Biochemistry and Molecular Biology, BA

The curriculum for the BA with a major in biochemistry and molecular biology is identical to the BS degree in the first two years of study.

Requirements

The Bachelor of Arts with a major in biochemistry and molecular biology requires a minimum of 120 s.h., including at least 58 s.h. of work for the major. Students must maintain a grade-point average (GPA) of at least 2.00 in all courses for the major and in all UI courses for the major. They must also complete the College of Liberal Arts and Sciences GE CLAS Core.

The biochemistry and molecular biology major for the Bachelor of Arts degree provides a rigorous education in biochemical concepts and practice in the laboratory while giving students flexibility to specialize in additional disciplines and to obtain clinical volunteer experience. The BA program is intended for most students majoring in biochemistry and molecular biology, including those with pre-medicine, pre-pharmacy, pre-dental, and other pre-health professions interests. It also is appropriate for students earning more than one major.

Qualified students may graduate with honors in the biochemistry and molecular biology major; visit "Honors in the Major" under Honors [p. 2] in this section of the catalog.

The BA with a major in biochemistry and molecular biology requires the following coursework.

Requirements	Hours
Common Requirements	52-53
Additional Requirements	6

Common Requirements

Students complete the following during their first three years.

Course #	Title	Hours
All of these:		
BMB:3120 & BMB:3130	Biochemistry and Molecular Biology I and Biochemistry and Molecular Biology II	6
BMB:3140	Experimental Biochemistry	3
BMB:4240	Biophysics and Advanced Biochemistry	3
BIOL:1411 & BIOL:1412	Foundations of Biology and Diversity of Form and Function	8
CHEM:1110 & CHEM:1120	Principles of Chemistry I and Principles of Chemistry II	8
CHEM:2210	Organic Chemistry I	3
or CHEM:2230	Organic Chemistry I for Majors	
CHEM:2220	Organic Chemistry II	3
or CHEM:2240	Organic Chemistry II for Majors	
CHEM:2410	Organic Chemistry Laboratory	3
or CHEM:2420	Organic Chemistry Laboratory for Majors	
MATH:1850	Calculus I	4
or MATH:1550	Engineering Calculus I	
or MATH:1460	Calculus for the Biological Sciences	
PHYS:1511	College Physics I	4
or PHYS:1611	Introductory Physics I	
PHYS:1512	College Physics II	4
or PHYS:1612	Introductory Physics II	
One of these:		
BIOS:4120	Introduction to Biostatistics	3
MATH:1560	Engineering Calculus II	4
MATH:1860	Calculus II	4
STAT:3510	Biostatistics	3

Additional Requirements

In addition to the common requirements listed, students must complete the following.

Course #	Title	Hours
Advanced science electives, as listed in the student handbook.		6

Students intending to earn advanced degrees in the biological or health sciences are advised to enroll in BMB:3993 Undergraduate Biochemistry Research or BMB:4999 Advanced Undergraduate Biochemistry Research for independent research. There are no prerequisites for BMB:3993. The course involves experience in an active biochemistry and molecular biology research lab, which must be arranged ahead of time with a supervising faculty member. Students may make arrangements directly with the faculty member, or they may request assistance from an undergraduate advisor. Credit earned in BMB:3993 does not count toward the major, but it does count toward the minimum of 120 s.h. required to graduate.

Before students register for BMB:4999 Advanced Undergraduate Biochemistry Research, they must have completed BMB:3120 Biochemistry and Molecular Biology I, BMB:3130 Biochemistry and Molecular Biology II, BMB:3140 Experimental Biochemistry, and BMB:3150 Development of Senior Research Project, with a grade of B-minus or higher in each course. Students are required to have prior research experience, such as in BMB:3993 Undergraduate Biochemistry Research, URES:3992 Undergraduate Research and Creative Projects, URES:3994 Undergraduate Research and Creative Projects, or HONR:3994 Honors Research Practicum, and permission of the instructor.

Teacher Licensure

Students interested in teaching in elementary and/or secondary schools should seek admission to the Teacher Education Program (TEP) in the College of Education.

To qualify for licensure in secondary teaching, students in the TEP complete a degree in education as well as a related College of Liberal Arts and Sciences degree. Visit Apply on the College of Education website for details on requirements and deadlines for applying to the College of Education and about TEP choices of majors leading to licensure.

Honors

Honors in the Major

Students have the opportunity to graduate with honors in the major. They must maintain a cumulative University of Iowa grade-point average (GPA) of at least 3.33 and a GPA of at least 3.33 in coursework for the major. They must earn 6 s.h. in BMB:4999 Advanced Undergraduate Biochemistry Research and present their research results as a written manuscript and in an oral presentation given at the Lata Undergraduate Research Symposium.

University of Iowa Honors Program

In addition to honors in the major, students have opportunities for honors study and activities through membership in the University of Iowa Honors Program. Visit Honors at Iowa to learn about the university's honors program.

Membership in the UI Honors Program is not required to earn honors in the biochemistry and molecular biology major.

Career Advancement

Biochemistry and molecular biology graduates with bachelor's degrees often work as research assistants in industry, government, academia, or health services; teach in secondary schools; or go on to advanced study in medicine, dentistry, or other areas. The program offers solid preparation for careers in biochemistry, medicine, biology, chemistry, dentistry, research, or related sciences. About one-third of biochemistry and molecular biology majors go on to study medicine; others enter graduate programs or professional degree programs.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.

Academic Plans

Four-Year Graduation Plan

The following checkpoints list the minimum requirements students must complete by certain semesters in order to stay on the university's Four-Year Graduation Plan. Courses in the major are those required to complete the major; they may be offered by departments other than the major department.

Before the third semester begins: CHEM:1110 Principles of Chemistry I, CHEM:1120 Principles of Chemistry II, and two semesters of advanced math (e.g., Calculus I, Calculus II, or Biostatistics).

Before the fifth semester begins: BIOL:1411 Foundations of Biology, BIOL:1412 Diversity of Form and Function, CHEM:2210 Organic Chemistry I or CHEM:2230 Organic Chemistry I for Majors, CHEM:2220 Organic Chemistry II or CHEM:2240 Organic Chemistry II for Majors, and CHEM:2410 Organic Chemistry Laboratory or CHEM:2420 Organic Chemistry Laboratory for Majors.

Before the seventh semester begins: PHYS:1611 Introductory Physics I or PHYS:1511 College Physics I, PHYS:1612 Introductory Physics II or PHYS:1512 College Physics II, BMB:3120 Biochemistry and Molecular Biology I, BMB:3130 Biochemistry and Molecular Biology II, BMB:3140 Experimental Biochemistry, a science elective, and at least 90 s.h. earned toward the degree.

Before or during the eighth semester: BMB:4240 Biophysics and Advanced Biochemistry, a science elective, and all remaining coursework in the major, all remaining GE CLAS Core courses, and a minimum of 120 total s.h. to graduate.

Sample Plan of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, visit MyUI.

Biochemistry and Molecular Biology, BA

Course	Title	Hours
Academic Career		
Any Semester		
Students in good academic standing can switch from the BA to the BS degree program after completing one semester of organic chemistry (CHEM:2210 Organic Chemistry I or CHEM:2230 Organic Chemistry I for Majors).		
GE CLAS Core: Sustainability [a]		
	Hours	**0**
First Year		
Fall		
CHEM:1110	Principles of Chemistry I [b, c]	4
MATH:1850 or MATH:1460 or MATH:1550	Calculus I [b, d] or Calculus for the Biological Sciences or Engineering Calculus I	4
ENGL:1200 or RHET:1030	Interpreting Literature or Rhetoric: Writing and Communication	3 - 4
CSI:1600	Success at Iowa	1
Elective course [e]		3
	Hours	**15-16**
Spring		
CHEM:1120	Principles of Chemistry II [b]	4
Major Elective: biostatistics/calculus course [f]		3 - 4
ENGL:1200 or RHET:1030	Interpreting Literature or Rhetoric: Writing and Communication	3 - 4
GE CLAS Core: Understanding Cultural Perspectives [g]		3
Elective course [e]		2
	Hours	**15-17**
Second Year		
Fall		
BIOL:1411	Foundations of Biology [b]	4
CHEM:2210 or CHEM:2230	Organic Chemistry I or Organic Chemistry I for Majors	3
GE CLAS Core: Historical Perspectives [g]		3
GE CLAS Core: World Languages First Level Proficiency or elective course [h]		4 - 5
Elective course [e]		1
	Hours	**15-16**

Spring		
BIOL:1412	Diversity of Form and Function [b]	4
CHEM:2220 or CHEM:2240	Organic Chemistry II or Organic Chemistry II for Majors	3
CHEM:2420 or CHEM:2410	Organic Chemistry Laboratory for Majors or Organic Chemistry Laboratory	3
GE CLAS Core: World Languages Second Level Proficiency or elective course [h]		4 - 5
Elective course [e]		1
	Hours	**15-16**
Third Year		
Fall		
BMB:3120	Biochemistry and Molecular Biology I	3
PHYS:1511 or PHYS:1611	College Physics I [b] or Introductory Physics I	4
GE CLAS Core: Values and Society [g]		3
GE CLAS Core: World Languages Third Level Proficiency or elective course [h]		4 - 5
Elective course [e]		2
	Hours	**16-17**
Spring		
BMB:3130	Biochemistry and Molecular Biology II	3
BMB:3140	Experimental Biochemistry	3
PHYS:1612 or PHYS:1512	Introductory Physics II [b] or College Physics II	4
GE CLAS Core: Literary, Visual, and Performing Arts [g]		3
GE CLAS Core: World Languages Fourth Level Proficiency or elective course [h]		4 - 5
	Hours	**17-18**
Fourth Year		
Fall		
BMB:4240	Biophysics and Advanced Biochemistry	3
Major Elective: advanced science elective [i]		3
Major Elective: research, independent study, or elective course [e, j]		3
GE CLAS Core: International and Global Issues [g]		3
Elective course [e]		3
	Hours	**15**
Spring		
Major Elective: advanced science elective [i]		3
Major Elective: research, independent study, or elective course [e, j]		3
GE CLAS Core: Social Sciences [g]		3
Elective course [e]		3
Elective course [e]		3
Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall) [k]		
	Hours	**15**
	Total Hours	**123-130**

a Sustainability must be completed by choosing a course that has been approved for Sustainability AND for one of these General Education areas: Natural Sciences; Quantitative or Formal Reasoning; Social Sciences; Historical Perspectives; International and Global Issues; Literary, Visual, and Performing Arts; or Values and Society.

b Fulfills a major requirement and may fulfill a GE requirement.

c Enrollment in chemistry courses requires completion of a placement exam.

d Enrollment in math courses requires completion of a placement exam.

e Students may use elective courses to earn credit toward the total s.h. required for graduation or to complete a double major, minors, or certificates.

f Choose from BIOS:4120, MATH:1560, MATH:1860, STAT:3510.

g GE CLAS Core courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses.

h Students who have completed four levels of a single language or two levels of two different languages in high school or college have satisfied the GE CLAS Core World Languages requirement. Students who have completed three levels of a single language may complete a fourth-level course in the same language or may choose an approved World Language and Cultural Exploration course. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course. Contact your academic advisor or CLAS Undergraduate Programs Office with questions concerning the World Languages requirement.

i Students are required to complete 6 s.h. in advanced science electives approved by BMB advisor.

j Students intending to earn advanced degrees in the biological or health sciences are advised to enroll in BMB:3993 or BMB:4999 for independent research. Consult with BMB advisor regarding appropriate coursework and sequence.

k Please see Academic Calendar, on Office of the Registrar website, for current degree application deadlines. Students should apply for a degree for the session in which all requirements will be met. For any questions on appropriate timing, contact your academic advisor or Degree Services.