

# BIOCHEMISTRY (BA)

The recommended course sequence for the baccalaureate degree in biochemistry fulfills all requirements for pre-professional preparation in medicine, dentistry, medical technology, pharmacy, veterinary medicine, and other health-related programs when electives are selected according to course recommendations for the chosen pre-professional track.

Benedictine College offers majors leading to the Bachelor of Science (B.S.) and the Bachelor of Arts (B.A.) degree in biochemistry. Biochemistry majors will not be awarded a minor in biology or chemistry.

For biochemistry majors, a GPA of at least 2.00 must be maintained in all courses with a "CHEM" prefix taken to date. A grade of at least "C–" must be achieved in all required courses for the major with a 2.0 required in the major to graduate. A grade of "C" or better is required for all prerequisites. Courses required for the major may be repeated, but students must satisfactorily pass all required courses in their first or second attempt.

## Program Mission

The mission of the Biochemistry program is to train ethically-grounded, critically-thinking students to apply knowledge of the chemistry of living organisms to solve real-world problems and to prepare them for employment in biochemistry and related fields, graduate studies in biochemistry, or professional studies in the health sciences through a community of faith and scholarship.

## Program Outcomes

1. Graduates will be able to explain fundamental concepts and solve problems in quantitative, biological, inorganic, organic and physical chemistry.
2. Graduates will display proficiency in fundamental laboratory skills, including safety and use of instrumentation and computers and in the application of the scientific method.
3. Graduates will be able to communicate scientific results via oral and written reports with effective use of scientific literature.
4. Graduates will be aware of major ethical issues at the forefront of their discipline and apply ethical principles of the discipline in regard to treatment of experimental data, use of sources, and in collaboration with colleagues in light of cultural differences present in a diverse and multicultural society.

## Program Requirements

Code	Title	Hours
<b>Required Courses</b>		
BIOL-1121	General Biology I	5
BIOL-1122	General Biology II	4
CHEM-1200 & CHEM-1201	General Chemistry I Lecture and General Chemistry I Lab	4
CHEM-1210 & CHEM-1211	General Chemistry II Lecture and General Chemistry II Lab	4
CHEM-2200 & CHEM-2201	Organic Chemistry I Lecture and Organic Chemistry I Lab	4
CHEM-2210 & CHEM-2211	Organic Chemistry II Lecture and Organic Chem II Lab	4
CHEM-3300 & CHEM-3301	Quantitative Analysis and Quantitative Analysis Lab	4
CHEM-3311	Instrumental Analysis Lab	1

CHEM-3500 & CHEM-3501	Biochemistry I and Biochemistry I Lab	4
CHEM-3510 & CHEM-3511	Biochemistry II and Biochemistry II Lab	4
CHEM-4450 & CHEM-4451	Topics in Biochemistry and Topics in Biochemistry Lab	4
CHEM-4900 & CHEM-4901 & CHEM-4902 & CHEM-4903	Chemistry & Biochem Colloquium and Chem & Biochem Colloquium 2 and Chem & Biochem Colloquium 3 and Chem & Biochem Colloquium 4	4
BIOC-COMP	Senior Comprehensive Exam	0

### Advanced Course

Select one of the following:		3
CHEM-3150	Computational Chemistry	
CHEM-3250	Environmental Chemistry	
CHEM-3400	Inorganic Chemistry	
CHEM-3650	Polymer Chemistry	
CHEM-3800	Physical Chemistry I	
CHEM-3980/49	Special Topics	
CHEM-4350	Advanced Organic Chemistry I	
CHEM-4650	Organometallic Chemistry	

### Required Supporting Courses

MATH-1300	Calculus I	4
MATH-1350	Calculus II	4
PHYS-2100 & PHYS-2101	Classical Physics I and Introductory Physics Laboratory I	4
PHYS-2110 & PHYS-2111	Classical Physics II and Introductory Physics Lab II	4

### Recommended Supporting Courses

BIOL-3310	Biology III- Mechanisms of Evolution	
BIOL-3360	Microbiology	
BIOL-3370	Genetics	
BIOL-4475	Molecular & Cell Biology	
BIOL-4476	Immunology	

**Total Hours** 65

## Suggested Sequence of Courses for a Bachelor of Arts Degree in Biochemistry

Course	Title	Hours
<b>Freshman Year</b>		
<b>First Semester</b>		
BIOL-1121	General Biology I	5
CHEM-1200	General Chemistry I Lecture	3
CHEM-1201	General Chemistry I Lab	1
MATH-1300	Calculus I	4
ENGL-1010	English Composition	3
<b>Hours</b>		<b>16</b>
<b>Second Semester</b>		
BIOL-1122	General Biology II	4
CHEM-1210	General Chemistry II Lecture	3
CHEM-1211	General Chemistry II Lab	1
MATH-1350	Calculus II	4
THEO-1100	Introduction to Theology	3

EXSC-1115	Wellness for Life	1
<b>Hours</b>		<b>16</b>
<b>Sophomore Year</b>		
<b>First Semester</b>		
CHEM-2200	Organic Chemistry I Lecture	3
CHEM-2201	Organic Chemistry I Lab	1
PHYS-2100	Classical Physics I	3
PHYS-2101	Introductory Physics Laboratory I	1
Historical Inquiry Foundation		3
Person and Community Foundation		3
Elective		3
<b>Hours</b>		<b>17</b>
<b>Second Semester</b>		
CHEM-2210	Organic Chemistry II Lecture	3
CHEM-2211	Organic Chem II Lab	1
PHYS-2010	College Physics II	3
PHYS-2011	College Physics Lab II	1
Aesthetic Foundation		3
Historical Inquiry Foundation		3
PHIL-2100	Principles of Nature	3
<b>Hours</b>		<b>17</b>
<b>Junior Year</b>		
<b>First Semester</b>		
CHEM-3300	Quantitative Analysis	3
CHEM-3301	Quantitative Analysis Lab	1
CHEM-3500	Biochemistry I	3
CHEM-3501	Biochemistry I Lab	1
CHEM-4900	Chemistry & Biochem Colloquium	1
Philosophical Inquiry Foundation		3
Foreign Language		4
<b>Hours</b>		<b>16</b>
<b>Second Semester</b>		
CHEM-3311	Instrumental Analysis Lab	1
CHEM-3510	Biochemistry II	3
CHEM-3511	Biochemistry II Lab	1
Advanced Chemistry Elective		3
CHEM-4901	Chem & Biochem Colloquium 2	1
Faith Foundation		3
Foreign Language		4
<b>Hours</b>		<b>16</b>
<b>Senior Year</b>		
<b>First Semester</b>		
CHEM-4450	Topics in Biochemistry	3
CHEM-4451	Topics in Biochemistry Lab	1
CHEM-4801	Research I	1
CHEM-4902	Chem & Biochem Colloquium 3	1
Aesthetic Foundation		3
Faith Foundation		3
Elective		3
EXSC Fitness Course		1
<b>Hours</b>		<b>16</b>

**Second Semester**

CHEM-4811	Research II	1
CHEM-4903	Chem & Biochem Colloquium 4	1
CHEM-COMP	Senior Comprehensive Exam	NULL
Electives		9-10
Philosophical Inquiry Foundation		3
<b>Hours</b>		<b>14-15</b>
<b>Total Hours</b>		<b>128-129</b>