

# Chemistry - Biochemistry Emphasis, B.S.

Biochemistry studies the chemical composition of living things. Biochemistry combines the study of biology with organic and inorganic chemistry as applied to topics such as enzymology, genetics, toxicology, pharmacology, food science, and medicine. Students with this degree may pursue graduate study or work in the field of biotechnology or in one of the many related areas or be eligible for many employment opportunities in chemistry and biology.

## Matriculation Requirements

To matriculate into the Chemistry degree, students must have adviser approval, and completed CHEM 1210, CHEM 1220, CHEM 1250, and CHEM 1260 all with a C- or higher.

## Program Requirements

Code	Title	Credit Hours
<b>Total Credit Hours</b>		<b>120</b>
<b>Chemistry Requirements</b>		<b>80 Credits</b>
Complete the requirements		80
<b>Emphasis Requirements</b>		<b>40 Credits</b>
BIOL 3400	Cell Biology	3
BIOL 3405	Cell Biology Laboratory	1
CHEM 3060	Physical Chemistry I WE	4
CHEM 3065	Physical Chemistry I Lab	1
CHEM 3100	Advanced Inorganic Chemistry	4
CHEM 3115	Advanced Inorganic Chemistry Lab	1
CHEM 3620	Biological Chemistry II	3
Chemistry Electives (12 credits) from the following:		12
CHEM 3020	Environmental Chemistry (3)	
CHEM 3025	Environmental Chemistry Laboratory (1)	
CHEM 3300	Biomolecular Modeling and Simulations (4)	
CHEM 3800	Energy Use on Earth GI (3)	
CHEM 4030	Radiochemistry (3)	
CHEM 4600	Structure Determination (3)	
CHEM 4605	Structure Determination Laboratory (1)	
CHEM 482R	Chemistry Internship (1-4)	
CHEM 489R	Undergraduate Research in Chemistry (1-4)	
CHEM 495R	Advanced Topics in Organic Chemistry (3)	
CHEM 496R	Special Topics in Chemistry (1-4)	
CHEM 499R	Independent Study and Research (1-4)	
CHEM 4800	Pharmacology (3)	
Biology Electives (11 credits) from the following:		11
BIOL 3500	Genetics (3)	
BIOL 3300	Developmental Biology (3)	
BIOL 3515	Advanced Genetics Laboratory (1)	
BIOL 3550	Molecular Biology (3)	
BIOL 4300	Bioinformatics and Genome Analysis (4)	
BIOL 4550	Molecular Evolution and Bioinformatics WE (3)	
BIOL 4450	Immunology (3)	
BIOL 4455	Immunology Laboratory (1)	
MICR 3450	General Microbiology (3)	
MICR 3455	General Microbiology Laboratory (1)	
ZOOL 2320 & ZOOL 2325	Human Anatomy and Human Anatomy Laboratory (4)	

ZOOL 2420 & ZOOL 2425	Human Physiology and Human Physiology Laboratory (4)
ZOOL 4300	Histology (4)
ZOOL 4700	Advanced Anatomy (4)
ZOOL 4780	Neuroscience (4)

## Core Requirements

Code	Title	Credit Hours
<b>Total Credit Hours</b>		<b>80</b>
<b>General Education Requirements</b>		<b>39 Credits</b>
ENGL 1010 or ENGH 1005	Introduction to Academic Writing CC Literacies and Composition Across Contexts CC	3
ENGL 2010	Intermediate Academic Writing CC	3
MATH 1210	Calculus I QL	4
Complete one of the following:		3
HIST 1700	American Civilization AS (3)	
HIST 2700 & HIST 2710	US History to 1877 AS and US History since 1877 AS (6)	
HIST 1740	US Economic History AS (3)	
POLS 1000	American Heritage AS (3)	
POLS 1100	American National Government AS (3)	
Complete the following:		
PHIL 2050 or PHIL 205G or PHIL 205H	Ethics and Values IH Ethics and Values IH GI Ethics and Values IH	3
HLTH 1100 or EXSC 1097	Personal Health and Wellness TE Fitness for Life TE	2
Distribution Courses:		
BIOL 1610	College Biology I BB	4
CHEM 1210	Principles of Chemistry I PP <sup>1</sup>	4
CHEM 1220	Principles of Chemistry II PP <sup>2</sup>	4
Fine Arts		3
Humanities		3
Social/Behavioral Science		3
<b>Discipline Core Requirements</b>		<b>41 Credits</b>
CHEM 1215	Principles of Chemistry I Laboratory <sup>3</sup>	1
CHEM 1225	Principles of Chemistry II Laboratory <sup>4</sup>	1
CHEM 1250	Chemistry Cornerstone- Research and Careers	1
CHEM 1260	Chemistry Cornerstone- Ethics	1
BIOL 1615	College Biology I Laboratory	1
CHEM 2310	Organic Chemistry I	4
CHEM 2315	Organic Chemistry I Laboratory	1
CHEM 2320	Organic Chemistry II	4
CHEM 2325	Organic Chemistry II Laboratory	1
CHEM 3000	Analytical Chemistry	2
CHEM 3005	Analytical Chemistry Laboratory	2
CHEM 3600	Biological Chemistry	3
CHEM 3605	Biological Chemistry Lab	1
CHEM 4000	Instrumental Analysis WE	2
CHEM 4005	Instrumental Analysis Laboratory	2

MATH 1220	Calculus II	4
PHYS 2210	Physics for Scientists and Engineers I PP	4
PHYS 2220	Physics for Scientists and Engineers II PP	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1
PHYS 2225	Physics for Scientists and Engineers II Lab	1

1

To be taken with CHEM 1215 Principles of Chemistry I Laboratory

2

To be taken with CHEM 1225 Principles of Chemistry II Laboratory

3

To be taken with CHEM 1210 Principles of Chemistry I PP

4

To be taken with CHEM 1220 Principles of Chemistry II PP

## Graduation Requirements

1. Completion of a minimum of 120 semester credits with a minimum of 40 upper-division credits.
2. Overall grade point average of 2.0 (C) or above with a minimum of 2.25 in Major.
3. Residency hours -- minimum of 30 credit hours through course attendance at UVU, with at least 10 hours earned in the last 45 hours.
4. Completion of GE and specified departmental requirements.
5. A minimum of 54 credit hours must be in the major with a minimum of 20 credits taken at UVU. A minimum of 28 chemistry credits must be upper-division.
6. Complete all chemistry and physics courses with a minimum grade of "C-" or better.
7. Successful completion of at least one Global/Intercultural course.

## Graduation Plan

This graduation plan is a sample plan and is intended to be a guide. Your specific plan may differ based on your Math and English placement and/or transfer credits applied. You are encouraged to meet with an advisor and set up an individualized graduation plan in Wolverine Track (<http://www.uvu.edu/wolverinetrack/>).

### First Year

Semester 1		Credit Hours
ENGL 1010	Introduction to Academic Writing CC	3
MATH 1210	Calculus I QL	4
American Institutions Distribution		3
Fine Arts		3
Social/Behavioral Science		3
<b>Credit Hours</b>		<b>16</b>

<b>Semester 2</b>		
BIOL 1610	College Biology I BB	4
BIOL 1615	College Biology I Laboratory	1
CHEM 1210	Principles of Chemistry I PP	4
CHEM 1215	Principles of Chemistry I Laboratory	1
MATH 1220	Calculus II	4
ENGL 2010	Intermediate Academic Writing CC	3
<b>Credit Hours</b>		<b>17</b>

### Second Year

<b>Semester 3</b>		
PHYS 2210	Physics for Scientists and Engineers I PP	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1
CHEM 1220	Principles of Chemistry II PP	4
CHEM 1225	Principles of Chemistry II Laboratory	1
Humanities		3
<b>Credit Hours</b>		<b>13</b>

<b>Semester 4</b>		
CHEM 2310	Organic Chemistry I	4
CHEM 2315	Organic Chemistry I Laboratory	1
PHYS 2220	Physics for Scientists and Engineers II PP	4

PHYS 2225	Physics for Scientists and Engineers II Lab	1
HLTH 1100 or EXSC 1097	Personal Health and Wellness TE or Fitness for Life TE	2
Biology Elective		4
<b>Credit Hours</b>		<b>16</b>
<b>Third Year</b>		
<b>Semester 5</b>		
CHEM 2320	Organic Chemistry II	4
CHEM 2325	Organic Chemistry II Laboratory	1
CHEM 1250	Chemistry Cornerstone- Research and Careers	1
PHIL 205G	Ethics and Values IH GI	3
Biology Elective		4
<b>Credit Hours</b>		<b>13</b>
<b>Semester 6</b>		
BIOL 3400	Cell Biology	3
BIOL 3405	Cell Biology Laboratory	1
CHEM 1260	Chemistry Cornerstone- Ethics	1
CHEM 3000	Analytical Chemistry	2
CHEM 3005	Analytical Chemistry Laboratory	2
CHEM 3600	Biological Chemistry	3
CHEM 3605	Biological Chemistry Lab	1
Biology Elective		3
<b>Credit Hours</b>		<b>16</b>
<b>Fourth Year</b>		
<b>Semester 7</b>		
CHEM 3060	Physical Chemistry I WE	4
CHEM 3065	Physical Chemistry I Lab	1
CHEM 3100	Advanced Inorganic Chemistry	4
CHEM 3115	Advanced Inorganic Chemistry Lab	1
Upper-Division Chemistry Elective		6
<b>Credit Hours</b>		<b>16</b>
<b>Semester 8</b>		
CHEM 3620	Biological Chemistry II	3
CHEM 4000	Instrumental Analysis WE	2
CHEM 4005	Instrumental Analysis Laboratory	2
Upper-Division Chemistry Elective		6
<b>Credit Hours</b>		<b>13</b>
<b>Total Credit Hours</b>		<b>120</b>

## Program Learning Outcomes

1. Students will demonstrate progress along their desired career path.
2. Students are prepared to enter the chemistry workplace and postgraduate education.
3. Understand how physical scientists think and form judgments about the physical world.
4. Convey scientific ideas and knowledge clearly and professionally, in both written and oral forms.
5. Demonstrate the ability to apply chemical principles and laboratory skills to solve scientific problems.
6. Students will demonstrate knowledge of the unifying principles of chemistry.