

Chemistry

Chemistry

The Chemistry department is in the [College of Science](#). To find the most up-to-date information, including Program Learning Outcomes for degree programs offered by the Chemistry department, visit their website.

[Chemistry department](#)

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Degrees & Programs

Chemistry, Minor

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Requirements

The minor in chemistry provides students with a broad introduction to general, organic, and analytical chemistry. The minor may be used to develop interdisciplinary and applied skills in chemistry and to learn how to communicate scientific ideals and knowledge about chemistry.

Total Program Credits: 27

Matriculation Requirements:			
1. Admitted to a bachelor degree program at UVU.			
Discipline Core Requirements:			24 Credits
	CHEM 1210	Principles of Chemistry I PP	4
	CHEM 1220	Principles of Chemistry II PP	4
	CHEM 1215	Principles of Chemistry I Laboratory	1
	CHEM 1225	Principles of Chemistry II Laboratory	1
	CHEM 2310	Organic Chemistry I	4
	CHEM 2320	Organic Chemistry II	4

	CHEM 2315	Organic Chemistry I Laboratory	1
	CHEM 2325	Organic Chemistry II Laboratory	1
	CHEM 3000	Analytical Chemistry	2
	CHEM 3005	Analytical Chemistry Laboratory	2
Elective Requirements:			3 Credits
	Any upper-division chemistry class numbered above 3000 with a minimum of 3 credit hours		3

Graduation Requirements:

1. Complete all courses with a minimum grade of "C-" or better.

Chemistry, Minor

Careers

1. Recall, integrate, and apply essential core information about the key components of chemistry
2. Qualitatively and quantitatively interpret scientific data
3. Convey scientific ideas and knowledge clearly and professionally in a written format
4. Demonstrate key laboratory skills and understanding of the laboratory safety

Related Careers

- Natural Sciences Managers
- Chemists
- Chemistry Teachers, Postsecondary
- Secondary School Teachers, Except Special and Career/Technical Education

Chemistry - Biochemistry Emphasis, B.S.

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Requirements

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.

Total Program Credits: 120

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.			
General Education Requirements:			39 Credits
	ENGL 1010	Introduction to Academic Writing CC	3
or	ENGL 1005	Literacies and Composition Across Context CC (5.0)	
	ENGL 2010	Intermediate Academic Writing CC	3
	MATH 1210	Calculus I QL	4
Complete one of the following:			3
	HIST 1700	American Civilization AS (3.0)	
	HIST 2700	US History to 1877 AS (3.0)	
and	HIST 2710	US History since 1877 AS (3.0)	

Chemistry

	HIST 1740	US Economic History AS (3.0)	
	POLS 1000	American Heritage SS (3.0)	
	POLS 1100	American National Government AS (3.0)	
Complete the following:			3
	PHIL 2050	Ethics and Values IH	
or	PHIL 205G	Ethics and Values IH GI	
or	PHIL 205H	Ethics and Values IH	
	HLTH 1100	Personal Health and Wellness TE (2.0)	
or	EXSC 1097	Fitness for Life TE	2
Distribution Courses:			
	BIOL 1610	College Biology I BB	4
	CHEM 1210	Principles of Chemistry I PP ¹	4
	CHEM 1220	Principles of Chemistry II PP ²	4
Fine Arts			3
Humanities			3
Social/Behavioral Science			3
Discipline Core Requirements:			41 Credits
	CHEM 1215	Principles of Chemistry I Laboratory ³	1
	CHEM 1225	Principles of Chemistry II Laboratory ⁴	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
Emphasis Requirements:			40 Credits
	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 (3.0)	
	CHEM 3025	Environmental Chemistry Laboratory (1.0)	
	CHEM 3300	Biomolecular Modeling and Simulations (4.0)	
	CHEM 3800	Energy Use on Earth (3.0)	
	CHEM 4030	Radiochemistry (3.0)	
	CHEM 4600	Structure Determination (3.0)	
	CHEM 4605	Structure Determination Laboratory (1.0)	
	CHEM 482R	Chemistry Internship (1-4)	
	CHEM 489R	Undergraduate Research in Chemistry (1-4)	
	CHEM 495R	Advanced Topics in Organic Chemistry (3.0)	
	CHEM 496R	Special Topics in Chemistry (1-4)	
	CHEM 499R	Independent Study and Research (1-4)	
	CHEM 4800	Pharmacology (3.0)	
Biology Electives (11 credits) from the following:			11
	BIOL 3500	Genetics (3.0)	
	BIOL 3300	Developmental Biology (3.0)	
	BIOL 3515	Advanced Genetics Laboratory (1.0)	
	BIOL 3550	Molecular Biology (3.0)	
	BIOL 4300	Bioinformatics and Genome Analysis (4.0)	
	BIOL 4550	Molecular Evolution and Bioinformatics WE (3.0)	
	BIOL 4450	Immunology (3.0)	
	BIOL 4455	Immunology Laboratory (1.0)	
	MICR 3450	General Microbiology (3.0)	
	MICR 3455	General Microbiology Laboratory (1.0)	
	ZOO 2320	Human Anatomy BB (3.0)	
and	ZOO 2325	Human Anatomy Laboratory (1.0)	
	ZOO 2420	Human Physiology (3.0)	
and	ZOO 2425	Human Physiology Laboratory (1.0)	
	ZOO 4300	Histology (4.0)	
	ZOO 4700	Advanced Anatomy (4.0)	
	ZOO 4780	Neuroscience (4.0)	

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.

- 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.
- Complete all chemistry and physics courses with a minimum grade of "C-" or better.
- Successful completion of at least one Global/Intercultural course.

Footnote:	
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
4-To be taken with	CHEM 1220 Principles of Chemistry II

Chemistry - Biochemistry Emphasis, B.S. Careers

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

Related Careers

- Natural Sciences Managers
- Chemists
- Chemistry Teachers, Postsecondary
- Secondary School Teachers, Except Special and Career/Technical Education

Chemistry - Professional Chemistry Emphasis, B.S.

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Requirements

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

Total Program Credits: 120

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.			
General Education Requirements:			40 Credits
	ENGL 1010	Introduction to Academic Writing CC	3
or	ENGH 1005	Literacies and Composition Across Context CC (5.0)	
	ENGL 2010	Intermediate Academic Writing CC	3
	MATH 1210	Calculus I QL	4
Complete one of the following:			3
	HIST 1700	American Civilization AS (3.0)	
	HIST 2700	US History to 1877 AS (3.0)	
and	HIST 2710	US History since 1877 AS (3.0)	
	HIST 1740	US Economic History AS (3.0)	
	POLS 1000	American Heritage SS (3.0)	
	POLS 1100	American National Government AS (3.0)	
Complete the following:			
	PHIL 2050	Ethics and Values IH	3
or	PHIL 205G	Ethics and Values IH GI	
or	PHIL 205H	Ethics and Values IH	
	HLTH 1100	Personal Health and Wellness TE (2.0)	
or	EXSC 1097	Fitness for Life TE	2
Distribution Courses:			
	BIOL 1610	College Biology I BB	4
	CHEM 1210	Principles of Chemistry I PP ¹	4
	CHEM 1220	Principles of Chemistry II PP ²	4
	Fine Arts		3
	Humanities		3
	Social/Behavioral Science		3
Discipline Core Requirements:			41 Credits
	CHEM 1215	Principles of Chemistry I Laboratory ³	1
	CHEM 1225	Principles of Chemistry II Laboratory ⁴	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

Chemistry

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
Emphasis Requirements:		40 Credits
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
MATH 2280	Ordinary Differential Equations	3
PHYS 3300	Mathematical Physics	3
Chemistry Electives (16 credits) from the following:		15
CHEM 3020	Environmental Chemistry (3.0)	
CHEM 3025	Environmental Chemistry Laboratory (1.0)	
CHEM 3080	Physical Chemistry III (3.0)	
CHEM 3300	Biomolecular Modeling and Simulations (4.0)	
CHEM 3620	Biological Chemistry II (3.0)	
CHEM 3800	Energy Use on Earth (3.0)	
CHEM 4030	Radiochemistry (3.0)	
CHEM 4600	Structure Determination (3.0)	
CHEM 4605	Structure Determination Laboratory (1.0)	
CHEM 4800	Pharmacology (3.0)	
CHEM 482R	Chemistry Internship (1-4)	
CHEM 489R	Undergraduate Research in Chemistry (1-4)	
CHEM 491R	Advanced Topics in Inorganic Chemistry (3.0)	
CHEM 495R	Advanced Topics in Organic Chemistry (3.0)	
CHEM 496R	Special Topics in Chemistry (1-4)	
CHEM 499R	Independent Study and Research (1-4)	
PHYS 2800	Introduction to Materials Physics (3.0)	
PHYS 3500	Thermodynamics (3.0)	
PHYS 4250	Nuclear Physics (3.0)	
PHYS 4510	Quantum Mechanics I (3.0)	
PHYS 4520	Quantum Mechanics II (3.0)	
PHYS 4800	Solid State Physics (3.0)	

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.

Footnote:

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

Chemistry - Professional Chemistry Emphasis, B.S. Careers

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.

Related Careers

- Natural Sciences Managers
- Chemists
- Chemistry Teachers, Postsecondary
- Secondary School Teachers, Except Special and Career/Technical Education

Chemistry Education, B.S.

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Requirements

The degree in chemistry education prepares a student to teach chemistry in secondary education. Students that complete this degree receive endorsements to teach chemistry. Completion of this program is dependent upon being accepted into the Secondary Education program through the School of Education. There is a great demand for teachers in chemistry and employment opportunities are excellent.

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

Total Program Credits: 120

Matriculation Requirements:		
1. Students are admitted directly to the Baccalaureate degree program in Chemistry Education upon acceptance to the Secondary Education Program.		
2. Students must obtain the departmental Advisor's signature on an approved program plan prior to enrollment in their second semester of study.		
Secondary Education Requirements:		
1. ENGL and MATH QL courses must have a grade C or higher.		
2. GPA of 3.0 or higher with no grade lower than a C in content area courses.		
3. Completion of all General Education requirements and 70% of content area courses.		
4. Pass LiveScan Criminal Background Check.		
General Education Requirements:		38 Credits
	ENGL 1010	Introduction to Academic Writing CC 3
or	ENGL 1005	Literacies and Composition Across Context CC (5.0)
	ENGL 2010	Intermediate Academic Writing CC 3
	MATH 1210	Calculus I QL 4
Complete one of the following:		3
	HIST 1700	American Civilization AS (3.0)
	HIST 2700	US History to 1877 AS (3.0)
and	HIST 2710	US History since 1877 AS (3.0)
	HIST 1740	US Economic History AS (3.0)
	POLS 1000	American Heritage AS (3.0)
	POLS 1100	American National Government AS (3.0)
Complete the following:		
	PHIL 2050	Ethics and Values IH 3
	HLTH 1100	Personal Health and Wellness TE (2.0)
or	EXSC 1097	Fitness for Life TE 2
Distribution Courses:		
	Biology 3	
	CHEM 1210	Principles of Chemistry I PP ¹ 4
	CHEM 1220	Principles of Chemistry II PP ² 4
	Humanities 3	
	Fine Arts 3	
	Social/Behavioral Science 3	
Discipline Core Requirements:		77 Credits
Chemistry Discipline Core Courses:		
	CHEM 1215	Principles of Chemistry I Laboratory ³ 1
	CHEM 1225	Principles of Chemistry II Laboratory ⁴ 1
	CHEM 1250	Chemistry Cornerstone- Research and Careers 1
	CHEM 2310	Organic Chemistry I 4
	CHEM 2320	Organic Chemistry II 4

	CHEM 2315	Organic Chemistry I Laboratory	1
	CHEM 2325	Organic Chemistry II Laboratory	1
	CHEM 3000	Analytical Chemistry	2
	CHEM 3005	Analytical Chemistry Laboratory	2
	CHEM 3060	Physical Chemistry I WE	4
	CHEM 3065	Physical Chemistry I Lab (1)	
	CHEM 3600	Biological Chemistry	3
	MATH 1220	Calculus II	4
	PHYS 2210	Physics for Scientists and Engineers I PP	4
	PHYS 2215	Physics for Scientists and Engineers I Lab	1
	PHYS 2220	Physics for Scientists and Engineers II PP	4
	PHYS 2225	Physics for Scientists and Engineers II Lab	1
	SCIE 4210	Science Teaching Methods I	3
	SCIE 4220	Teaching Methods in Science II	3
Education Discipline Core Courses: Must be completed with a B- or higher			
	EDSC 1010	Introduction to Education	2
	EDSC 3000	Educational Psychology	3
	EDSC 325G	Equitable Technology Integration GI	2
	EDSP 340G	Exceptional Students GI	2
	EDSC 4200	Classroom Management I	2
	EDSC 4250	Classroom Management II	2
	EDSC 4440	Content Area Literacies	3
	EDSC 445G	Multicultural Instruction ESL GI	3
	EDSC 455G	Secondary Curriculum Instruction and Assessment GI	3
	EDSC 4850	Student Teaching Secondary	8
	EDSC 4990	Teacher Performance Assessment Project WE	2
Chemistry Elective Requirement:			5
Complete a minimum of 5 credit hours from the following list			
	CHEM 3020	Environmental Chemistry (3)	
	CHEM 3025	Environmental Chemistry Laboratory (1)	
	CHEM 3100	Advanced Inorganic Chemistry (4)	
	CHEM 3115	Advanced Inorganic Chemistry Lab (1)	
	CHEM 3605	Biological Chemistry Lab (1)	
	CHEM 3800	Energy Use on Earth (3)	
	CHEM 4000	Instrumental Analysis WE (2)	
	CHEM 4005	Instrumental Analysis Laboratory (2)	
	CHEM 4600	Structure Determination (3)	
	CHEM 4605	Structure Determination Laboratory (1)	
	CHEM 495R	Advanced Topics in Organic Chemistry (3)	

Chemistry

CHEM 496R	Special Topics in Chemistry (1-4)	
	or advisor-approved electives	

Graduation Requirements:

1. Completion of a minimum of 120 semester credits with a minimum of 40 upper-division credits.
2. Overall Grade of 3.0 (B) or above with no grade lower than a C or better in major required content courses and no grade lower than a B- in Licensure and Methods courses.
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 52 credit hours must be in the major with a minimum of 20 credits taken at UVU. A minimum of 24 chemistry and physics credits must be upper-division.
6. Complete all chemistry courses with a minimum grade of "C-" or better.
7. Successful completion of at least one Global/Intercultural course.

Footnote:

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

Chemistry Education, B.S.

Careers

1. Demonstrate an overall knowledge of the key concepts needed to teach Chemistry at the secondary education level.
2. Demonstrate skill and knowledge in science pedagogy.
3. Develop an understanding of the interaction between chemistry and society.
4. Demonstrate the ability to communicate effectively both verbally and in writing.

Related Careers

- Chemistry Teachers, Postsecondary
- Education Teachers, Postsecondary
- Middle School Teachers, Except Special and Career/Technical Education
- Secondary School Teachers, Except Special and Career/Technical Education