

Science Courses Required for BA and BS Degrees in Biochemistry and Molecular Biology

The following science coursework is required for a bachelor's degree in Biochemistry and Molecular Biology. Additional specific requirements for BA and BS degrees are indicated at right.

Department	Required Courses	BA s.h.	BS s.h.
Biochemistry & Molecular Biology	Biochemistry & Molecular Biology I (BMB 3120) Biochemistry & Molecular Biology I II (BMB 3130)	6	6
	Experimental Biochemistry (BMB 3140)	3	3
Biology	Foundations of Biology (BIOL 1411) Diversity of Form and Function (BIOL 1412)	8	8
Chemistry	Principles of Chemistry I (CHEM 1110) Principles of Chemistry II (CHEM 1120)	8	8
Organic Chemistry	Organic Chemistry I (CHEM 2210) or Organic Chemistry I for Majors (CHEM 2230)	6	6
	Organic Chemistry II (CHEM 2220) or Organic Chemistry II for Majors (CHEM 2240)		
	Organic Chemistry Lab (CHEM 2410) or Organic Chemistry Lab for Majors (CHEM 2420)	3	3
Mathematics	Calculus I (MATH 1850) or Engineering Mathematics I: Single Variable Calculus (MATH 1550) or Calculus for Biological Sciences (MATH 1460)	4	4
	Calculus II (MATH 1860) or Engineering Mathematics II: Multivariable Calculus (MATH 1560) or Biostatistics (STAT 3510) or Introduction to Biostatistics (BIOS 4120)	3-4	3-4
Physics	College Physics I (PHYS 1511) or Introductory Physics I (PHYS 1611)	8	8
	College Physics II (PHYS 1512) or Introductory Physics II (PHYS 1612)		
Additional Course Requirements Specific for BA and BS Degrees			
Biochemistry & Molecular Biology	Biophysics and Advanced Biochemistry (BMB 4240)	3	3
Chemistry	Principles of Physical Chemistry (CHEM 4430) or Chemical Thermodynamics I (CHEM 4431) or Quantum Mechanics & Chemical Kinetics (CHEM 4432)	--	3
Multiple	Advanced Science Electives (see examples on page 7)	6	9
Biochemistry & Molecular Biology and Multiple	Advanced Undergraduate Biochemistry Research (BMB 4999) or Advanced Laboratory Courses (see page 7)	6	9
Biochemistry & Molecular Biology	Development of Senior Research Project (BMB 3150) is a prerequisite for BMB 4999.	2*	2*

*BMB 3150 is required for students taking BMB 4999 **but not** required for BS students taking advanced lab courses or BA students not performing mentored laboratory research.

The Bachelor of Arts with a major in Biochemistry and Molecular Biology requires a minimum of 120 s.h., including 58 s.h. of work for the major. The Bachelor of Science with a major in Biochemistry and Molecular Biology requires a minimum of 120 s.h., including 70-72 s.h. of work for the major. Students must also complete the College of Liberal Arts and Sciences General Education Program. (<http://clas.uiowa.edu/students/students-graduation-requirements/general-education-program-requirements>).

Advanced Chemistry and Biochemistry & Molecular Biology Courses Required for BA and BS Degrees

BA and BS majors need to complete:

BMB 4240 Biophysics and Advanced Biochemistry

This course covers the principles and experimental approaches used to study macromolecular structure, stability, and function; ligand binding and macromolecular interactions; enzyme kinetics and mechanisms; x-ray crystallography and NMR spectroscopy; single molecule and other biophysical approaches.

Prerequisite courses: BMB:3120 with a minimum grade of C- and BMB:3130 with a minimum grade of C-

Requirements: One year of Biochemistr.

Recommendations: Physical Chemistry course and one semester of calculus

BS majors also need any one of these courses:

CHEM 4430 Principles of Physical Chemistry

This course covers kinetics, transport properties, elementary thermodynamics, and selected topics in quantum mechanics and spectroscopy; emphasis on application of chemistry to areas of science including health and biosciences, environmental sciences, and related areas.

Requirements: CHEM:1120 and MATH:1460 or MATH:1850 and PHYS:1512 or PHYS:1612

CHEM 4431 Chemical Thermodynamics:

This course covers chemical thermodynamics and its application to chemical equilibrium, phase changes and chemical equilibria; ideal and real gases; kinetic theory; surface absorption and electrochemistry; thermodynamics.

Requirements: CHEM:1120 and MATH:1560 or MATH:1860 and PHYS:1512 or PHYS:1612

CHEM 4432 Quantum Mechanics & Chemical Kinetics

This course covers quantum mechanics and its application to atomic and molecular structure; determination of structure and bonding by various spectroscopic methods; chemical kinetics.

Requirements: CHEM:1120 and MATH:1560 or MATH:1860 and PHYS:1512 or PHYS:1612