

CHEMISTRY, BA

The different disciplines of modern physical and biological sciences have much to offer each other through advances in technology. Aside from basic research, society continually generates fundamental scientific and technological challenges such as the need for new sources of energy, new synthetic and biotechnologies; new materials exhibiting unusual catalytic, metallic, or electrolytic properties; and developments in laser, computer, and communications technology. We consider these within the province of a unified field of molecular sciences, in which chemistry plays the central role.

Chemistry is concerned with the study of matter and the changes matter can undergo. The chemistry program provides a basic foundation for career opportunities in chemical research and teaching, in scientific communication and information transfer, and in the health professions. Students who want to prepare for advanced study in chemistry or allied fields where research experience is advantageous should complete the chemistry honors program.

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.

Those considering the Chemistry major should consult with the undergraduate chairman as soon as possible, preferably in the freshman year, especially if you have AP credit in Science and Mathematics from high school.

For more information: <http://www.chem.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 ¹ + Free Electives		19
Major Requirements		
<i>Introductory Sequences</i> ²		
General Chemistry:		
CHEM 101 or CHEM 115	General Chemistry I Honors Chemistry I	1
CHEM 102 or CHEM 116	General Chemistry II Honors Chemistry II	1
General Chemistry Laboratories:		
CHEM 053 & CHEM 054	General Chemistry Laboratory I and General Chemistry Laboratory II	1
Organic Chemistry and Laboratories:		
CHEM 241	Principles of Organic Chemistry	1
CHEM 242 or CHEM 243	Principles of Organic Chemistry II Organic Chemistry II: Principles of Org Chem with applications in Chem Biology	1
Select one of the following lab sequences:		1
CHEM 245	Experimental Organic Chemistry	
OR		

CHEM 244 & CHEM 249	Experimental Organic Chemistry Lab I and Experimental Organic Chemistry Laboratory II	
Calculus:		
MATH 104	Calculus, Part I	1
MATH 114 or MATH 116	Calculus, Part II Honors Calculus	1
Physics:		
PHYS 150	Principles of Physics I: Mechanics and Wave Motion	1.5
PHYS 151	Principles of Physics II: Electromagnetism and Radiation	1.5
<i>Additional Chemistry Requirements</i>		
Physical Chemistry and Laboratories:		
CHEM 221	Physical Chemistry I ³	1
CHEM 222	Physical Chemistry II ⁴	1
CHEM 223	Experimental Physical Chemistry I ⁴	1
Biological Chemistry:		
CHEM 251	Principles of Biological Chemistry ⁵	1
Inorganic Chemistry:		
CHEM 261	Inorganic Chemistry I ³	1
One Advanced Laboratory:		
CHEM 246	Advanced Synthesis and Spectroscopy Laboratory ⁶	1
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 Majors should complete by the end of the sophomore year.

³ Offered Fall only.

⁴ Offered Spring only.

⁵ Must be taken after CHEM 241 Principles of Organic Chemistry.

⁶ Offered Fall only and must be taken concurrently with or **after** CHEM 261 Inorganic Chemistry I.

Honors

Applicants must have a minimum GPA of 3.0 in all Math and Science courses.

Code	Title	Course Units
One advanced course (400 level or above)		1
CHEM 399	Independent Research	1
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The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2021 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.