UTAH VALLEY UNIVERSITY

Department of CHEMISTRY

Major Handbook

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UVU College of SCIENCE & HEALTH
UTAH VALLEY UNIVERSITY

An Introduction to Chemistry at UVU

What is Chemistry?

Chemistry is the study of matter, the material things that surround us. The field of chemistry is an excellent choice for those who are interested in any branch of science. Chemistry is often called the "central science" because principles learned in the study of chemistry are used in physics, engineering, geology, biology, environmental science, medicine, and other health sciences. They study atoms, the building blocks of matter, and how they react with each other to form compounds as well as studying the energy changes that take place in these reactions.

Why Chemistry at UVU?

The Department of Chemistry at UVU offers a Bachelor of Science degree in Chemistry with emphases in Professional Chemistry, Biochemistry, and Forensic Chemistry; a Bachelor of Science degree in Chemistry and Physics Education (in conjunction with the Departments of Physics and Secondary Education); and a Minor in Chemistry.

Bachelor of Science in Chemistry with an emphasis in Professional Chemistry

The emphasis in Professional Chemistry prepares a student for employment as a chemist or further study in a graduate degree or professional program. This degree is designed to meet American Chemical Society standards for a bachelor degree. Graduates in this area may have careers in test laboratories, government laboratories, hospital laboratories, research and development, quality control, manufacturing, and many other areas.

Bachelor of Science in Chemistry with an emphasis in Biochemistry

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.

Bachelor of Science in Chemistry with an emphasis in Forensic Chemistry

The Forensic Chemistry emphasis prepares a student for work in a forensic laboratory. A forensic chemist is a professional chemist who analyzes evidence that is brought in from crime scenes and reaches a conclusion based on tests run on that piece of evidence.

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College of Science and Health
Department of Chemistry

B.S. in Chemistry

- **CHEM 1210 or Department Chair approval** is required for matriculation into this program
- A minimum of 124 credits are required to graduate
- An minimum grade of "C-" or better is required in all chemistry and physics courses
- An overall GPA of at least 2.0 is required; a 2.25 GPA is required in core courses

General Education Requirements

Course Pref/Num	Course Title	Cr	Prerequistites
ENGL 1010	Introduction to Writing	3	Placement or ENGH 0990 w/C- or better
ENGL 2020	Intermediate Writing: Science/Tech	3	ENGL 1010 w/C- or better
MATH 1210	**Calculus I**	5	MATH 1050/1060 w/C or better, or placement

*Complete **one** of the following options:*

HIST 2700 and 2710	US History to 1877 and since 1877	3/3	
HIST 1700	American Civilization	3	
ECON 1740	US Economic History	3	
POLS 1000	American Heritage	3	
POLS 1100	American Government	3	

Complete the following:

PHIL 2050 or 205G	Ethics and Values	3	ENGL 1010

*Complete **one** of the following:*

HLTH 1100 or PES 1097	Personal Health and Wellness or Fitness for Life	2	

*Distribution courses: complete **one** course from **each** category below*

Biology	See distribution list on last page **(BIOL 1610 for Biochemistry and Forensic emphasis)**		
Physical Science*	**CHEM 1210/1215 (Principles of Chemistry I/lab)**	4/1	MATH 1050
Biology or Phys Sci*	**CHEM 1220/1225 (Principles of Chemistry II/lab)**	4/1	CHEM 1210/1215
Humanities	See distribution list **(COMM 1020 for Forensic Emphasis)**	3	
Fine Arts	See distribution list	3	
Social/Behav Sci	See distribution list **(CJ 1010 for Forensic Emphasis)**	3	

*bolded courses indicate the specific courses that must be taken for this degree that will also fulfill those particular distribution GE requirements

Global Intercultural course*	See distribution list	3	

*Students completing a BS/BA following the 2008 or later catalog must complete one course that meets this GI requirement, indicated by a course number ending in 'G.' A list of courses that fulfill this requirement is available on the last page of this handout. Keep in mind that **PHIL 205G** (Ethics and Values) will fulfill this and the PHIL 2050 requirement above.*

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Chemistry majors are required to complete the Discipline Core requirements as well as the requirements for their chosen emphasis.

Discipline Core Requirements (41 credits)

Complete each of the following courses:

Prefix/#	Course Title	Cr	Prerequisites	Corequisite	Sem
CHEM 2310	Organic Chemistry I	4	CHEM 1210, 1220		F, Sp, Su
CHEM 2315	Organic Chemistry I lab	1		CHEM 2310	F, Sp, Su
CHEM 2320	Organic Chemistry II	4	CHEM 2310		F, Sp, Su
CHEM 2325	Organic Chemistry II lab	1	CHEM 2315	CHEM 2320	F, Sp, Su
CHEM 3000	Analytical Chemistry	2	CHEM 2320	CHEM 3005	F
CHEM 3005	Analytical Chemistry lab	2	CHEM 2325	CHEM 3000	F
CHEM 3100	Advanced Inorganic Chemistry	4	CHEM 3000 recommended		Sp
CHEM 3200	Chemistry Literature	1	CHEM 2320	CHEM 3000	F
CHEM 3600	Biological Chemistry	3	CHEM 2320		F, Sp, Su
CHEM 3605	Biological Chemistry lab	1		CHEM 3600	F, Sp
CHEM 4000	Instrumental Analysis	2	CHEM 3000, 3070	CHEM 3115	Sp
CHEM 4005	Instrumental Analysis lab	2	CHEM 3000, 2325	CHEM 4000	Sp
CHEM 490R	Chemistry Seminar	.5 X 4	CHEM 2320		F, Sp
MATH 1220	Calculus II	5	MATH 1210 w/ C or better		F, Sp, Su
PHYS 2210	Physics for Scientists and Engineers I	4	MATH 1210	PHYS 2215	F, Sp, Su
PHYS 2215	Physics for Scientists and Engineers I lab	1		PHYS 2210	F, Sp, Su
PHYS 2220	Physics for Scientists and Engineers II	4	PHYS 2210, MATH 1220	PHYS 2225	F, Sp, Su
PHYS 2225	Physics for Scientist and Engineers II lab	1		PHYS 2220	F, Sp, Su

Professional Chemistry Emphasis Requirements (36 credits)

Complete each of the following courses:

Prefix/#	Course Title	Cr	Prerequisites	Corequisite	Sem
CHEM 3060	Physical Chemistry I	4	PHYS 2220, MATH 2210		F
CHEM 3070	Physical Chemistry II	4	CHEM 3060		Sp
CHEM 3115	Physical and Inorganic Chemistry Lab	1	CHEM 3000, 3060	CHEM 3100, 3070	Sp
MATH 2210	Calculus III	3	MATH 1220 w/C or better		F, Sp, Su
MATH 2280	Ordinary Differential Equations	3	MATH 2210 w/C or better		F, Sp
PHYS 3300	Mathematical Physics	3	MATH 2210	MATH 2280 or permission	F

Complete 12 credits of upper-division CHEM courses not previously taken, with the exception of CHEM 3090. With departmental approval, up to 6 cr of upper-div courses in BIOL, GEO, MATH, or PHYS may be substituted.

Professional Chemistry Emphasis Elective Requirements (6 credits)

Complete 6 elective credits in any courses 1000 or higher

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Biochemistry Emphasis Requirements (16 credits)

Complete each of the following courses:

Prefix/#	Course Title	Cr	Prerequisites	Corequisites	Sem
BIOL 1615	College Biology lab	1		BIOL 1610	F, Sp
BIOL 1620	College Biology II	3	BIOL 1610	BIOL 1625	F, Sp, Su
BIOL 1625	College Biology II Lab	1		BIOL 1620	F, Sp, Su
BIOL 3400	Cell Biology	3	BIOL 1610 and CHEM 1220		F, Sp, Su
BIOL 3405	Cell Biology Lab	1	BIOL 1610 and CHEM 1220	BIOL 3400	F, Sp
CHEM 3090	Physical Chem Applications in Biology	3	MATH 1220, CHEM 2320		Sp
CHEM 3620	Biochemistry II	3	CHEM 3600		Sp

Biochemistry Emphasis Elective Requirements - Chemistry (3 credits)

Complete 3 credits of any upper-division CHEM course not previously taken, with the exception of CHEM 3060 or CHEM 3070.

Biochemistry Emphasis Elective Requirements (17 credits)

Complete 17 credits from the following:

Prefix/#	Course Title	Cr	Prerequisites	Corequisites	Sem
BIOL 3300	Developmental Biology	3	BIOL 1620		
BIOL 3500	Genetics	3	BIOL 1610		F, Sp
BIOL 3515	Advanced Genetics Lab	1	BIOL 3500 (or coreq)		
BIOL 3550	Molecular Biology	3	BIOL 1620 and CHEM 1215		
BIOL 4300	Bioinformatics and Genome Analysis	4	BIOL 1610, BIOL 3400		
BIOL 4450	Immunology	3	MICR 2060 or 3450 or ZOOL 2420	BIOL 4455	Sp
BIOL 4455	Immunology Lab	1		BIOL 4450	Sp
MICR 3450	General Microbiology	3	BIOL 3400	MICR 3455	F, Sp
MICR 3455	General Microbiology Lab	1	BIOL 3400	MICR 3450	F, Sp
ZOOL 2320	Human Anatomy	3	BIOL 1610 and ENGL 1010	ZOOL 2325	F, Sp, Su
ZOOL 2325	Human Anatomy Lab	1	BIOL 1610 and ENGL 1010	ZOOL 2320	F, Sp, Su
ZOOL 2420	Human Physiology	3	BIOL 1610 and CHEM 1210	ZOOL 2425	F, Sp, Su
ZOOL 2425	Human Physiology Lab	1	BIOL 1610 and CHEM 1210	ZOOL 2420	F, Sp, Su
ZOOL 4300	Histology	4	ZOOL 2320 or permission		
ZOOL 4700	Advanced Anatomy	4	ZOOL 2320		F, Sp
ZOOL 4780	Neuroscience	4	ZOOL 2420		F

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Forensic Chemistry Emphasis Requirements (32 credits)

Complete each of the following courses:

Prefix/#	Course Title	Cr	Prerequisites	Corequisites	Sem
BIOL 1615	College Biology lab	1		BIOL 1610	F, Sp
CHEM 3090	Physical Chem Applications in Biology	3	MATH 1220, CHEM 2320		Sp
CHEM 3700	Forensic Analytical Chemistry	3	CHEM 3000, 2320	CHEM 4000, 4005	OSD
MATH 2040	Principles of Statistics	4	MATH 1050 with C or better		F, Sp, Su

Forensic requirements – *complete each of the following courses:*

CHEM 482R	Chemistry Internship	3	CHEM 2320, 3200, Dept approval, 3.0 GPA		F, Sp, Su
CJ 1330	Criminal Law	3	CJ 1010		F, Sp, Su
CJ 1340	Criminal Investigations	3	CJ 1010 and ENGL 1010		F, Sp
CJ 1350	Intro to Forensic Science	3	CJ 1010		F, Sp
CJ 2350	Laws of Evidence	3	CJ 1330		F, Sp
FSCI 3880	Prof Practices for the Forensic Scientist	3	CJ 1330, 2350 each with C+ or better		

Complete **one** of the following:

BIOL 2500	Environmental Biology	3	DRP of 85; BIOL 1010 or 1610 recommended		F, Sp
MICR 2060 and MICR 2065	Microbiology for Health Professions and Microbiology for Health Professions lab	3 1	BIOL 1010 or 1610, ENGL 1010		F, Sp, Su
ZOOL 2320/25	Human Anatomy	4	BIOL 1010 or 1610, ENGL 1010 or test scores		F, Sp, Su
ZOOL 2420/25	Human Physiology	4	BIOL 1010 or 1610, CHEM 1110		F, Sp, Su

Forensic Chemistry Emphasis Elective Requirements (9 credits)

Complete 9 credits from the following:

Prefix/#	Course Title	Cr	Prerequisites	Corequisites	Sem
BIOL 3400	Cell Biology	3	BIOL 1610 and CHEM 1220		F, Sp
BIOL 3500	Genetics	3	BIOL 1610		F, Sp
BIOL 3550	Molecular Biology	3	BIOL 1620 and CHEM 1215		Sp
BIOL 4450	Immunology	3	MICR 2060 or 3450 or ZOOL 2420	BIOL 4455	Sp
GEO 3400	Forensic Geology	4	CHEM 1210, 1215	CHEM 1220, 1225 recomm	
FSCI 3500	Footwear Impression Evidence	3	CJ 1350		Sp
FSCI 3520	Tire Imprint Evidence	3	CJ 135L, 1350 with C+ or better		Sp
FSCI 3540	Forensic Trace Analysis I	3	CJ 135L with C+ or better		Sp
FSCI 3550	Forensic Trace Analysis II	3	CJ 135L with C+ or better		
FSCI 3700	Fingerprint Examination I	3	CJ 135L with C+ or better		F, Su
FSCI 3720	Fingerprint Examination II	3	CJ 135L, 3700 with C+ or better		Sp
FSCI 3740	Fingerprint Examination III	3	Instructor's consent		
FSCI 3780	Bloodstain Pattern Analysis	3	CJ 135L with C+ or better		
FSCI 3820	Crime Scene Investigation Techniques I	3	CJ 1340		F, Sp
FSCI 382L	Crime Scene Investigation Techniques Lab I	1	CJ 1340	CJ 3820	F, Sp,
FSCI 3850	Marijuana Identification Certificate	3	CJ 135L with C+ or better or permission		
FSCI 3860	Forensic Microscopy	3	CJ 135L with C+ or better		F
FSCI 4400	Forensic Chemist	3	CJ 135L, 3820, 3880 w/C+ or better, and CHEM 2320	CJ 440L	Sp