

# Chemistry - Professional Chemistry Emphasis, B.S.

This bachelor's degree in professional chemistry prepares a student for employment as a chemist. It also prepares a student for further study in a graduate degree or professional program. This degree is designed to meet American Chemical standards for a bachelor degree. Job opportunities for students with this degree are very good. Students with this degree can have careers in test laboratories, government laboratories, hospital laboratories, research and development, quality control, manufacturing, and many other areas. In obtaining this degree, students will learn how to: Use modern scientific instruments and interpret results Apply principles used in chemistry to solve everyday problems Think analytically Use problem solving skills Categorize information Apply learned math skills Develop laboratory skills

## 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>
CHEM 3060	Physical Chemistry I WE	4
CHEM 3065	Physical Chemistry I Lab	1
CHEM 3070	Physical Chemistry II	4
CHEM 3075	Physical Chemistry II Lab	1
CHEM 3100	Advanced Inorganic Chemistry	4
CHEM 3115	Advanced Inorganic Chemistry Lab	1
MATH 2210	Calculus III	4
Chemistry Electives (21 credits) from the following:		21
CHEM 3020	Environmental Chemistry (3)	
CHEM 3025	Environmental Chemistry Laboratory (1)	
CHEM 3080	Physical Chemistry III (3)	
CHEM 3300	Biomolecular Modeling and Simulations (undefined)	
CHEM 3620	Biological Chemistry II (3)	
CHEM 3800	Energy Use on Earth GI (3)	
CHEM 4030	Radiochemistry (3)	
CHEM 4600	Structure Determination (3)	
CHEM 4605	Structure Determination Laboratory (1)	
CHEM 4800	Pharmacology (3)	
CHEM 482R	Chemistry Internship (1-4)	
CHEM 489R	Undergraduate Research in Chemistry (1-4)	
CHEM 491R	Advanced Topics in Inorganic Chemistry (3)	
CHEM 495R	Advanced Topics in Organic Chemistry (3)	
CHEM 496R	Special Topics in Chemistry (1-4)	
CHEM 499R	Independent Study and Research (1-4)	
MATH 2280	Ordinary Differential Equations (3)	
PHYS 2800	Introduction to Materials Physics (3)	
PHYS 3300	Mathematical and Computational Physics I (3)	
PHYS 3500	Thermodynamics (3)	
PHYS 4250	Nuclear Physics (3)	
PHYS 4510	Quantum Mechanics I (3)	

PHYS 4520	Quantum Mechanics II (3)
PHYS 4800	Solid State Physics (3)

## 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 ENGL 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
CHEM 1210	Principles of Chemistry I PP	4
CHEM 1215	Principles of Chemistry I Laboratory	1
MATH 1210	Calculus I QL	4
ENGL 1010	Introduction to Academic Writing CC	3
American Institutions		3
<b>Credit Hours</b>		<b>15</b>

<b>Semester 2</b>		
MATH 1220	Calculus II	4
CHEM 1220	Principles of Chemistry II PP	4
CHEM 1225	Principles of Chemistry II Laboratory	1
ENGL 2010	Intermediate Academic Writing CC	3
Social/Behavioral Science		3
<b>Credit Hours</b>		<b>15</b>

### Second Year

Semester 3		Credit Hours
BIOL 1610	College Biology I BB	4
BIOL 1615	College Biology I Laboratory	1
CHEM 2310	Organic Chemistry I	4
CHEM 2315	Organic Chemistry I Laboratory	1
Fine Arts		3
Humanities		3
<b>Credit Hours</b>		<b>16</b>

Semester 4		Credit Hours
CHEM 2320	Organic Chemistry II	4
CHEM 2325	Organic Chemistry II Laboratory	1
PHIL 205G	Ethics and Values IH GI	3
PHYS 2210	Physics for Scientists and Engineers I PP	4
PHYS 2215	Physics for Scientists and Engineers I Lab	1

HLTH 1100 or EXSC 1097	Personal Health and Wellness TE or Fitness for Life TE	2
<b>Credit Hours</b>		<b>15</b>
<b>Third Year</b>		
<b>Semester 5</b>		
CHEM 1250	Chemistry Cornerstone- Research and Careers	1
MATH 2210	Calculus III	4
PHYS 2220	Physics for Scientists and Engineers II PP	4
PHYS 2225	Physics for Scientists and Engineers II Lab	1
Chemistry Electives		5
<b>Credit Hours</b>		<b>15</b>
<b>Semester 6</b>		
CHEM 3000	Analytical Chemistry	2
CHEM 3005	Analytical Chemistry Laboratory	2
CHEM 1260	Chemistry Cornerstone- Ethics	1
Chemistry Electives		9
<b>Credit Hours</b>		<b>14</b>
<b>Fourth Year</b>		
<b>Semester 7</b>		
CHEM 3100	Advanced Inorganic Chemistry	4
CHEM 3115	Advanced Inorganic Chemistry Lab	1
CHEM 3060	Physical Chemistry I WE	4
CHEM 3065	Physical Chemistry I Lab	1
Chemistry Electives		3
<b>Credit Hours</b>		<b>13</b>
<b>Semester 8</b>		
CHEM 3070	Physical Chemistry II	4
CHEM 3075	Physical Chemistry II Lab	1
CHEM 3600	Biological Chemistry	3
CHEM 3605	Biological Chemistry Lab	1
CHEM 4000	Instrumental Analysis WE	2
CHEM 4005	Instrumental Analysis Laboratory	2
Chemistry Electives		4
<b>Credit Hours</b>		<b>17</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.