Plan (Major) __**BIOTECHNOLOGY**__

Subplan/Option _____

Catalog Year _____**2010–2011**_____

Minimum Units Required ____**184**____

Name_____

Student ID _____

Evaluator _____

GWT Satisfied _____Yes ____No

Required Core Courses

Course		Units
Foundations of Biology	BIO 122/122L	3/2
Foundations of Biology	BIO 123/123L	3/2
Biometrics	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	BIO 451/451L	3/2
Scientific Communication	BIO 490	1
General Chemistry	CHM 122/122L	3/1
General Chemistry	CHM 123/123L	3/1
Quantitative Analysis	CHM 221/221L	2/2
Organic Chemistry	CHM 314/317L	3/1
Organic Chemistry	CHM 315/318L	3/1
Organic Chemistry	CHM 316/319L	3/1
Biochemistry	CHM 327/327L	3/1
Biochemistry	CHM 328/328L	3/1
Biochemistry	CHM 329/329L	3/1
Basic Microbiology	MIC 201/201L	3/2
Total Units		**76**

Elective Core Courses

Course	Units
Upper Division Course Clusters	27
At least 20 units from one "Primary" cluster and 7 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.	
Total Units	**27**

Required Support Courses

Course		Units
Foundations of Biology/Lab (B2, B3)	BIO 121/121L	3/2
General Chemistry/Lab (B1, B3)	CHM 121/121L	3/1
College Physics	PHY 121/121L	3/1
College Physics	PHY 122/122L	3/1
College Physics	PHY 123/123L	3/1
Freshman English I (A2)	ENG 104	4
Freshman English II (A3)	ENG 105	4
Calculus for Life Sciences (B4)	MAT 120	4
Health, Nutrition and the Integrated Being (E)	FN 203	4
or General Psychology (E)	PSY 201	(4)
or Mind, Brain & Behavior: Intgrtd View (E)	PSY 210	(4)
or Sci. and Mathematics: Freshmen Exp. I (E)	SCI 101/101A	(1/1)
-and-		
Sci. and Mathematics: Freshmen Exp. II (E)	SCI 102/102A	(1/1)
Total Units		**37**

General Education Requirements

Area	Units
Area A Communication & Critical Thinking	**12**
1 Oral Communication	
2 Written Communication	
3 Critical Thinking	
Area B Mathematics & Natural Sciences	**16**
Select at least one lab course from sub-area 1 or 2.	
1 Physical Science	
2 Biological Science	
3 Laboratory Activity	
4 Math/Quantitative Reasoning	
5 Science & Technology Synthesis	
Area C Humanities	**16**
1 Visual and Performing Arts	
2 Philosophy and Civilization	
3 Literature and Foreign Language	
4 Humanities Synthesis	
Area D Social Sciences	**20**
1 U.S. History, Constitution, American Ideals	
2 History, Economics and Political Science	
3 Sociology, Anthropology, Ethnic & Gender Studies	
4 Social Science Synthesis	
Area E Lifelong Understanding & Self Development	**4**
Total Units	**68**

American Institutions	
Courses that satisfy this requirement may also satisfy G.E. Area D1	8

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

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.

Course		GE Area
Freshman English I	ENG 104	A2
Freshman English II	ENG 105	A3
General Chemistry	CHM 121/121L	B1, B3
Foundations of Biology	BIO 121/121L	B2, B3
Calculus for Life Sciences	MAT 120	B4
Health, Nutrition and the Integrated Being	FN 203	E
or General Psychology	PSY 201	(E)
or Mind, Brain & Behavior: Intgrtd View	PSY 210	(E)
or Sci. and Mathematics: Freshmen Exp. 1 and Exp. 2	SCI 101/101A & SCI 102/102A	(E)

The remaining GE requirements may be satisfied by any course approved for that area.

No more than 105 community college quarter units or 36 extension credit quarter units may be applied toward a Bachelor's degree.

A minimum 2.0 cumulative GPA is required in core (including option) courses, Cal Poly Pomona courses, and overall work completed in order to receive a degree in this major.

UPPER DIVISION COURSE CLUSTERS*

Cluster 1 - Physiology

Developmental Biology/Lab	BIO 320/320L	3/2
Biophysics	BIO/PHY 410	4
Neuroscience	BIO 424	4
Neuroanatomy/Lab	BIO 426/426L	4/1
Cellular Physiology/Lab	BIO 428/428L	3/2
Radiation Biology/Lab	BIO 431/431L	3/1
Stem Cell Biology	BIO 465	3
Endocrinology**/Lab	BIO 520/520L	3/1
Plant Physiology/Lab	BOT 428/428L	3/2
Plant Anatomy/Lab	BOT 435/435L	2/2
Fundamentals of Physical Chemistry	CHM 301/301A	3/1
Biomedical Instrumentation/Lab	ECE 435/485L	3/1
Histology/Lab	ZOO 422/422L	2/3
Animal Physiology/Lab	ZOO 428/428L	3/2

Cluster 2 - Molecular Biology & Genetics

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

Cluster 3 - Microbiology & Pathology

Developmental Biology/Lab	BIO 320/320L	3/2
Radiation Biology/Lab	BIO 431/431L	3/1
Advanced Bacterial Physiology**	BIO 560	4
Immunity & Disease**/Lab	BIO 570/570L	3/1
Applied Microbiology/Lab	MIC 310/310L	3/2
Food Microbiology/Lab	MIC 320/320L	3/1
General Epidemiology	MIC 330	4
Medical Bacteriology/Lab	MIC 410/410L	3/2
Immunology-Serology/Lab	MIC 415/415L	3/2
Medical Mycology/Lab	MIC 425/425L	3/2
Microbial Physiology/Lab	MIC 428/428L	3/2
General Virology/Lab	MIC 430/430L	3/2
Hematology /Lab	MIC 444/444L	3/1
Immunohematology/Lab	MIC 445/445L	3/1
Histology/Lab	ZOO 422/422L	2/3
Medical Parasitology/Lab	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/Lab	CHM 342/342L	2/2
Separation Methods/Lab	CHM 343/343L	2/2
Electroanalytical Methods/Lab	CHM 344/344L	2/2
Physical Chemistry/Lab	CHM 352/352L	1/2
Macromolecular Modeling	CHM 416	4
Computational Chemistry	CHM 417	4
Organic Synthesis/Lab	CHM 422/422L	2/2
Organic Analysis/Lab	CHM 424/424L	2/2
Bioanalytical Chemistry	CHM 450	4
Enzymology/Lab	CHM 451/451L	3/1
Recombinant DNA Biochemistry	CHM 453	3
Biochemical Mechanisms**	CHM 565	3
Biomedical Instrumentation/Lab	ECE 435/485L	3/1

Cluster 5 - Agriculture

Animal Parasitology/Lab	AHS 302/302L	3/1
Immunlogical Proc in Animal Production/Lab	AVS 405/405L	3/1
Mammalian Endocrinology	AVS 412	4
Biotechnology Applications/Lab	AVS 430/430L	4/1
Advanced Animal Breeding/Lab	AVS 432/432L	3/1
Plant Genetics	BOT 403/403L	3/1
Plant Physiology	BOT 428/428L	3/2
Plant Anatomy	BOT 435/435L	2/2
Plant Tissue Culture	BOT 456/456L	2/2
Food and Agricultural Marketing	FMA 405	4
Agriculture, Nutrition, & Int. Dev.	FN/IA 445	4
Food Safety & Current Issues	FST 325	4
Food Chemistry/Lab	FST 420/420L	3/1
Food Analysis/Lab	FST 422/422L	3/1
Principles of HACCP/Lab	FST 423/423L	3/1
Food Chemistry II	FST 426/426L	3/1
Food Microbiology/Lab	MIC 320/320L	3/1
Plat Breeding/Lab	PLT 404/404L	3/1
Crop Diseases/Lab	PLT 421/421L	3/1
Advanced Plant Propagation/Lab	PLT 422/422L	3/1
Diseases of Ornamental Plants/Lab	PLT 427/427L	3/1
Soil Chemistry/Lab	PLT 431/431L	3/1
Environmental Sustainable Ag/Lab	PLT 437/437L	3/1

Cluster 6 - Business

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

** 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 G.P.A. A special petition must be filed to receive undergraduate credit for graduate courses.

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