

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA
ACADEMIC SENATE

ACADEMIC PROGRAMS COMMITTEE
REPORT TO
THE ACADEMIC SENATE
AP-019-167

Bachelor of Science in Biology for Semesters

Academic Programs Committee

Date: 11/20/2016

Executive Committee
Received and Forwarded

Date: 11/16/2016

Academic Senate

Date: 11/30/2016
First Reading

AP-019-167, Bachelor of Science in Biology for Semesters

BACKGROUND: The Department of Biological Sciences has put forward a revised semester program that combines their previous degree options into a single program in which students can pursue specialized interests via elective courses. This revised and consolidated program will allow students the same academic flexibility that they enjoyed with multiple options under semesters, but will not require the same administrative overhead as maintaining multiple formal options. While there may be some loss of courses that would be of interest to students in other programs, the discontinuation of or consolidation of courses is being handled through the usual curricular process, with appropriate opportunities for input from and consultation with other departments.

RESOURCES CONSULTED:

Deans
Associate Deans
Department Chairs
All Faculty

DISCUSSION:

Before reaching the Academic Programs Committee, this program was reviewed by the College Curriculum Committee in the College of Science as well as the Dean of Science and the Office of Academic Programs. All concerns raised at those levels were addressed. The Academic Programs Committee then conducted campus-wide consultation, as well as its own review of the program. No concerns were raised.

RECOMMENDATION:

The Academic Programs Committee recommends approval of the revised Bachelor of Science in Biology for Semesters.

AP-019-167, Bachelor of Science in Biology for Semesters

Biology, B.S.: 120 units			
Status	active		
Hierarchy Entities	Biological Sciences		
Approval Process Name	I. Program - Q2S Existing Program/Option/Minor		
Current Step	Office of Academic Programs		
Originator	Nancy Buckley		
Created	12/17/2015 11:50AM		
Launched	12/17/2015 12:16PM		
Form			
General Catalog Information			
Department	Biological Sciences		
Conversion Category:	Revised		
Proposal Type:	Program		
Describe or list changes	Eliminated options of General Biology, Botany, Microbiology and Zoology. Instead now just have the Biology major with emphasis. Proposal to discontinue options submitted on Curriculog Form K.		
Semester Program Name (e.g. Biology, B.S., Art History, B.A.)	Biology, B.S.: 120 units		
Program Description	<p>Biology Major The Biology major with emphasis in Botany, Genetics and Molecular Cell Biology, Integrative Biology, Microbiology, Neuroscience and Physiology, and Zoology stresses a balance between the theoretical aspects of biology and actual experience in the field and laboratory. The variety of courses offered in a flexible curriculum provides an opportunity for a wide range of experience in biological sciences.</p>		
Curriculum Sheet	See Biology, B.S._ALY.xlsx		
Roadmap	See attached.		
Two-Year Course Offering	See attached.		
Assessment Plan	See attached.		
Select Program			
Prospective Curriculum			
Steps			
Files	Author	Date	File
	Nancy Buckley	12/17/2015 12:15PM	BIOLOGY Curriculum Sheet.xlsx
	Nancy Buckley	12/17/2015 12:15PM	BIOLOGY Roadmaps.xlsx
	Nancy Buckley	12/17/2015 12:15PM	BiologyBS-Assessment.docx
	Nancy Buckley	12/17/2015 12:16PM	2 Year Course Schedule.docx
	Ashley Ly	09/14/2016 09:42AM	Biology, B.S._ALY.xlsx



California State Polytechnic University, Pomona
Degree Curriculum Sheet

Plan (Major) Biology
Subplan/Option _____

Catalog Year 2015-2019
Minimum Units Required 120

Name _____
Student ID _____

TGA _____
GWT Satisfied Yes No

Required Major Core Courses		
Course		Units
Foundations of Biology: Evolution, Ecology, and Biodiversity	BIO 1220/1220L	3/1
Genetics	BIO 2400	3
Biostatistics Lab	BIO 2110L	1
Cell and Molecular Biology	BIO 3220	3
Principles of Ecology	BIO 3250	3
Principles of Evolution	BIO 3040	3
Foundations of Biology: Energy, Matter, and Information (B2, B3)	BIO 1210/1210L	3/1
Genetics and Human Issues (B5)	BIO 3000	3
or Human Sexuality (B5)	BIO 3010 (3)	
or Biology of the Brain (B5)	BIO 3090 (3)	
or Environment and Society (B5)	BIO 3040 (3)	
or Biology of Human Pregnancy (B5)	BIO 3070 (3)	
or Sexually Transmitted Diseases (B5)	BIO 3030 (3)	
or Marine Biology (B5)	BIO 3130 (3)	
or Biodiversity Conservation (B5)	BIO 3120 (3)	
General Chemistry I (B1, B3)	CHM 1210/1210L	3/1
General Chemistry II	CHM 1220/1220L	3/1
Elements of Organic Chemistry	CHM 2010/2010L	3/1
or Organic Chemistry I	CHM 3140/3140L	(4/1)
Elements of Biochemistry	CHM 3210	3
or Biochemistry I	CHM 3270 (3)	
Stretch Composition II (A2)	ENG 1101	3
or First Year Composition (A2)	ENG 1100 (3)	
Written Reasoning (A3)	ENG 2100	3
Health, Nutrition and the Integrated Being (E)	NTR 2000	3
or Introduction to Psychology (E)	PSY 2201 (3)	
or Mind, Brain & Behavior: Integrated View (E)	PSY 2210 (3)	
or Sci. and Mathematics: Freshmen Exp. (E)	SCI 1010/1010A	(3)
Calculus for Life Sciences (B4)	MAT 1200	3
Physics of Motion, Fluids, and Heat	PHY 1210/1210L	3/1
Physics of Electromagnetism, Circuits, and Light	PHY 1220/1220L	3/1
Biostatistics (B4)	STA 1300	3
Total Units		62-63

Elective Core Courses		
Course		Units
Any combination of courses from the six emphases of electives would satisfy this requirement. See the next page for emphases and courses. In consultation with an advisor, select and follow an emphasis that best fits your career goals. In addition, up to 2 units of BIO 4410 and/or BIO 4610 and one unit of BIO 4620 may count towards core electives.		27
Approved electives include any 2000, 3000, or 4000-level courses in the Biological Sciences Department not specifically designed for non-majors. Only 1 unit of BIO 2000 or BIO 4000 allowed. Also included are any Chemistry or Math courses. See advisor for approval of courses offered by other departments.		3-4

Unrestricted Electives		
Course		Units
Select a sufficient number of courses so that the total from "Major Core", "Elective Core", "GE", and "Unrestricted Electives" is at least 120 units.		0-2
Total Units		0-2

General Education Requirements		
Area		Units
Area A Communication & Critical Thinking		9
1 Oral Communication		
2 Written Communication		
3 Critical Thinking		
Area B Scientific Inquiry and Quantitative Reasoning		12
Select at least one lab course from sub-area 1 or 2.		
1 Physical Sciences		
2 Life Sciences		
3 Laboratory Activity		
4 Quantitative Reasoning		
5 Science and Technology Synthesis		
Area C Arts and Humanities		12
1 Visual and Performing Arts		
2 Philosophy and Civilization		
3 Literature and Foreign Languages		
4 Arts and Humanities Synthesis		
Area D Social Sciences		12
1 U.S. History and American Ideals		
2 US Constitution and California Government		
3 The Social Sciences: Principles, Methodologies, Value Systems, and Ethics		
4 Social Science Synthesis		
Area E Lifelong Understanding and Self Development		3
Total Units		48
American Institutions		6
Courses that satisfy this requirement may also satisfy G.E. Area D1		
American Cultural Perspectives Requirement		3
Refer to catalog for list of courses that satisfy this requirement. Course may also satisfy major, minor, GE, or unrestricted elective requirements.		
All persons who receive undergraduate degrees from Cal Poly Pomona must pass the Graduation Writing Test (GWT). The test must be taken by the semester following completion of 90 units for undergraduates.		

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**Emphasis 1 - Integrative Biology*****Recommended elective courses:**

Select from each of the three areas (A, B, and C) listed below, with at least one course from each area.

Area A (Cellular and Molecular)

BIO 3620/3620L Applied Microbiology (2/1)
 BIO 3640/3640L Food Microbiology (2/1)
 BIO 4020/4020L Developmental Biology (2/1)
 BIO 4020 Human Genetics (2)
 BIO 4040 Advanced Genetics (2)
 BIO 4060 Regulatory Affairs and Safety Assessment (2)
 BIO 4100 Biophysics (2)
 BIO 4190/4190L Neuroscience I: Cell and Molecular (2/1)
 BIO 4200 Concepts of Molecular Biology (2)
 BIO 4200/4200L Molecular Biology Techniques (2/1)
 BIO 4360/4360L Bioinformatics (2/1)
 BIO 4400/4400L Stem Cell Biology (2/1)
 BIO 4540 Plant Genetics (2)
 BIO 4560 Plant Development and Differentiation (2)
 BIO 4650/4650L Medical Microbiology (2/1)
 BIO 4640 Medical Virology (2)
 BIO 4660/4660L Immunology (2/1)
 BIO 4680/4680L Microbial Physiology (2/1)
 BIO 4670/4670L General Virology (2/2)
 BIO 4700/4700L Hematology (2/1)
 BIO 4710 Immunohematology (2)

Area B (Physiology/Organismal)

BIO 2340/2340L Human Anatomy (2/2)
 BIO 2350/2350L Human Physiology (2/1)
 BIO 2370/2370L Introduction to Invertebrate Zoology (2/1)
 BIO 2360/2360L Introduction to Vertebrate Zoology (2/1)
 BIO 3090 Biology of the Brain (2) (SS)
 BIO 3600 General Epidemiology (2)
 BIO 4200 Neuroscience I: Systems Neuroscience (2)
 BIO 4220/4220L Neural Circuits of Behavior
 BIO 4240 Neuromuscular Physiology (2)
 BIO 4450/4450L Physiology I (2/1)
 BIO 4460/4460L Physiology II (2/1)
 BIO 4480/4480L Plant Physiology (2/1)
 BIO 4520/4520L Plant Anatomy (2/2)
 BIO 4600/4600L Entomology (2/2)
 BIO 4610/4610L Histology (2/2)
 BIO 4620/4620L Ichthyology (2/2)
 BIO 4640/4640L Hepatology (2/2)

Area C (Ecology/Environmental)

BIO 2130 Marine Biology (2)
 BIO 3250L Ecology Lab (1)
 BIO 3500/3500L California Flora (1/1)
 BIO 4000 Water Pollution Biology (2)
 BIO 4140 Biology of Species Invasions (2)
 BIO 4160/4160L Marine Ecology (2/1)
 BIO 4460/4460L Marine Botany (2/2)
 BIO 4520/4520L Evolution of Plants (2/1)
 BIO 4550/4550A/4550L Field Biology (1-6 each)
 BIO 4570/4570L Plants and the Environment (2/2)
 BIO 4580 Ecology and Conservation of Hawaiian Ecosystems (2)
 BIO 4590/4590AS Ethnobotany (1/2)
 BIO 4600/4600L Microbial Ecology (2/1)
 BIO 4620/4620L Plant-Microbe Interactions (2/1)
 BIO 4610/4610AS Interpretation of Science Service Learning (1/2)

Emphasis 2 - Botany**Recommended elective courses:**

BIO 2060/2060L Plant Form and Function (2/1)
 BIO 3250L Ecology Lab (1)
 BIO 4460/4460L Plant Physiology (2/1)
 PLT 2310/2310L - Basic Soil Science (2/1)

Additional elective courses:

BIO 2060/2060L Basic Microbiology (2/1)
 BIO 3500/3500L California Flora (1/1)
 BIO 4460/4460L Marine Botany (2/2)
 BIO 4520/4520L Evolution of Plants (2/1)
 BIO 4520/4520L Plant Anatomy (2/2)
 BIO 4540 Plant Genetics (2)
 BIO 4560 Plant Development and Differentiation (2)
 BIO 4570/4570L Plants and the Environment (2/2)
 BIO 4600/4600L Entomology (2/2)

Emphasis 3 - Neuroscience and Physiology***Recommended elective courses:**

BIO 4190/4190L Neuroscience I: Cell and Molecular (2/1)
 BIO 4200/4200L Neuroscience II: Systems Neuroscience
 BIO 4450/4450L Physiology I (2/1)
 BIO 4460/4460L Physiology II (2/1)

Additional elective courses:

BIO 4100 Biophysics (2)
 BIO 4220/4220L Neural Circuits of Behavior (2/1)
 BIO 4240 Neuromuscular Physiology (2)
 BIO 4360/4360L Protein Biotechnology (2/2)
 BIO 4360/4360L Bioinformatics (2/1)
 BIO 4400/4400L Stem Cell Biology (2/1)
 BIO 4610/4610L Histology (2/2)

Emphasis 3 - Genetics and Molecular Cell Biology***Recommended elective courses:**

BIO 2060/2060L Basic Microbiology (2/1)
 BIO 4040 Advanced Genetics (2)
 BIO 4200 Concepts of Molecular Biology (2)
 BIO 4320/4320L Molecular Biology Techniques (2/1)
 BIO 4450/4450L Physiology I (2/1)
 or BIO 4460/4460L Plant Physiology (2/1)
 or BIO 4600/4600L Microbial Physiology (2/1)
 BIO 4540 Plant Genetics (2)

Emphasis 4 - Zoology**Recommended elective courses:**

BIO 2370/2370L Introduction to Invertebrate Zoology (2/1)
 BIO 2360/2360L Introduction to Vertebrate Zoology (2/1)
 BIO 3250L Ecology Lab (1)
 BIO 4450/4450L Physiology I (2/1)
 BIO 4460/4460L Physiology II (2/1)

Additional elective courses:

BIO 3130 Marine Biology (2) (SS)
 BIO 3500/3500L California Flora (1/1)
 BIO 4020/4020L Developmental Biology (2/1)
 BIO 4100 Biophysics (2)
 BIO 4140 Biology of Species Invasions (2)
 BIO 4160/4160L Marine Ecology (2/1)
 BIO 4190/4190L Neuroscience I: Cell and Molecular (2/1)
 BIO 4460/4460L Marine Botany (2/2)
 BIO 4600/4600L Entomology (2/2)
 BIO 4610/4610L Histology (2/2)
 BIO 4620/4620L Ichthyology (2/2)
 BIO 4640/4640L Hepatology (2/2)

Emphasis 4 - Microbiology***Recommended elective courses:**

BIO 2060/2060L Basic Microbiology (2/1)
 BIO 4650/4650L Medical Microbiology (2/1) †
 BIO 4660/4660L Microbial Physiology (2/1)
 BIO 4680/4680L Microbial Ecology (2/1)

Additional elective courses:

BIO 3600 General Epidemiology (2)
 BIO 3620/3620L Applied Microbiology (2/1)
 BIO 3640/3640L Food Microbiology (2/1)
 BIO 4640 Medical Virology (2)
 BIO 4660/4660L Immunology (2/1) †
 BIO 4670/4670L General Virology (2/2)
 BIO 4680/4680L Plant-Microbe Interactions (2/1)
 BIO 4700/4700L Hematology (2/1) †
 BIO 4710 Immunohematology (2)

Note:

* Emphasis recommended for pre-professional students in medicine, dentistry, and pharmacy. In addition, one year of organic chemistry with laboratories are required. One year of biochemistry with laboratories are also required for pharmacy and highly recommended for medicine and dentistry programs. For most updated and specific professional degree and school requirements, consult individual professional schools or the Pre-Professional advisor.

† Required course for the admission to the Clinical Laboratory Scientist (CLS) programs. In addition, CHEM 2210/2210L Quantitative Analysis (2/2) is required and can be taken as a support elective.

Courses not listed may be acceptable following consultation with advisor.