The Pennsylvania State University
Department of Biochemistry & Molecular Biology
BIOTECHNOLOGY MAJOR – Clinical Laboratory Science 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		
(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 (14 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 202: Fundamentals of Organic Chemistry I	3		
CHEM 203: Fundamentals of Organic Chemistry II	3		
BIOCHEMISTRY & MOLECULAR BIOLOGY (6 Units)			
BMB 211: Elementary Biochemistry	3		
BMB 212: Elementary Biochemistry Laboratory	1		
BMB 221: Applied Biochemistry	2		
MICROBIOLOGY (52 Units)			
MICRB 201: Introductory Microbiology	3		
MICRB 202: Introductory Microbiology Lab	2		
MICRB 251: Molecular and Cell Biology I	3		
MICRB 252: Molecular and Cell Biology II	3		
MICRB 410: Principles of Immunology	3		
MICRB 412: Medical Microbiology	3		
MICRB 421W: Lab General & Applied Microbiology	3		
MICRB 422: Medical Microbiology Laboratory	2		
MICRB 405A: Seminar/Practicum in Medical Tech.	8		
MICRB 405B: Seminar/Practicum in Medical Tech.	1		
MICRB 405C: Seminar/Practicum in Medical Tech.	6		
MICRB 405D: Seminar/Practicum in Medical Tech.	5		
MICRB 405E: Seminar/Practicum in Medical Tech.	7		
MICRB 405F: Seminar/Practicum in Medical Tech.	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 **2** of the following **3** courses. **All 3 courses required**			
MICRB 201: Introductory Microbiology	3		
MICRB 251: Molecular and Cell Biology I	3		
MICRB 252: Molecular and Cell Biology II	3		
Total ≥	**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			
9. LIST C FREE ELECTIVES			
Select **1 - 3** 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).