BIOCHEMISTRY, BA

Contemporary biological sciences are based on the principles of chemistry and physics. The importance of this relationship is the basis of the Penn Biochemistry major, which prepares students for advanced study in areas as diverse as biochemistry, biophysics, biotechnology, cell biology, chemical biology, genetic engineering, genomics, molecular biology, molecular genetics, nanotechnology, neurobiology, structural biology, and systems biology. The major provides the basic science background for graduate programs, health professional schools, careers in biotechnology, and prospective science teachers.

The minimum total course units (https://www.college.upenn.edu/credits-needed-major/) for graduation in this major is 36. Double majors may need more course units.

For more information: https://biochemistry.sas.upenn.edu

For information about the General Education requirements, please visit the College of Arts & Sciences Curriculum (https://www.college.upenn.edu/curriculum/) page.

Code	Title	Course Units
College General Education Requirements and Free Electives		
Foundational Approaches + Sectors + Free Electives		18
Mathematics Requirement [1]		
MATH 1400	Calculus, Part I	1
or MATH 1610	Calculus for the Mathematical Sciences	
or MATH 2200	Linear Algebra	
MATH 1410	Calculus, Part II	1
or MATH 2300	Introduction to Ordinary and Partial Differential Equations	
or MATH 3000	Introduction to Proofs and Linear Algebra	
Chemistry Requirement		
General Chemistry: [2]		
CHEM 1012	General Chemistry I	1
or CHEM 1151	Honors Chemistry I	
or CHEM 1011	Introduction to General Chemistry I	
CHEM 1022	General Chemistry II	1
or CHEM 1161	Honors Chemistry II	
or CHEM 1021	Introduction to General Chemistry II	
General Chemistry Laboratories:		
CHEM 1101 & CHEM 1102	General Chemistry Laboratory I and General Chemistry Laboratory II	1
Organic Chemistry Requirement		
CHEM 2411	Principles of Organic Chemistry I with Laboratory	1.5
CHEM 2421	Principles of Organic Chemistry II with Laboratory	1.5
Physical Chemistry Requirements [3]		
CHEM 2210	Physical Chemistry I (Fall Only)	1
CHEM 2220	Physical Chemistry II (Spring Only)	1
Biological Chemistry Requirements		
CHEM 2510	Principles of Biological Chemistry [4]	1
CHEM 5510	Biological Chemistry I (Fall Only)	1
CHEM 5520	Biological Chemistry II (Spring Only)	1
Physics Requirement [5]		
PHYS 0150	Principles of Physics I: Mechanics and Wave Motion	1.5
or PHYS 0170	Honors Physics I: Mechanics and Wave Motion	
PHYS 0151	Principles of Physics II: Electromagnetism and Radiation	1.5
or PHYS 0171	Honors Physics II: Electromagnetism and Radiation	
Research Requirement		
BCHE 4597	Biochemistry Laboratory [6]	2
Total Course Units		**36**

1. Biochemistry majors complete 2 CU of MATH course work at Penn, regardless of prior AP credit. Students should begin the mathematics sequence with the appropriate course based upon prior experience, math diagnostic exam, math placement exam, and/or consultation with academic/major advisors.
2. CHEM 1011 and CHEM 1021 are not recommended for Biochemistry majors and will only be considered in special circumstances. Students should consult with a Biochemistry program chair prior to taking these courses if planning on the major.
3. Biochemistry majors complete the Physical Chemistry sequence, CHEM 2210 & CHEM 2220, in year 2 or 3.
4. Majors complete CHEM 2510 Principles of Biological Chemistry before end of fourth semester (spring of year 2). Majors take CHEM 2510 Principles of Biological Chemistry after CHEM 2411 Principles of Organic Chemistry I with Laboratory but BEFORE CHEM 5510 Biological Chemistry I.
5. PHYS 0150 and PHYS 0151 are prerequisites for the physical chemistry sequence CHEM 2210 & CHEM 2220. Majors must complete 2 PHYS courses at Penn, regardless of prior AP credit for PHYS 0150 and/or PHYS 0151.
6. In Year 4, fall and spring terms, majors participate in mentored research with a host principal investigator. In Fall of Year 3, majors inform Biochemistry advisors of the status of their placement in a host group. At the start of the Spring term of Year 3, majors must inform Biochemistry program of the host investigator and group. Majors participate in host group activities in Spring of Year 3.

Honors

Requirements:

(a) 2 CU of BCHE 4597 Biochemistry Laboratory with a grade B or above.

(b) GPA of 3.2 in courses required for the major, taken at Penn (not including BCHE 4597).

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2026 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.

Sample Plan of Study

Course	Title	Course Units
First Year		
Fall		
Fall Courses		4.5
	Course Units	**4.50**
Spring		
Spring Courses		4.5
	Course Units	**4.50**
Second Year		
Fall		
Fall Courses		4.5
	Course Units	**4.50**
Spring		
Spring Courses		4.5
	Course Units	**4.50**
Third Year		
Fall		
Fall Courses		4.5
	Course Units	**4.50**
Spring		
Spring Courses		4.5
	Course Units	**4.50**
Fourth Year		
Fall		
Fall Courses		4.5
	Course Units	**4.50**
Spring		
Spring Courses		4.5
	Course Units	**4.50**
	Total Course Units	**36.00**