

The Pennsylvania State University  
Department of Biochemistry & Molecular Biology  
BIOTECHNOLOGY MAJOR – General Option  
Course Requirements (For students entering Fall 2012 and later)

1. GENERAL EDUCATION			
<b>ARTS (6 cr)</b>			
	(GA)	3	
	(GA)	3	
	(GA)	3	
<b>HUMANITIES (6 cr)</b>			
	(GH)	3	
	(GH)	3	
	(GH)	3	
<b>SOCIAL &amp; BEHAVIORAL SCIENCES (6 cr)</b>			
	(GS)	3	
	(GS)	3	
	(GS)	3	
Students may <b>petition</b> to substitute 3 credits from one of the above knowledge domains for 3 credits in another domain, thereby substituting 9-6-3 credit pattern for the default 6-6-6 pattern in these general education courses.			
<b>COMMUNICATIONS (GWS) (9 cr)</b>			
^ ENGL 015 or 030; Rhetoric & Comp		3	
^ CAS 100 A, B, or C: Effective Speech		3	
^ ENGL/CAS 137H (fall) and 138T (spring) - Honor students first-year experience in place of ENGL30/CAS100.			
ENGL 202C: Technical Writing		3	
<b>HEALTH &amp; PHYSICAL ACTIVITIES (3 cr)</b>			
(GHA or GHS or GPE)			
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<b>WRITING ACROSS THE CURRICULUM (3 cr)</b>			
		3	
<b>US/INTERNATIONAL CULTURES (6 cr)</b>			
(US)			
(IL)			
2. REQUIREMENTS FOR THE MAJOR			
<b>CHEMISTRY (8 cr)</b>			
CHEM 110 (H): Chemical Principles I - <b>"C" required</b>		3	
CHEM 111: Experimental Chemistry I - <b>"C" required</b>		1	
CHEM 112 (H): Chemical Principles II - <b>"C" required</b>		3	
CHEM 113: Experimental Chemistry II		1	
<b>BIOCHEMISTRY &amp; MOLECULAR BIOLOGY (14 cr)</b>			
BMB 211: Elementary Biochem		3	
BMB 221: Applied Biochemistry		2	
BMB 251: Molecular & Cell Biology		3	
BMB 252: Molecular & Cell Biology II		3	
BMB 442: Lab Prot., Nuc. Acid, Molec Clon		3	
<b>BIOTECHNOLOGY (11 cr)</b>			
BIOTC 416: Microbial Biotechnology		2	
BIOTC 459: Plant Tissue Culture Biotc.		3	
BIOTC 479: Methods Biofermentations		3	
BIOTC 489: Animal Cell Culture Meth.		3	
<b>MICROBIOLOGY (11 cr)</b>			
MICRB 201: Intro. Microbiology		3	
MICRB 202: Intro. Microbiology Lab		2	
MICRB 410: Principals of Immunology		3	
MICRB 421W: Lab Gen/Applied Micro		3	
<b>MATHEMATICS ( 8 cr)</b>			
MATH 140: Calculus I - <b>"C" required</b>		4	
MATH 141: Calculus II		4	
<b>STATISTICS (3 cr)</b>			
STAT 250: Introduction Biostatistics			
<b>BIOLOGY (3 cr)</b>			
BIOL 322: Genetic Analysis		3	
<b>PHYSICS (8 cr)</b>			
PHYS 250: Intro Physics I		4	
PHYS 251: Intro Physics II		4	

FIRST YEAR SEMINAR (1 cr)			
PSU 016: First Year Seminar		1	
3. ELECTIVES IN THE MAJOR			
<b>a. Select 6 or 8 credits from chemistry sequence:</b>			
CHEM 210 (H): Organic Chemistry I		3	
CHEM 212 (H): Organic Chemistry II		3	
CHEM 213: Organic Chemistry Lab		2	
<b>or</b>			
CHEM 202: Fund. of Organic Chem I		3	
CHEM 203: Fund. of Organic Chem II		3	
<b>+</b>			
<b>b. Select 6 credits from any 400-level BIOTC/BMB/MICRB lecture course, or FD SC 408</b>			
4. LIST C FREE ELECTIVES			
Select 14-16 credits from department list			
<b>Total</b>			
<b>LIST C FREE ELECTIVES</b> - With the EXCEPTION of the courses listed below, ALL courses appearing in the University Bulletin are acceptable as elective courses: 6 credits of ROTC may be applied toward graduation requirements. <b>Students MAY NOT</b> fulfill this requirement with lower level or general education courses in math and science (including but not limited to examples such as: any BI SC course, any B M B course below the 100 level, MATH 110 and 111, and the like). <b>Students MAY NOT</b> fulfill this requirement with courses that significantly repeat material from courses required for the major, (including but not limited to examples such as: CHEM 202 or 203 after taking CHEM 210 or 212, or vice-versa; PHYS 250 or 251 after taking PHYS 211, 212, 213, and 214, or vice-versa; and so forth). <b>Students MAY NOT</b> fulfill this requirement with remedial courses (including but not limited to examples such as: LL ED 005 and 010; ENGL 004, 005, and 006; CHEM courses below CHEM 110; MATH courses below MATH 110; STAT 100; PHYS courses below PHYS 211; and the like).			
5. TO GRADUATE			
A <b>"C"</b> grade or better is required in <b>2</b> of the following <b>3</b> courses. <b>All 3 courses required.</b>			
MICRB 201: Intro. Microbiology		3	
MICRB 251: Molecular & Cell Biology		3	
MICRB 252: Molecular & Cell Biology		3	
<b>Total ≥</b>		<b>9</b>	
<b>+</b>			
Earn <b>"C"</b> or higher in 9 credits of any 400-level MICRB/BMB/BIOTC courses except BMB 442, 443W, 445W, 448, 488, 496, MICRB 421W, 422, 447			
<b>Total ≥ 9</b>			
6. ENTRANCE TO MAJOR			
2.0 GPA is required			
CHEM 110 (H): Chemical Principals		3	
CHEM 111: Experimental Chemistry I		1	
CHEM 112 (H): Chemical Principals II		3	
MATH 140: Calculus I		4	
A student enrolled in this major must receive a grade <b>"C"</b> or better in the following courses specified by Senate Policy 82-44			
7. REMEDIAL & REPEATS			
Courses that do not meet degree requirements			
8. SENATE POLICY 83-80			
Source/Time Credit acquisition:			
36 of last 60 credits at PSU?			
60 credits in last 5 years?			
9. GPA/CREDITS			
Overall GPA must be ≥ 2.0			
Total credits earned (less repeats and remedial; <b>must have at least 125 credits to graduate</b> ).			