

2011-13 Cal Poly Catalog

Biological Sciences Department

BS BIOLOGICAL SCIENCES

☐ 60 units upper division ☐ GWR
☐ 2.0 GPA ☐ USCP

* = Required in Major/Support; also satisfies GE

Course sequencing: See flowcharts at csmadvising.calpoly.edu

Note: No major, support or concentration courses may be taken as credit/no credit.

MAJOR COURSES

BIO 160 Diversity & the History of Life	4
BIO 161 Intro to Cell & Molecular Bio (B2&B4)*	4
BIO 162 Intro to Organismal Form & Function	4/5
BIO 263 Introductory Ecology and Evolution.....	4
BIO 351 Principles of Genetics	5
BIO 414 Evolution	4
BIO 461 Senior Project – Research Proposal <i>or</i>	
BIO 462 Senior Project – Research	2
¹ Biological Diversity:	4
BIO 415; BOT 313, 323, 433, 437; MCRO 224,	
402; MSCI 324; ZOO 321, 322, 323, 329, 335,	
336, 341, 425 (6/9/15)	
Ecology: BIO 325, 327, 328, 401, 445, 446; BOT	
326; MCRO 436 (9/26/13).....	4
² Physiology: BIO 361, 434, 435	4
^{3,4} Concentration or General Curriculum in Biology....	38-39
(9/24/12)	78-77-79

SUPPORT COURSES

CHEM 127 General Chemistry (B3&B4)*	4
CHEM 128, 129 General Chemistry	4, 4
⁵ CHEM 312 Survey of Organic Chemistry <i>or</i>	
CHEM 216 Introduction to Organic Chemistry I	
<i>or</i> CHEM 316 Organic Chemistry I (7/13/12).....	5
MATH 161, 162 Calculus/Life Sciences I, II (B1)*	4, 4
PHYS 121, 122, 123 College Physics I, II, III....	4, 4, 4
STAT 218 Appl Statistics-Life Sciences (B1)*	4
	41

GENERAL EDUCATION (GE)

72 units required, 16 of which are specified in Major/Support.

→See page 39 for complete GE course listing.

→Minimum of 12 units required at the 300 level.

Area A Communication (12 units)

A1 Expository Writing	4
A2 Oral Communication	4
A3 Reasoning, Argumentation, and Writing.....	4

Area B Science and Mathematics (no add'l units req'd)

B1 Mathematics/Statistics * 8 units in Support.....	0
B2 Life Science * 4 units in Major	0
B3 Physical Science * 4 units in Support	0
B4 One lab taken with either a B2 or B3 course	
* in Major	

Area C Arts and Humanities (20 units)

C1 Literature	4
C2 Philosophy	4
C3 Fine/Performing Arts	4

C4 Upper-division elective	4
Area C elective (Choose one course from C1-C4)	4

Area D/E Society and the Individual (20 units)

D1 The American Experience (40404)	4
D2 Political Economy	4
D3 Comparative Social Institutions	4
⁶ D4 Self Development (CSU Area E)	4
D5 Upper-division elective	4

⁶Area F Technology Elective (upper division)(4 units)

4

56

FREE ELECTIVES

4-6 5

180

GENERAL CURRICULUM IN BIOLOGY or CONCENTRATIONS (select one)

General Curriculum in Biology

CHEM 313 Survey of Biochem and Biotech <i>or</i>	
CHEM 371 Biochemical Principles	5
Anatomy/Physiology (Select at least 1 course)	4-5
BIO 361, 432, 433, 434, 435;	
MCRO 424; ZOO 422	
Botany (Select at least 1 course).....	4
BOT 311, 313, 323, 324, 335, 431, 433, 437	
Ecology/Evolution/Conservation (Select at least	
1 course).....	3-4
BIO 325, 327, 328, 401, 415, 419, 427, 428,	
438, 439, 443, 444, 445, 446; (12/3/13)	
BOT 326; MCRO 436; MSCI 301, 303, 401,	
410; ZOO 437 <i>or</i> BIO 442 (10/29/13)(7/16/15)	
Microbiology (Select at least 1 course).....	3-5
MCRO 224, 225, 301, 320, 342, 421, 423,	
433; ZOO 425	
Molecular/Cellular Biology (Select at least 1	
course).....	3-4
BIO 405, 426, 452;	
BIO/CHEM 375, 441, 476;	
BOT/HCS 450;	
MCRO 402; ZOO 428	
Zoology (Select at least 1 course).....	4
ZOO 321, 322, 323, 329, 335, 336, 341	
Research, Projects and Seminars.....	0-6
BIO 200, 330, 400, 440, 450, 461, 462, 463,	
470, 471, 472; SCM 302 (12/3/13)(7/23/15)	

¹ Biology concentration should take MCRO 224 to fulfill this requirement.

² Students in the Anatomy and Physiology concentration and in the Biology Teaching concentration should take BIO 361 to fulfill this requirement.

³ Note that courses in concentrations or the general curriculum may not double-count in the major core.

⁴ Maximum of 6 units may be applied toward the major from the following courses: BIO 400, BIO 450, BIO 462, BIO 463.

⁵ Students in the Molecular and Cellular Biology concentration should take CHEM 216 or 316 to fulfill this requirement. (7/9/12)

⁶ To meet credentialing requirements, it is recommended teaching students take KINE 250 to fulfill GE D4, and SCM 330 to fulfill GE Area F.

^{1,4} <i>Approved Electives</i> 2-13 (<i>Select additional courses in any of the areas listed or request faculty advisor approval for other courses with a maximum allowed of 8 units of coursework outside of the department</i>) BIO 406, 407, 408, 409, 461 (7/16/15)(7/23/15)	39	<i>Global Ecology (select 1 course)</i> 4 BIO 415, GEOG 250, 333; UNIV 350 <i>Methodology (select 3 courses)</i> 10-12 BIO/CHEM 375, BIO 419, BIO 443, LA/NR 318 or GEOG 318, STAT 313, STAT 419 (4/27/16)
Anatomy and Physiology Concentration		^{1,4} <i>Approved electives</i> 10-14 <i>Select courses from the above five lists in this concentration, or from the Biological Diversity list of courses in the major core, or from the following:</i> BIO 330, 361, 400, 427, 441, 462, 463, 472; BOT 311, 313, 323, 437; GEOG 440; MCRO 224, 402; NR 307, 311, 418, 421; SCM 302; SS 121, 321, 322, 421, 422; ZOO 321, 322, 323, 329, 335, 336, 341, 425 (3/13/13)(4/24/14)(7/23/15)(3/17/16)
BIO 432 Vertebrate/Human Anatomy & Phys I..... 5	5	
BIO 433 Vertebrate/Human Anatomy & Phys II..... 5	5	
BIO 452 Cell Biology..... 4	4	
CHEM 371 Biochemical Principles <i>or</i> CHEM 313 Survey of Biochemistry and Biotechnology 5	20	
^{1,4} <i>Approved electives</i> 20 <i>Select 20 units from the following:</i> <i>8 units minimum from:</i> BIO/CHEM 375; BIO 405, BIO 407 or ASCI 405, BIO 406, 408, 409, 410, 426, 434, 435; MCRO 225, 320, 342, 402, 423, 424; ZOO 422, 425, 428 <i>11 units maximum from:</i> CHEM 217, 218, 220, 223, 317, 318, 372 <i>8 units maximum from:</i> ANT 401; ASCI 351, 406, 438; BIO 400, 461, 462, 463; COMS 418, FSN 310, 429; KINE 406, 445, 446; PHIL 339 <i>or</i> 341; PSY 320, 340; SCM 302, 451 <i>or</i> PHIL 341 (7/9/12)(3/13/13)(6/10/15)(7/23/15)(8/24/15)(12/17/15)	39	Field and Wildlife Biology Concentration BOT 313 Taxonomy of Vascular Plants 4 BOT 433 Field Botany 4 ZOO 321 Mammalogy 4 ZOO 323 Ornithology 4 ZOO 341 Herpetology 4 Emphasis Area (select Field or Wildlife) 19 <i>Field Biology Emphasis</i> ZOO 335 General Entomology (4) ZOO 437 Animal Behavior (4) BIO 439/ZOO 322 (4) ¹ <i>Approved electives (Select 7 units from):</i> BIO 325, 327, 328, 330, 400, 401, 415, 419, 427, 439, 434, 443, 444, 445, 446, 461, 462, 463; (4/24/24)(12/17/15) BOT 326, 437; LA/NR 318; NR 141, 142, 203, 307, 404, 416; MCRO 402; SS 121, 321, 322; SCM 302 (3/13/13) STAT 313, 324, 330, 416, 419, 421; ZOO 322, 329, 335, 336, 425, 437 ³ <i>Wildlife Biology Emphasis</i> BIO 327 Wildlife Ecology (4) BIO 427 Wildlife Management (4) BIO 444 Population Ecology (3) <i>or</i> BIO 401 Conservation Biology (4) ¹ <i>Approved electives. Select 7-8 units from the approved electives list above in the Field Biology Emphasis</i>
² Biology Teaching Concentration		
BIO 432 Vertebrate/Human Anatomy/Phys I..... 5	5	
BIO 433 Vertebrate/Human Anatomy/Phys II..... 5	5	
BIO 452 Cell Biology..... 4	4	
BIO/PSC 424 Organizing/Teaching Science 4	4	
MCRO 320 Emerging Infectious Diseases 3	3	
SCM 300 Early Field Experience, Science/Math ... 4	4	
SCM 451 Ethics in the Sciences (3) <i>or</i> 3-4 PHIL 339 Biomedical Ethics (4), PHIL 340 Environmental Ethics (4) <i>or</i> SCM 325 Genetic Engineering Technology (4) ..	10-11	
¹ <i>Approved electives</i> 10-11 <i>Select 11 units from the following:</i> BIO 328, 330, 361, 375, 400, 401, 415, 427, 434, 435, 445, 446, 450, 461, 462, 463, 472; BOT 311, 313, 323, 326, 335, 433, 437; NR 311, 421; MCRO 225, 421, 424, 433; SS 121, 421, 422; ZOO 321, 322, 323, 329, 335, 336, 341, ZOO 437 <i>or</i> BIO 442 (10/29/13)(10/3/12)(4/24/14) (12/17/15)	39	
Ecology Concentration		Marine Biology and Fisheries Concentration BIO 328 Marine Ecology 4 ¹ Consultation with advisor is recommended prior to selecting approved electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or goals. ² To meet credentialing requirements, it is recommended teaching students take KINE 250 to fulfill GE D4, and SCM 330 to fulfill GE Area F. ³ Students seeking Wildlife Biologist Certification should see faculty advisor for assistance. ⁴ If any of these courses is taken to meet a major or support requirement in the degree, it cannot be double-counted as an approved elective. (7/23/15)
<i>Ecology of the Individual (select 1 course)</i> 4-5 BIO 434, 435; MCRO 424; ZOO 437 <i>Population Ecology (select 1 course)</i> 3-4 BIO 327, 401, 439, 444 <i>Community Ecology (select 1 course)</i> 4 BIO 325, 328; BOT 326, 433; MCRO 436	39	

BIO/CHEM 375 Molecular Biology Laboratory	3
BOT 437 Psychology Marine Plants	4
STAT 313 App Exp Design/Regression Models.....	
ZOO 322 Ichthyology.....	4
ZOO 336 Invertebrate Zoology	4 4
<i>Change effective Spring 2012</i>	4
^{1,4} Approved electives	16
<i>Select at least 8 units from:</i>	
BIO 325, 327, 400, 401, 405, 419, 434, 435, 438, 439, 440, 442, 445, 446, 443, 444, 452, 461, 462, 463; MSCI 301, 303, 401, 410 MCRO 436; ZOO 321, 323, 324, 425, 437	
<i>Select no more than 8 units from:</i>	
CHEM 217, 302, 317, 313 or 371, 341, 474; PSC 201; SCM 302 (3/13/13) (7/9/12)(6/24/14)(7/16/15)(7/23/15)	39

Molecular and Cellular Biology Concentration

BIO/CHEM 375 Molecular Biology Laboratory.....	3
BIO 452 Cell Biology.....	4
CHEM 217 Organic Chemistry for Life Sciences II (4) or CHEM 317 Organic Chemistry II (5) <i>or</i> CHEM 217 Organic Chemistry II (3) and CHEM 220 Organic Chemistry Laboratory for Life Sciences (1) <i>or</i> CHEM 217 Organic Chemistry II (3) and CHEM 221 Organic Chemistry Laboratory II (2) (7/27/15)....	4-5
CHEM 371 Biochemical Principles	5
CHEM 372 Metabolism	4
^{2, 3} CHEM 474 Protein Techniques Laboratory <i>or</i> BIO/CHEM 476 Gene Expression Laboratory	2
Choose 8 units from the following.....	8
BIO 405, 426; BIO/CHEM 441, BIO/CHEM 476 or CHEM 474; BOT 450; MCRO 402, 433; SCM 201	
^{1,4} Approved electives.....	8
<i>Select 8 units from:</i>	
List A	
BIO 400 [†] , 405, 406, 407, 408, 409, 426, 432, 433, 435, 461, 462, 463; BIO/CHEM 441; BIO/CHEM 476 or CHEM 474; BOT 323, 450; MCRO 320, 402, 423, 424, 433; ZOO 422, 425, 428	
List B (<i>Only one course from List B</i>)	
ASCI 403, 406; CHEM 218, 318, 331, 377, 472, 477, 478, 528; SCM 201, 302, 451 (7/9/12)(3/13/13)(7/16/15)(7/23/15)	38-39

¹ Consultation with advisor is recommended prior to selecting approved electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or goals.

² The course selected to satisfy this requirement may not be used to satisfy electives in the concentration.

³ If CHEM 474 is taken for 3 units the extra unit will count towards Approved Electives. (7/16/15)

⁴ If any of these courses is taken to meet a major or support requirement in the degree, it cannot be double-counted as an approved elective. (7/23/15)

[†] Total credit limited to 4 units.