

2009-11 Cal Poly Catalog

Biological Sciences DepartmentFlowcharts**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.....	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 328, 415; BOT 313, 323, 433, 437; MCRO 224, 402; ZOO 321, 322, 323, 329, 335, 336, 341, 425	
Ecology: BIO 325, BOT 326; MCRO 436.....	4
² Physiology: BIO 361, 434, 435	4
Concentration	39
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SUPPORT COURSES

CHEM 127 General Chemistry (B3&B4)*	4
CHEM 128, 129 General Chemistry	4, 4
³ CHEM 312 Survey of Organic Chemistry <i>or</i> CHEM 316 Organic Chemistry I	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 50 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
D4 Self Development (CSU Area E)	4
D5 Upper-division elective	4

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

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FREE ELECTIVES.....

4

180**⁴ Concentrations (select one)****Anatomy and Physiology Concentration**

BIO 432 Vertebrate/Human Anatomy & Phys I	5
BIO 433 Vertebrate/Human Anatomy & Phys II	5
BIO 452 Cell Biology	4
CHEM 371 Biochemical Principles <i>or</i> CHEM 313 Survey of Biochemistry and Biotechnology	5
⁵ Approved electives	20

Select 20 units from the following; at least 12 units must be from BIO, CHEM, MCRO, ZOO courses:

- ASCI 351, 406;
BIO/CHEM 375;
BIO 400, 405, 426, 434, 435, 463;
CHEM 317, 318, 372;
FSN 310, 429;
KINE 406, 445, 446;
MCRO 225, 320, 342, 402, 423, 424;
PHIL 339;
PSY 340;
SCM 451;
ZOO 422, 425, 428

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¹ Students in the Molecular and Cellular 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 Students in the Molecular and Cellular Biology concentration should take CHEM 316 to fulfill this requirement.

⁴ Guidelines are available for approved electives in most concentrations. See your faculty advisor for assistance.

⁵ 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.

¹ Biology Teaching Concentration

BIO 432 Vertebrate/Human Anatomy/Phys I	5
BIO 433 Vertebrate/Human Anatomy/Phys II	5
BIO 452 Cell Biology.....	4
BIO/PSC 424 Organizing/Teaching Science.....	4
MCRO 320 Emerging Infectious Diseases.....	3
SCM 300 Early Field Experience, Science/Math...	4
SCM 451 Ethics in the Sciences.....	3
² Approved electives.....	11

Select 11 units from the following:

BIO 328, 330, 375, 400, 401, 415, 434, 435,
463, 472;
BOT 311, 313, 323, 326, 335, 433, 437;
MCRO 225, 421, 424, 433;
ZOO 321, 322, 323, 329, 335, 336, 341, 437

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Ecology Concentration

<i>Ecology of the Individual (select 1 course)</i>	4-5
BIO 434, BIO 435, ZOO 437	
<i>Population Ecology (select 1 course)</i>	3-4
BIO 401, BIO 439, BIO 444	
<i>Community Ecology (select 1 course)</i>	4-5
BIO 325, BIO 328, BOT 326, BOT 433, MCRO 436	
<i>Global Ecology (select 1 course)</i>	4
BIO 415, GEOG 250, GEOG 333, UNIV 350	
<i>Methodology (select 3 courses)</i>	10-12
BIO/CHEM 375, BIO 419, BIO 443, LA/NR 318, STAT 313, STAT 419	

² Approved electives.....	14-9
Select courses from the above five lists in this concentration, or from the following: BIO 400, 463, 472; BOT 311; CSC 448; NR 307, 418; SS 321, 322;	

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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 one).....	19

Field Biology Emphasis

ZOO 335 General Entomology (4)
ZOO 437 Animal Behavior (4)
BIO 439/ZOO 322 (4)

² Approved electives (7) Select 7 units from: BIO 325, 327, 328, 330, 400, 401, 415, 419, 427, 439, 434, 443, 444; BOT 326, 437; NR 141, 142, 203, 307, 317, 318, 404, 416; MCRO 402; SS 121, 321, 322; STAT 313, 324, 330, 416, 419, 421; ZOO 322, 329, 335, 336, 425, 437	
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³ Wildlife Biology Emphasis

BIO 327 Wildlife Biology Methods (5)
BIO 427 Wildlife Management (4)
BIO 444 Population Ecology (3) *or*
BIO 401 Conservation Biology (4)

² Approved electives (6-7) Select 6-7 units from the approved electives list above for the Field Biology Emphasis	
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General Biology Concentration

BIO 452 Cell Biology	4
CHEM 313 Survey of Biochem and Biotech <i>or</i> CHEM 371 Biochemical Principles 12/21/09	5
<i>Anatomy/Physiology</i>	4
BIO 361 , BIO 432, BIO 433, BIO 434, BIO 435, BOT 335, MCRO 424, ZOO 422 2/12/10	

<i>Botany</i>	4
BOT 313, BOT 323, BOT 326 , BOT 335, BOT 433, BOT 437 2/12/10	

<i>Microbiology</i>	3-5
BIO 426, MCRO 224, MCRO 225, MCRO 320, MCRO 342, MCRO 402, MCRO 421, MCRO 433, MCRO 436, ZOO 428	

<i>Zoology</i>	4
BIO 328, ZOO 321, ZOO 322, ZOO 323, ZOO 329, ZOO 335, ZOO 336, ZOO 341, ZOO 425	

² Approved electives	15-13
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Select from:

BIO 328, 400, 401, 405, 415, 426, 432, 433,
434, 435, 463, 472;
BOT 311, 313, 323, 326, 335, 433, 437;
CHEM 317;
MCRO 224, 225, 320, 342, 402, 421, 424,
433, 436;
SCM 451;
ZOO 321, 322, 323, 329, 335, 336, 341, 422,
425, 428

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¹ To meet credentialing requirements, it is recommended that students take KINE 250 *or* ~~KINE 255~~ to fulfill GE D4, and SCM 330 to fulfill GE Area F. **6/23/09**.

² 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.

³ Students seeking Wildlife Biologist Certification should see faculty advisor for assistance.

Marine Biology and Fisheries Concentration

BIO 328 Marine Biology.....	5
BIO/CHEM 375 Molecular Biology Laboratory	3
BOT 437 Phycology.....	4
STAT 313 Applied Experimental Design and Regression Models	4
ZOO 322 Ichthyology	4
ZOO 336 Invertebrate Zoology.....	4
¹ Approved electives.....	15
<i>Select at least 8 units from:</i>	
BIO 400, 401, 405, 419, 434, 435, 438, 439, 443, 444, 452, 462, 463;	
MCRO 436;	
ZOO 321, 323, 425, 437	
<i>Select no more than 8 units from:</i>	
CHEM 317, 313 or 371; 341, 474;	
PSC 201	

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Molecular and Cellular Biology Concentration

BIO/CHEM 375 Molecular Biology Laboratory	3
BIO 452 Cell Biology	4
CHEM 317 Organic Chemistry II	5
CHEM 371 Biochemistry.....	5
CHEM 372 Metabolism	4
CHEM 474 Protein Techniques Laboratory <i>or</i> BIO/CHEM 476 Gene Expression Laboratory	2
Choose 8 units from the following.....	8
BIO 405, BIO 426, BIO/CHEM 441, BIO/CHEM 476 <i>or</i> CHEM 474, BOT 450, MCRO 402, MCRO 433, SCM 201	
¹ Approved electives.....	8
<i>Select 8 units from:</i>	
List A	
BIO 400, 405, 426, 432, 433, 435, 463;	
BIO/CHEM 441;	
BIO/CHEM 476 <i>or</i> CHEM 474;	
BOT 323, 450;	
MCRO 320, 402, 423, 424, 433;	
ZOO 422, 425, 428	
List B (Only one course from this list without special petition)	
ASCI 403, 406;	
CHEM 318, 331, 377, 472, 477, 478, 528;	
SCM 201, 451	

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Systematics and Biodiversity Concentration

BIO 443 Molecular Ecology & Systematics.....	4
BIO/CHEM 375 Molecular Biology Laboratory	3
BIO 415 Biogeography	4
BIO/CHEM 441 Bioinformatics Applications.....	4
STAT 313 Applied Experimental Design and Regression Models	4
STAT 419 Applied Multivariate Statistics.....	4
¹ Approved biological diversity electives.....	16
<i>Select 16 units from:</i>	
BIO 325, 327, 328, 400, 401, 419, 427, 429, 463, 472;	
BIO/NR 317;	
BOT 311, 313, 323, 326, 433, 437;	
CSC 448;	
NR 307;	
STAT 324, 330, 416, 421;	
ZOO 321, 322, 323, 335, 336, 341, 425	

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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.