

The Pennsylvania State University
 Department of Biochemistry & Molecular Biology
BIOCHEMISTRY & MOLECULAR BIOLOGY – Molecular & Cell Biology Option
 Course Requirements (Effective Fall 2016 or later)



1. 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 "C" or better in the courses listed above specified by Senate Policy 82-44			
2. HIGH SCHOOL LANGUAGE ADMISSION REQUIREMENT: Y OR N			
3. FIRST-YEAR SEMINAR (1 Unit)			
PSU 016: First Year Seminar	1		
WRITING ACROSS THE CURRICULUM (3 Units)			
UNITED STATES AND INTERNATIONAL CULTURES (6 Units)			
(US)			
(IL)			
4. MINIMUM CUMULATIVE GPA REQUIREMENT FOR GRADUATION			
Overall GPA must be ≥ 2.0			
Total units earned (less repeats and remedial; must have at least 125 units to graduate).			
5. RESIDENCY REQUIREMENTS: SENATE POLICY 83-80			
At least 36 of last 60 units must be earned at PSU?			
60 units in last 5 years?			
6. GENERAL EDUCATION			
WRITING/SPEAKING (GWS) (9 Units)			
^ 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		
ARTS (6 Units)			
(GA)	3		
(GA)	3		
(GA)	3		
HUMANITIES (6 Units)			
(GH)	3		
(GH)	3		
(GH)	3		
SOCIAL & BEHAVIORAL SCIENCES (6 Units)			
(GS)	3		
(GS)	3		
(GS)	3		
Students may petition to substitute 3 units from one of the above knowledge domains for 3 units in another domain, thereby substituting 9-6-3 unit pattern for the default 6-6-6 pattern in these general education courses.			
HEALTH AND PHYSICAL ACTIVITY (3 Units)			
(GHA)			
(GHA)			
(GHA)			
7. REQUIREMENTS FOR THE MAJOR			
CHEMISTRY (16 Units)			
CHEM 110 (H): Chemical Principles I - "C" required	3		
CHEM 111: Experimental Chemistry I - "C" required	1		
CHEM 112 (H): Chemical Principles II - "C" required	3		
CHEM 113: Experimental Chemistry II	1		
CHEM 210 (H): Organic Chemistry I	3		
CHEM 212 (H): Organic Chemistry II	3		
CHEM 213: Laboratory in Organic Chemistry	2		
PHYSICAL CHEMISTRY (3 Units)			
BMB 428: Physical Chem. w/Biological Applications	3		
BIOCHEMISTRY & MOLECULAR BIOLOGY (28 Units)			
BMB 251: Molecular and Cell Biology	3		
BMB 252: Molecular and Cell Biology II	3		
BMB 400: Molecular Biology of the Gene	2		
BMB 401: General Biochemistry	3		
BMB 402: General Biochemistry	3		

BMB 430: Developmental Biology	3		
BMB 442: Lab Prot., Nuc. Acids, & Molec. Cloning	3		
BMB 443W: Lab Protein Purifi./Enzymology	3		
BMB 445W: Lab in Molecular Genetics I	2		
or			
BMB 448: Model Sys. & Approaches in Cell Biol. Inq.	2		
BMB 460: Cell Growth and Differentiation	3		
MICROBIOLOGY (8 Units)			
MICRB 201: Introductory Microbiology	3		
MICRB 202: Introductory Microbiology Lab	2		
MICRB 410: Principles of Immunology	3		
MATHEMATICS (8 Units)			
MATH 140: Calculus I - "C" required	4		
MATH 141: Calculus II	4		
BIOLOGY (3 Units)			
BIOL 322: Genetic Analysis	3		
PHYSICS (8 Units)			
PHYS 250: Introductory Physics I	4		
PHYS 251: Introductory Physics II	4		
A "C" grade or better is required in <u>2</u> of the following <u>3</u> courses. All 3 courses required			
MICRB 201: Introductory Microbiology	3		
BMB 251: Molecular and Cell Biology I	3		
BMB 252: Molecular and Cell Biology II	3		
Total \geq		9	
Earn "C" or higher in 9 units of any 400-level MICRB/BMB courses except BMB 442, 443W, 445W, 448, 488, 496, MICRB 421W, 422, and 447.			
Total ≥ 9			
8. ELECTIVES IN THE MAJOR			
Select 5-6 units from any 400 level BMB/MICRB course with a total maximum of 4-units in BMB 488 and/or 496:			
Total			
9. MATHEMATICAL SCIENCE (DEPARTMENT LIST B)			
LIST B select 2-4 units from: CMPSC 101 (3), 102 (3), 121 (3), 200 (3), 201 (3); MATH 220 (2), 230 (4), 231 (2), 250 (3), 251 (4); STAT 200 (4), 240 (3), 250 (3), 301 (3), 401 (3)			
Total			
9. LIST C FREE ELECTIVES			
Select 4 – 13 units from department list			
Total			
LIST C FREE ELECTIVES - With the EXCEPTION of the courses listed below, ALL courses appearing in the University Bulletin are acceptable as elective courses: 6 units of ROTC may be applied toward graduation requirements. Students MAY NOT 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). Students MAY NOT 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). Students MAY NOT 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).			