes		
CHEM 233 and CHEM 335	see http://bulletin.sfsu.edu/courses/chem/	Organic Chemistry I [meets GE Area B1] and Organic Chemistry II		yes	yes	yes		
Total lower division requirements (units):			34-37					

Upper Division Requirements (15 units)

BIOL 337	Biol 230 + Biol 240 + Biol 355	Evolution	3	yes	yes	no		
BIOL 355 ²	Biol 230 + Biol 240 + Chem 115	Genetics [meets GE UD-B requirement]	3	yes	yes	yes		
BIOL 401	Biol 230 + Biol 240 + Chem 233	General Microbiology	3	yes	yes	no		
BIOL 402GW	Biol 401 (may be taken concurrently) + GE Area 2	General Microbiology Laboratory - GWARD	3	yes	yes	no		
<i>Biochemistry course¹ selected from the following (3 units):</i>			3					
CHEM 340	Chem 215 + Chem 233 + Chem 335 with grades of C or better	Biochemistry I		yes	yes	no		
CHEM 349	Chem 215 (grade C or better) + [Chem 130 (grade C or better) or Chem 335 (grade of C- or better)]	General Biochemistry		yes	yes	yes		
Upper Division Requirements (units)			15					

Upper Division Electives (11 units)

Upper division electives in Microbiology: Select 11 units from the following courses, including at least two laboratory courses with approval of an advisor

Class	Prerequisites	Class Name	Units	Units			v	on DPR?
				Fa 21	Sp 22	Su 22		
BIOL 420 ²	Biol 401 + Biol 402GW	General Virology		no	yes	no		
BIOL 425	Biol 230 + Biol 240 + [Biol 355 or Biol 401 or Biol 350] + Chem 130	Emerging Diseases		no	yes	no		
BIOL 430 ¹	Biol 401 with a C or better	Medical Microbiology		yes	no	no		
BIOL 435 ¹	Biol 350 or Biol 401	Immunology		no	yes	no		
BIOL 442	Biol 401 + Biol 402GW + Chem 349	Microbial Physiology		yes	no	no		
BIOL 453 ²	Biol 230 + Biol 240 + Biol 355	General Parasitology		yes	no	no		
BIOL 644	Biol 230 + Biol 240 + [Biol 350 or Biol 355 or Biol 357]	LEADerS Service Learning Course: Learners Engaged in Advocating for Diversity in Science (4)		no	no	no		
OR BIOL 652	[Biol 230 + Biol 240] OR one upper division biology course	Science Education Partners in Biology (4)		no	no	no		
<i>Select two laboratory courses from the following:</i>								
BIOL 431 ²	Biol 401 + Biol 402GW + Chem 349	Medical Microbiology Lab (2)		no	yes	no		
BIOL 436 ²	Biol 402GW, concurrent enrollment in Biol 435	Immunology Laboratory (2)		no	no	no		
BIOL 443	Biol 442 (may be taken concurrently)	Microbial Physiology Laboratory (2)		no	no	no		
BIOL 446	Biol 401 + Biol 402GW + Biol 355	Microbial Genomics (4)		yes	no	no		
BIOL 454 ²	Biol 453 (may be taken concurrently)	General Parasitology Laboratory (1)		yes	no	no		

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			Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 490	Biol 230 + Biol 240	Ecology of Infectious Diseases (4)	no	no	no		
BIOL 625 ¹	one college-level physiology course	Hematology	yes	yes	no		
BIOL 638	Biol 230, GPA 3.0 or higher	Bioinformatics & Genome Annotation (4)	no	yes	no		
BIOL 699	Restricted to senior Biology majors; consent of the department and instructor.	Independent Study in Biology (1-3 units) <i>requires faculty mentor's approval</i>	yes	yes	no		
CHEM 336	see http://bulletin.sfsu.edu/courses/chem/	Organic Chemistry II Laboratory (2)	yes	yes	yes		
OR CHEM 343 ²	see http://bulletin.sfsu.edu/courses/chem/	Biochemistry I Laboratory	yes	yes	yes		

¹ Required for admission to Clinical Laboratory Science graduate programs.

² Recommended for admission to Clinical Laboratory Science graduate programs.

Course Num.	Course Title	Units

What course has student taken to meet GVAR? (Typically Biol 402GW)

GVAR course must be completed with a C- or better to meet graduation requirements

	Required	Completed
Total upper division unit requirements:	26	_____
Total units for major (minimum 60 units)	60-63	_____

Recommendations for targeted post-graduate plans

Health profession Students must take Chem 216
 Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.

Graduate programs Students must take Chem 216
 Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.
 Students should take the full year of biochemistry: Chem 340 and Chem 341
 Student should consult with major advisor to optimize course plan for goals.

Clinical Laboratory Science Program

Note the courses indicated in the checklist as required or recommended for CLS graduate programs
 CLS graduate programs require a minimum 3.0 GPA.
 Students should take Chem 130 (General Organic Chemistry, 3 units) and Chem 349 (General Biochemistry, 3 units)
 Students must take the following courses as their upper division ELECTIVES in Microbiology concentration
 BIOL 430 (Medical Microbiology, 3 units)
 BIOL 435 (Immunology, 3 units)
 BIOL 625 (Hematology, 3 units)
 Students should take the following courses (not part of the major) required for CLS program:
 CHEM 321 & 322 (Quantitative Chemical Analysis + Lab, 3/2 units)
 Biol 612 (Human Physiology, 3 units)

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LD= _____

Student: _____

E-mail _____

UD= _____

Last First

Advisor: _____

Phone _____

BACHELOR OF SCIENCE IN BIOLOGY: CONCENTRATION IN PHYSIOLOGY

Course is 3 units unless otherwise noted.

Lower Division Requirements (34-37 units)

Class	Prerequisites (must be completed with a C- or better, unless otherwise stated; however, Chemistry prerequisite courses must be completed with a C or better)	Class Name	Units	Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 230		Introductory Biology I	5	yes	yes	no		
BIOL 231		Advising for Success as a Biology Major	1	yes	yes			
BIOL 240	Biol 230	Introductory Biology II [Meets GE Areas B2 (Life Science) & B3 (Lab Science)]	5	yes	yes	no		
CHEM 115	see http://bulletin.sfsu.edu/courses/chem/	General Chemistry I: Essential Concepts of Chemistry	5	yes	yes	no		
CHEM 215	Chem 115	General Chemistry II: Quant. Appl. of Chem. Conc. (3)	3	yes	yes	yes		
MATH 226	see http://bulletin.sfsu.edu/courses/math/	Calculus I	4	yes	yes	yes		
Select one organic chemistry sequence (3-6 units):								
CHEM 130	Chem 115	General Organic Chemistry [meets GE Area B1]		yes	yes	yes		
CHEM 233 and CHEM 335	see http://bulletin.sfsu.edu/courses/chem/	Organic Chemistry I [meets GE Area B1] and Organic Chemistry II		yes	yes	yes		
Select one physics sequence (8 units):								
PHYS 111/112	see http://bulletin.sfsu.edu/courses/phys/	General Physics I and Laboratory (3/1) and		yes	yes	yes		
PHYS 121/122	see http://bulletin.sfsu.edu/courses/phys/	General Physics II and Laboratory (3/1)		yes	yes	yes		
OR		OR						
PHYS 220/222	see http://bulletin.sfsu.edu/courses/phys/	General Physics with Calculus I and Laboratory (3/1) and		yes	yes	yes		
PHYS 230/232	see http://bulletin.sfsu.edu/courses/phys/	General Physics with Calculus II and Laboratory (3/1)		yes	yes	yes		
Total lower division requirements (units):			34 - 37					

Upper Division Requirements (15-16 units)				Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 337	Biol 230 + Biol 240 + Biol 355	Evolution	3	yes	yes	no		
BIOL 355	Biol 230 + Biol 240 + Chem 115	Genetics [meets GE UD-B requirement]	3	yes	yes	yes		
Select one physiology lecture (3 units):			3					
BIOL 612	Biol 230 + Biol 240 + Chem 130 + Phys 121	Human Physiology		yes	yes	yes		
BIOL 630	Biol 230 + Biol 240 + [Chem 130 or Chem 233]	Animal Physiology		yes	yes	no		
Select one physiology lab (3-4 units):								
BIOL 613GW	GE Area 2 + [Biol 612 or Biol 630 (may be taken concurrently)]	Human Physiology Laboratory - GVAR		yes	yes	yes		
BIOL 631GW	GE Area 2 + Biol 612 or Biol 630	Animal Physiology Laboratory - GVAR (4)		yes	no	no		
Select one biochemistry course (3 units):			3					
CHEM 340	Chem 215 + Chem 233 + Chem 335 with grades of C or better	Biochemistry I		yes	yes	no		
CHEM 349	Chem 215 (grade C or better) + [Chem 130 (grade C or better) or Chem 335 (grade of C- or better)]	General Biochemistry		yes	yes	yes		
Upper Division Requirements (units)			15-16					

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Upper Division Electives (10 units)

Select 10 units from the classes below; at least 6 units must be chosen from among the Group A courses.

Group A courses			Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 328	Biol 230	Human Anatomy (4)	yes	yes	no		
BIOL 350	Biol 230 + Biol 240 + Chem 115	Cell Biology	yes	yes	yes		
BIOL 616	Biol 230 + Biol 240 + Phys 121 + [Biol 612 or Biol 630]	Cardiorespiratory Physiology	yes	yes	no		
BIOL 617	Biol 612 or Biol 630	Environmental Physiology	no	no	no		
BIOL 618	[Biol 212 or Biol 612] + Biol 350 + Biol 355	Biology of Aging	no	no	no		
BIOL 620	Biol 230 + Biol 240	Endocrinology	yes	yes	no		
BIOL 621	Biol 230 + Biol 240 + Biol 330 + Chem 130; Biol 492 or a vertebrate anatomy course recommended	Reproductive Physiology	yes	no	yes		
BIOL 622	Biol 230 + Biol 240	Hormones and Behavior	no	yes	no		
BIOL 623	Biol 230 + Biol 240 + Biol 612 + Chem 130, GPA 3.0 or higher	Pharmacology	no	yes	no		
BIOL 640	Biol 230 + Biol 240 + Chem 130 + Phys 121; Biol 350 and Biol 612 recommended	Cellular Neurosciences	yes	no	no		
BIOL 642	Biol 328 or Biol 612	Neural Systems Physiology	no	yes	no		

Group B courses			Fa 21	Sp 22	Su 22	v	on DPR?
BIOL 435	Biol 350 or Biol 401	Immunology	yes	yes	no		
BIOL 453	Biol 230 + Biol 240 + Biol 355	General Parasitology	yes	no	no		
BIOL 454	Biol 453 (may be taken concurrently)	Parasitology Laboratory (1)	yes	no	no		
BIOL 525	Biol 230 + Biol 240 + Chem 130	Plant Physiology	yes	yes	no		
BIOL 526	Biol 230 + Biol 240 + Chem 130	Plant Molecular Physiology Laboratory (2)	no	yes	no		
BIOL 615	Biol 230 + Biol 240 + Biol 612	Molecular Pathophysiology	no	no	no		
BIOL 644	Biol 230 + Biol 240 + [Biol 350 or Biol 355 or Biol 357]	LEADerS Service Learning Course: Learners Engaged in Advocating for Diversity in Science (4)	no	no	no		
OR BIOL 652	[Biol 230 + Biol 240] OR one upper division biology course	Science Education Partners in Biology (4)	no	no	no		
OR BIOL 654	Biol 230	Peer Assistants for Learning Science (4)	yes	yes	no		
BIOL 699	Restricted to senior Biology majors; consent of the department and instructor.	Independent Study in Biology (1-3 units) <i>requires faculty mentor's approval</i>	yes	yes	no		

Course Num.	Course Title	Units

What course has student taken to meet GEAR?

GEAR course must be completed with a C- or better to meet graduation requirements

	Required	Completed
Total upper division unit requirements :	25-26	_____
Total units for major (minimum 59 units)	59-63	_____

Recommendations for targeted post-graduate plans

Health profession

Students must take Chem 216
 Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.

Graduate programs

Students must take Chem 216
 Students must take the full year of organic chemistry with lab: Chem 233/234 and Chem 335/336.
 Students should take the full year of biochemistry: Chem 340 and Chem 341
 Student should consult with major advisor to optimize course plan for goals.

Department of Biology Graduation Checklist
<https://biology.sfsu.edu/advising/undergraduate>

LD= _____ Student: _____ E-mail _____
 UD= _____ Last First
 Advisor: _____ Phone _____

MINOR IN BIOLOGY*

Required courses (18 units)		Units	√	on DPR?
BIOL 230	Introductory Biology I (LD)	5		
BIOL 240	Introductory Biology II (LD)	5		
CHEM 115	General Chemistry I: Essential Concepts of Chemistry (LD)	5		
BIOL 355	Genetics	3		
Total required units:		18		

Additional elective courses (6 units) √ on
DPR?

One course from the following (3 units):

BIOL 337	Evolution			
CHEM 130	General Organic Chemistry (LD)			
CHEM 233	Organic Chemistry I (LD)			

One course from the following (3 units):

BIOL 350	Cell Biology			
BIOL 380	Evolutionary Developmental Biology			
BIOL 425	Emerging Diseases			
BIOL 453	General Parasitology			
BIOL 525	Plant Physiology			
BIOL 530	Conservation Biology			
BIOL 532	Restoration Ecology			
BIOL 585	Marine Ecology			
BIOL 600	Animal Behavior			
BIOL 607	Conservation and Management of Marine Mammals			
BIOL 620	Endocrinology			
BIOL 622	Hormones and Behavior			

Total elective units: 6

Course Num.	Course Title	Units

**Upper Division/Residence Units. At least half of the units making up the minor must be taken in residence, and minor must have a minimum of 6 upper division units.*

	Required	Completed
Total lower division required units	15	_____
Total upper division required units	3	_____
Total elective units	6	_____
Total lower division elective units		_____
Total upper division elective units		_____
Total units for minor	24	_____