



**California State Polytechnic University, Pomona  
Degree Curriculum Sheet**

Plan (Major) **BIOTECHNOLOGY**

Catalog Year **2014 - 2015**

Name \_\_\_\_\_

Subplan/Option \_\_\_\_\_

Minimum Units Required **180**

Student ID \_\_\_\_\_

Required Core Courses		
Course		Units
Foundations of Biology: Reproduction and Development & Lab	BIO 122/122L	3/2
Foundations of Biology: Biodiversity & Lab	BIO 123/123L	3/2
Biometrics & Lab	BIO 211/211L	3/1
Horizons in Biotechnology	BIO 230	1
Genetics	BIO 303	4
Cell and Molecular Biology	BIO 310	4
Internship in Biology	BIO 441	2
or Cooperative Education	SCI 470	(2)
Concepts of Molecular Biology	BIO 450	4
Molecular Biology Techniques & Lab	BIO 451/451L	3/2
Scientific Communication	BIO 490	1
General Chemistry & Lab	CHM 122/122L	3/1
General Chemistry & Lab	CHM 123/123L	3/1
Quantitative Analysis & Lab	CHM 221/221L	2/2
Organic Chemistry & Lab	CHM 314/317L	3/1
Organic Chemistry & Lab	CHM 315/318L	3/1
Organic Chemistry & Lab	CHM 316/319L	3/1
Biochemistry & Lab	CHM 327/327L	3/1
Biochemistry & Lab	CHM 328/328L	3/1
Biochemistry & Lab	CHM 329/329L	3/1
Basic Microbiology & Lab	MIC 201/201L	3/1
<b>Total Units</b>		<b>75</b>

Elective Core Courses	
Course	Units
Upper Division Course Clusters	24
At least 18 units from one "Primary" cluster and 6 units from any of the other five clusters, to be selected in consultation with faculty advisor. See "Upper Division Course Clusters" listed on the back of the Curriculum Sheet.	
<b>Total Units</b>	<b>24</b>

Required Support Courses		
Course		Units
The following required support courses should be taken to satisfy the indicated GE Requirements to achieve the minimum units to degree listed at the top of this sheet.		
Foundations of Biology: Energy and Matter Cycles and Flows & Lab (B2, B3)	BIO 121/121L	3/2
Human Sexuality (B5)	BIO 301	4
or Biology of Cancer (B5)	BIO 302	(4)
or Biology of the Brain (B5)	BIO 309	(4)
or Biodiversity Conservation (B5)	BIO 340	(4)
General Chemistry & Lab (B1, B3)	CHM 121/121L	3/1
Freshman English II (A3)	ENG 105	4
Stretch Composition III (A2)	ENG 107	4
or Advanced Stretch Composition II (A2)	ENG 109	(4)
or First-Year Composition (A2)	ENG 110	(4)
Calculus for the Life Sciences (B4)	MAT 120	4
College Physics & Lab	PHY 121/121L	3/1
College Physics & Lab	PHY 122/122L	3/1
College Physics & Lab	PHY 123/123L	3/1
Health, Nutrition and the Integrated Being (E)	FN 203	4
or General Psychology (E)	PSY 201	(4)
or Mind, Brain & Behavior: Integrated View (E)	PSY 210	(4)
or Sci and Math: Freshmen Experience I (E)	SCI 101/101A	(1/1)
and Sci and Math: Freshmen Experience II (E)	SCI 102/102A	(1/1)
<b>Total Units</b>		<b>41</b>

General Education Requirements	
Area	Units
<b>Area A Communication &amp; Critical Thinking</b>	<b>12</b>
1. Oral Communication	
2. Written Communication	
3. Critical Thinking	
<b>Area B Mathematics &amp; Natural Sciences</b>	<b>16</b>
<i>Select at least one lab course from subarea 1 or 2.</i>	
1. Physical Science	
2. Biological Science	
3. Laboratory Activity	
4. Math/Quantitative Reasoning	
5. Science & Technology Synthesis	
<b>Area C Humanities</b>	<b>16</b>
1. Visual and Performing Arts	
2. Philosophy and Civilization	
3. Literature and Foreign Language	
4. Humanities Synthesis	
<b>Area D Social Sciences</b>	<b>20</b>
1. U.S. History, Constitution, American Ideals	
a. United States History	
b. Introduction to American Government	
2. History, Economics and Political Science	
3. Sociology, Anthropology, Ethnic & Gender Studies	
4. Social Science Synthesis	
<b>Area E Lifelong Understanding &amp; Self Development</b>	<b>4</b>
<b>Total Units</b>	<b>68</b>

American Institutions	
Courses that satisfy this requirement may also satisfy GE Area D1	<b>8</b>

American Cultural Perspectives Requirement	
Refer to catalog for list of courses that satisfy this requirement. Course may also satisfy major, minor, GE, or unrestricted elective requirements.	<b>4</b>

All persons who receive undergraduate degrees from Cal Poly Pomona must pass the Graduation Writing Test (GWT). The test must be taken by the quarter following completion of 120 units for undergraduates.

## UPPER DIVISION COURSE CLUSTERS

### CLUSTER 1 - PHYSIOLOGY

Developmental Biology	BIO 320/320L	4/1
Biophysics	BIO 410/PHY 410	4
Neuroscience	BIO 424	4
Neuroanatomy	BIO 426/426L	4/1
Cellular Physiology	BIO 428/428L	4/1
Radiation Biology	BIO 431/431L	3/1
Stem Cell Biology	BIO 465	3
Stem Cell Biology Lab	BIO 465L	1
Endocrinology	BIO 520/520L	3/1
Plant Physiology	BOT 428/428L	4/1
Plant Anatomy	BOT 435/435L	2/2
Fundamentals of Physical Chemistry	CHM 301/301A	3/1
Biomedical Instrumentation and Measurements	ECE 435L	3
Histology	ZOO 422/422L	2/3
Animal Physiology	ZOO 428/428L	4/1

### CLUSTER 2 - MOLECULAR BIOLOGY AND GENETICS

Biotechnology Applications in Animal Science	AVS 430/430L	3/1
Developmental Biology	BIO 320/320L	4/1
Human Genetics	BIO 403/403L	3/1
Biophysics	BIO 410/PHY 410	4
Advanced Genetics	BIO 421	4
Population Genetics & Lab	BIO 445/445L	3/1
Molecular Biology of Recombinant DNA	BIO 455/455L	2/2
Bioinformatics	BIO 459/459L	3/2
Computer-assisted Drug Design	BIO 463/463L	3/1
Stem Cell Biology	BIO 465	3
Stem Cell Biology Lab	BIO 465L	1
Advanced Cell Biology**	BIO 535	4
Molecular Biology of Development**	BIO 555	4
Advanced Bacterial Physiology and Genetics**	BIO 560	4
Animal Tissue Culture**	BIO 565/565L	2/2
Transmission Electron Microscope Techniques**	BIO 577/577L	2/3
Scanning Electron Microscope Techniques**	BIO 578/578L	2/3
Plant Tissue Culture	BOT 456/456L	3/1
Recombinant DNA Biochemistry	CHM 453	3
Microbial Physiology and Lab	MIC 428/428L	4/1
Plant Breeding	PLT 404/404L	3/1

### CLUSTER 3 - MICROBIOLOGY AND PATHOLOGY

Developmental Biology	BIO 320/320L	4/1
Radiation Biology	BIO 431/431L	3/1
Advanced Bacterial Physiology and Genetics**	BIO 560	4
Cellular Immunity & Disease**	BIO 570/570L	3/1
Applied Microbiology	MIC 310/310L	3/2
Food Microbiology	MIC 320/320L	3/1
General Epidemiology	MIC 330	4
Medical Bacteriology	MIC 410/410L	3/2
Immunology-Serology	MIC 415/415L	3/2
Medical Mycology	MIC 425/425L	3/2
Microbial Physiology	MIC 428/428L	4/1
General Virology	MIC 430/430L	3/2
Hematology	MIC 444	3
Hematology Lab	MIC 444L	1
Immunohematology	MIC 445	3
Immunohematology Lab	MIC 445L	1
Histology	ZOO 422/422L	2/3
Medical Parasitology	ZOO 425/425L	3/2

### CLUSTER 4 - BIOCHEMISTRY AND MOLECULAR SEPARATION TECHNIQUES

Elements of Physical Chemistry	CHM 304/304A	3/1
Elements of Physical Chemistry	CHM 305	3
The Chemist in Industry	CHM 340	4
Spectroscopic Methods	CHM 342/342L	2/2
Separation Methods	CHM 343/343L	2/2
Electroanalytical Methods	CHM 344/344L	2/2
Physical Chemistry	CHM 352/352L	1/2
Macromolecular Modeling	CHM 416	4
Computational Chemistry	CHM 417	4
Organic Synthesis	CHM 422/422L	2/2
Organic Analysis	CHM 424/424L	2/2
Bioanalytical Chemistry	CHM 450	4
Enzymology	CHM 451/451L	3/1
Recombinant DNA Biochemistry	CHM 453	3
Biochemical Mechanisms** and Biomedical Instrumentation & Measurements	CHM 565 ECE 435/435L	3 3/1

### CLUSTER 5 - AGRICULTURE

Animal Parasitology	AHS 302/302L	3/1
Immunological Procedures in Animal Production	AVS 405/405L	3/1
Mammalian Endocrinology	AVS 412	4
Biotechnology Applications in Animal Science	AVS 430/430L	3/1
Advanced Animal Breeding	AVS 432/432L	3/1
Plant Physiology	BOT 428/428L	4/1
Plant Anatomy	BOT 435/435L	2/2
Plant Tissue Culture	BOT 456/456L	3/1
Food and Agricultural Marketing Applications	ABM 405	4
Agriculture, Nutrition, and International Development	FN 445/IA 445	4/4
Food Safety and Current Issues	FST 325	4
Food Chemistry	FST 420/420L	3/1
Principles of HACCP	FST 430/430A	3/1
Food Chemistry II	FST 426/426L	3/1
Food Microbiology	MIC 320/320L	3/1
Plant Breeding	PLT 404/404L	3/1
Crop Diseases	PLT 421/421L	3/1
Advanced Plant Propagation	PLT 422/422L	3/1
Diseases of Ornamental	PLT 427/427L	3/1
Soil Chemistry	PLT 431/431L	3/1
Environmental Sustainable Agriculture	PLT 437/437L	3/1

### CLUSTER 6 - BUSINESS

Regulatory Affairs and Safety Assessment	BIO 405	4
Management Information Systems	CIS 310	4
Principles of Marketing Management	IBM 301	4
Marketing Strategy	IBM 302	4
Organizational Behavior	MHR 318	4
Training and Development	MHR 405	4
Advanced Organizational Behavior	MHR 438	4
Operations Management	TOM 301	4

Up to 4 units of BIO 441 and/or BIO 461 and 2 units of BIO 462 may count towards core electives.  
 \*\* 500-level courses. Conditions which must be met to use these for undergraduate units are: a total of no more than 13 units may be used for undergraduate credit, the student must have senior standing and at least a 2.75 upper-division GPA. A special petition must be filed to receive undergraduate credit for graduate courses.