

BIOLOGY: MOLECULAR & CELL BIOLOGY, BA

The concentration in Molecular and Cell Biology explores how the techniques of molecular biology and genetics are used to understand cell function. As with the previous Molecular Biology Concentration (<https://www.bio.upenn.edu/undergraduate/concentrations/molecular-biology>), this concentration allows Biology majors to focus on a molecular approach to biological problems by combining lecture and seminar coursework with training in laboratory research. The list of course electives is organized into two categories: **Molecular and Cell Biology** and **Genetics and Genomics**. Advanced Experimental Research is required for the concentration.

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

With permission of the Undergraduate Chair, two course units away or LPS courses may count toward the Biology major. This limit does not apply to Study Abroad.

For more information: <http://www.bio.upenn.edu/undergraduate/concentrations/molecular-and-cell-biology>

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 ¹ + Free Electives		18.5
Major Requirements		
<i>Introductory Biology</i>		
Select one of the following tracks:		1.5-3
Track 1:		
BIOL 121	Introduction to Biology - The Molecular Biology of Life	
BIOL 123	Introductory Molecular Biology Laboratory	
Track 2:		
BIOL 101	Introduction to Biology A	
BIOL 102	Introduction to Biology B	
<i>Chemistry Requirement</i>		
Select 4 course units of Chemistry		4
<i>Calculus/Statistics Requirement</i>		
Select 2 units of Calculus/Statistics		2
<i>Intermediate Biology</i>		
BIOL 204	Biochemistry	1
	or CHEM 251 Principles of Biological Chemistry	
BIOL 205	Cell Biology	1
BIOL 221	Molecular Biology and Genetics	1
<i>Intermediate and Advanced Biology Electives</i> ²		4-5
Select 2 course units of Molecular/Cell electives		
Select 2 course units of Genetics/Genomics electives		
Select 1 course unit of an additional elective		

<i>Research Requirement</i>		2
BIOL 399	Independent Study	
BIOL 499	Advanced Independent Study	
BIOL 376	Microbial Diversity and Pathogenesis Lab	
BIOL 425	Biochemistry and Molecular Genetics Superlab	
Symposium on Undergraduate Research in Biology (SURB)		
Total Course Units		36

¹ You may count no more than one course toward both a Major and a Sector requirement. For Exceptions, check the Policy Statement (<http://www.college.upenn.edu/sectors-policy>).

² Students in Track 2 need only 4 electives.

Honors

Applicants must have a minimum GPA of 3.25 in the major and have taken BIOL 399 Independent Study. Thesis must be approved by the departmental honors committee.

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2018 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.