

# BIOCHEMISTRY, BS

The BS degree in Biochemistry provides thorough training in the fundamental principles and experimental techniques of chemistry and biology as they apply to biological systems, and emphasizes the interdisciplinary nature of these sciences. This program prepares students for a wide variety of careers, including biological, chemical, or biochemical research, secondary education teaching, or employment in the health sciences, government, or industry. The Biochemistry major may lead to work in interdisciplinary sciences such as biotechnology, forensics, environmental science, or pharmacology, and it is well suited to the needs of students interested in pre-health professional programs, including pre-medical, pre-veterinary, and pre-pharmacy.

Biochemistry majors interested in teaching science at the elementary or secondary level should meet with an advisor early in their program to plan an appropriate course sequence. Biochemistry majors with strong academic backgrounds are encouraged to apply to the Roosevelt Scholars Program.

## Standards

All courses applying to the biochemistry major, including required supporting courses, must be passed with a grade of C- or higher and a minimum cumulative GPA of 2.0.

## Requirements

- Courses applying to the Biochemistry major, including required supporting courses, must be taken on a letter grade basis.
- At least 25 credit hours of the required Biochemistry, Chemistry and/or Biology courses must be completed at Roosevelt University.
- All Biochemistry, Chemistry, and Biology courses must be taken within eight years of graduation to be accepted for credit without examination.
- Entering students with a score of at least 4 on the AP chemistry exam receive 3 credit hours of CHEM 1xx AP Chemistry credit and are waived from CHEM 201 GENERAL CHEMISTRY I. Students with a 3 on the AP chemistry exam receive 3 credit hours of CHEM 1xx AP Chemistry credit and satisfy the physical science general education lecture requirement.
- B.S. Biochemistry majors may not minor in either biology or chemistry. A mathematics minor is encouraged, but no minor is required.

Code	Title	Credit Hours
<b>Biology Core</b>		<b>15</b>
BIOL 201	ORGANISMIC BIOLOGY (3 credit hour lecture, 2 credit hour lab) <sup>1</sup>	
BIOL 202	ECOLOGY, EVOLUTION, AND GENETICS (3 credit hour lecture, 2 credit hour lab)	
BIOL 301	CELLULAR & MOLECULAR BIOLOGY (3 credit hour lecture, 2 credit hour lab)	
<b>Chemistry Core</b>		<b>25</b>
CHEM 201	GENERAL CHEMISTRY I (3 credit hour lecture, 2 credit hour lab)	
CHEM 202	GENERAL CHEMISTRY II (3 credit hour lecture, 2 credit hour lab)	

CHEM 211	ORGANIC CHEMISTRY I (3 credit hour lecture, 2 credit hour lab)	
CHEM 212	ORGANIC CHEMISTRY II (3 credit hour lecture, 2 credit hour lab)	
CHEM 237	QUANTITATIVE ENVIRONMENTAL ANALYSIS (3 credit hour lecture, 2 credit hour lab)	
<b>Biochemistry Core</b>		<b>10</b>
BCHM 355	BIOCHEMISTRY (3 credit hour lecture)	
BCHM 356	EXPERIMENTAL METHODS IN BIOCHEMISTRY & BIOTECHNOLOGY (3 credit hour lecture and lab)	
BCHM 357	ADVANCED BIOCHEMISTRY (3 credit hour lecture)	
BCHM 393	BIOCHEMISTRY SEMINAR (1 credit hour seminar)	
<b>Physical Chemistry Core</b>		<b>3</b>
BCHM 320	PHYSICAL CHEMISTRY FOR BIOSCIENCE (3 credit hour lecture)	
<b>Advanced electives</b>		<b>8-10</b>
At least two additional BCHM, BIOL or CHEM courses, including at least two disciplines and at least one laboratory. Up to 3 credit hours of CHEM, BIO or BCHM research may be applied to this requirement. <sup>2</sup>		
BIOL 3XX: Advanced biology elective, above BIO 301		
CHEM 3XX: Advanced chemistry elective, 300 level		
BCHM 3XX: Advanced biochemistry elective, 300 level		
<b>Supporting Sequence</b>		<b>20</b>
MATH 231	CALCULUS I (5 credit hours)	
MATH 232	CALCULUS II (5 credit hours)	
PHYS 201	INTRODUCTION TO NON-CALCULUS BASED PHYSICS I (4 credit hours)	
PHYS 202	INTRO TO NON-CALCULUS PHYSICS II (4 credit hours)	
PHYS 233	CALCULUS-BASED PHYSICS I DISCUSSION (1 credit hours)	
PHYS 234	CALCULUS-BASED PHYSICS II DISCUSSION (1 credit hours)	
<b>General Education Requirements including University Writing Requirement</b> <sup>3,4,5</sup>		<b>39</b>
See College of Arts & Sciences General Education Requirements below, as well as footnotes 3-5		
<b>Total Credit Hours</b>		<b>120-122</b>

<sup>1</sup> With the approval of an advisor, B.S. Biochemistry majors with a pre-pharmacy designation may substitute BIOL 201 Organismic Biology (5 credit hours) with the combination of BIOL 123 Anatomy & Physiology I (4 credit hours) plus BIOL 124 Anatomy & Physiology II (4 credit hours) for a total of 8 credit hours.

<sup>2</sup> To apply to the major, undergraduate research should be a substantive laboratory or computational project, approved by the chemistry/biochemistry program chair, performed under the direction of a faculty sponsor, resulting in a report, paper, poster or presentation, and completed with a minimum acceptable grade of C. Each credit hour of BIOL, CHEM or BCHM 392 requires the equivalent of 3 credit hours of active research per week over a 15 week semester.

<sup>3</sup> B.S. Biochemistry majors satisfy the general education mathematics requirement through the major (MATH 231).

<sup>4</sup> B.S. Biochemistry majors satisfy all science general education requirements, including biology, physical science and laboratory requirements through the major.

<sup>5</sup> B.S. Biochemistry majors are highly encouraged to fill one of their social science or humanities general education electives with a course that simultaneously satisfies the experiential learning attribute. Additionally, B.S. Biochemistry majors intending to pursue graduate programs in pharmacy should fulfill one social science requirement with ECON 101 or ECON 102, and should fulfill one humanities general education requirement with SPCH 101.

- Students must apply no fewer than 60 credit hours of 200- and 300-level courses toward the degree.
- Students must have at least 18 credit hours (of the 60 credit hours above) at the 300 level.
- Students may transfer in no more than 70 credit hours from community colleges.
- Students must take their final 30 hours at Roosevelt University. Note that some majors have additional requirements for RU hours.
- Students must have a grade point average of 2.0 or higher to graduate. Note that some majors have additional GPA requirements.
- Students may apply no more than 51 hours in the major (BA) or 57 hours in the major (BS)

## CORE Requirements (General Education)

Code	Title	Credit Hours
<b>First Year Success Course or Transfer Success Course</b>		
FYS 101	FIRST YEAR SUCCESS COURSE	1
or TRS 101	TRANSFER SUCCESS 101	
<b>Communication Requirement</b>		
ENG 101	COMPOSITION I: CRITICAL READING & WRITING	3
ENG 102	COMPOSITION II: INTRODUCTION TO ACADEMIC RESEARCH	3
LIBS 201	WRITING SOCIAL JUSTICE ( Transfer students with acceptable communication credit may be exempt from this requirement.)	3
<b>Ideas Across Disciplines</b>		
3 credits in coursework categorized as Ideas.		3
<b>Humanities and Fine and Performing Arts</b>		
9 credits from the following subject areas: African-American Studies, Art History, English (excluding ENG 101 and ENG 102), History, Languages, Music, Philosophy, Theatre, Speech and Women's and Gender Studies		9
<b>Mathematics</b>		
MATH 110	QUANTITATIVE LITERACY (or above)	3
<b>Science</b>		
One biological science and one physical science required (at least one must be a four-hour lab). (Not applicable for science majors)		7-8
<b>Social Sciences</b>		
9 credits from the following subject areas: African-American Studies, Anthropology, Economics, History, Journalism, Philosophy, Political Science, Psychology, Sociology and Women's and Gender Studies		9
<b>Experiential Learning</b>		
6 credits from coursework categorized as Experiential Learning.		
Total Credit Hours		41-42

These quantitative requirements also apply to degrees in the College of Arts and Sciences:

- Students must earn a minimum of 120 semester hours.
- Students may apply no more than 60 credit hours of 100-level courses toward the degree.

Your degree map is a general guide suggesting courses to complete each term on the academic pathway to your degree. It is based on the most current scheduling information from your academic program. Your program's degree map is reviewed annually and updated as schedules change (although you retain the same course requirements as long as you are continuously enrolled in your degree program).

Always work closely with your academic advisor to understand curriculum requirements and scheduling, as each student's academic plan can look slightly different.

### Year 1

Fall	Credit Hours	Spring	Credit Hours
FYS 101	1	Ideas Across Disciplines	3
CHEM 201	5	BIOL 201	5
MATH 121	3	CHEM 202	5
ENG 101	3	ENG 102	3
Social Science Course #1	3		
		15	16

### Year 2

Fall	Credit Hours	Spring	Credit Hours
BIOL 202	5	BIOL 301	5
CHEM 211	5	CHEM 212	5
MATH 217	3	MATH 122	3
Humanities Course #1	3	Social Science Course #2	3
		16	16

### Year 3

Fall	Credit Hours	Spring	Credit Hours
BCHM 355	3	BCHM 357	3
BCHM 356	3	BCHM 393	1
CHEM 237	5	MATH 232	5
MATH 231	5	Humanities Course #2	3
		Experiential Learning Course #1 <sup>2</sup>	3
		16	15

### Year 4

Fall	Credit Hours	Spring	Credit Hours
PHYS 201	4	BCHM 320	3

BIOL 3XX, CHEM 3XX, or BCHM 3XX	3 PHYS 202	4
BIOL 3XX, CHEM 3XX, or BCHM 3XX	3 PHYS 234	1
PHYS 233	1 Social Science Course #3	3
Experiential Learning Course #2 <sup>2</sup>	3 Humanities Course #3	3
	LIBS 201	3
	14	17

Total Credit Hours 125

<sup>1</sup> Or any other course at the 300 level within the discipline except BIOL 301.

<sup>2</sup> Experiential Learning class must be 200/300 level. Satisfies CORE Experiential Learning requirement. EXL courses can satisfy major requirements/electives or CORE requirement.