

# Chemistry, BS

## Program Description

The Bachelor of Science in Chemistry provides students the opportunity to study chemistry at in-depth levels necessary to prepare them for future careers in many scientific fields. Chemistry is often referred to as the “central science” due to its fundamentals that apply to many disciplines across the STEM areas. The chemistry program at Utah Tech University prepares students for careers in chemistry, engineering, medicine, health sciences, environmental science, law and policy, and materials science. In particular, detailed knowledge is gained through curricula that cover the sub-disciplines of chemistry and how they integrate into the modern cross-disciplinary landscape of science.

## Program Curriculum

**120 credits**

### Utah Tech General Education Requirements

All Utah Tech General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to Utah Tech's minimum General Education standards in American Institutions, English, and Mathematics.

General Education Core Requirements (<https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext>)

Code	Title	Hours
English		3-7
Mathematics		3-5
American Institutions		3-6
Life Sciences		3-10
Physical Sciences		3-5
Fine Arts		3
Literature/Humanities		3
Social & Behavioral Sciences		3

### Chemistry Program Requirements

Code	Title	Hours
MATH 1210	Calculus I (MA)	4
MATH 1220	Calculus II (MA)	4
BIOL 1610 & BIOL 1615	Principles of Biology I (LS) and Principles of Biology I Lab (LAB)	5
PHYS 2210 & PHYS 2215	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab	5
PHYS 2220 & PHYS 2225	Physics/Scientists EngineersII and Physics/Scientists Engineers II Lab	5
<b>Choose one (1) of the following courses</b>		
MATH 2210	Multivariable Calculus (MA)	4
MATH 2250	Differential Equations and Linear Algebra	4
MATH 2270	Linear Algebra	3
MATH 2280	Ordinary Differential Equations	3
MATH 3060	Statistics for Scientists	3

## Chemistry Core Requirements

Code	Title	Hours
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
CHEM 1220 & CHEM 1225	Principles of Chemistry II and Principles of Chemistry II Lab	5
CHEM 2310 & CHEM 2315	Organic Chemistry I and Organic Chemistry I Lab	5
CHEM 2320 & CHEM 2325	Organic Chemistry II and Organic Chemistry II Lab	5
CHEM 2600	Laboratory Safety and Practices	1
CHEM 2990R	Chemistry Seminar and Professional Development	1
CHEM 3000 & CHEM 3005	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory	4
CHEM 3060 & CHEM 3065	Physical Chemistry 1 and Physical Chemistry I Lab	5
CHEM 3070 & CHEM 3075	Physical Chemistry II and Physical Chemistry II Lab	5
CHEM 3100	Inorganic Chemistry	4
CHEM 3300	Instrumental Analysis	4
CHEM 3510 & CHEM 3515	Biochemistry I and Biochemistry I Lab	4
CHEM 3520 & CHEM 3525	Biochemistry II and Biochemistry II Lab	4
CHEM 4100	Advanced Inorganic Chemistry	3
CHEM 4800R	Independent Research (Minimum 2 credits)	1-3
CHEM 4910	Chemistry Senior Seminar	1

## Chemistry Elective Courses

Code	Title	Hours
Complete two (2) courses from the following:		
CHEM 4200	Environmental Chemistry	3
CHEM 4310	Adv Organic Chemistry I	3
CHEM 4510	Chemistry of Materials	3
CHEM 4610	Nutritional Biochemistry	3

## Graduation Requirements

1. Complete a minimum of 120 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at Utah Tech for institutional residency.
4. Cumulative GPA 2.0 or higher.
5. Grade C or higher in each Core Discipline, Research Area, and Chemistry Elective course.

## Graduation Plan - Odd Year Start

1st Year		Hours
Fall Semester	Hours Spring Semester	Hours
CHEM 1210 & CHEM 1215	5 CHEM 1220 & CHEM 1225	5
ENGL 1010	3 ENGL 2010	3
MATH 1210	4 MATH 1220	4

General Education (Fine Arts) ( <a href="https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )	3 General Education (American Institutions) ( <a href="https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )	3
Trailblazer Connections	2	

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**17** **15**

**2nd Year**

<b>Fall Semester</b>	<b>Hours</b>	<b>Spring Semester</b>	<b>Hours</b>
CHEM 2310 & CHEM 2315		5 CHEM 2320 & CHEM 2325	5
BIOL 1610 & BIOL 1615		5 MATH 2210 <sup>1</sup>	4
PHYS 2210 & PHYS 2215		5 PHYS 2220 & PHYS 2225	5
		General Education (Literature/ Humanities) ( <a href="https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )	3

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**15** **17**

**3rd Year**

<b>Fall Semester</b>	<b>Hours</b>	<b>Spring Semester</b>	<b>Hours</b>
CHEM 2990R		1 CHEM 3070 & CHEM 3075	5
CHEM 3060 & CHEM 3065		5 CHEM 3520 & CHEM 3525	4
CHEM 3510 & CHEM 3515		4 CHEM 4800R	1
General Education (Social and Behavioral Science) ( <a href="https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )		3 Elective Course	3
CHEM Elective	3		

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**16** **13**

**4th Year**

<b>Fall Semester</b>	<b>Hours</b>	<b>Spring Semester</b>	<b>Hours</b>
CHEM 3000 & CHEM 3005		4 CHEM 3300	4
CHEM 3100		4 CHEM 4100	3
CHEM Elective		3 CHEM 4910	1
CHEM 2600		1 CHEM Elective	3
CHEM 4800R		1 Elective Course	3

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**13** **14**

**Total Hours 120**

<sup>1</sup> or MATH 2250 or MATH 2270 or MATH 2280 or MATH 3060

## Graduation Plan - Even Year Start

### 1st Year

Fall Semester	Hours Spring Semester	Hours
CHEM 1210 & CHEM 1215	5 CHEM 1220 & CHEM 1225	5
MATH 1210	4 MATH 1220	4
ENGL 1010	3 ENGL 2010	3
General Education (Fine Arts) ( <a href="https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )	3 General Education (Social & Behavioral) ( <a href="https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )	3
Trailblazer Connections	2	
	<b>17</b>	<b>15</b>

### 2nd Year

Fall Semester	Hours Spring Semester	Hours
CHEM 2310 & CHEM 2315	5 CHEM 2320 & CHEM 2325	5
BIOL 1610 & BIOL 1615	5 MATH 2210 <sup>1</sup>	4
PHYS 2210 & PHYS 2215	5 PHYS 2220 & PHYS 2225	5
	General Education (American Institutions) ( <a href="https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )	3
	<b>15</b>	<b>17</b>

### 3rd Year

Fall Semester	Hours Spring Semester	Hours
CHEM 2990R	1 CHEM 3300	4
CHEM 3000 & CHEM 3005	4 CHEM 4100	3
CHEM 3100	4 CHEM 4800R	1
CHEM 2600	1 CHEM Elective	3
CHEM Elective	3 Elective Course	3
	<b>13</b>	<b>14</b>

### 4th Year

Fall Semester	Hours Spring Semester	Hours
CHEM 3060 & CHEM 3065	5 CHEM 3070 & CHEM 3075	5
CHEM 3510 & CHEM 3515	4 CHEM 3520 & CHEM 3525	4
CHEM 4800R	1 CHEM 4910	1
General Education (Literature / Humanities) ( <a href="https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext">https://catalog.utahtech.edu/programs/generaleducation/#gerequirementstext</a> )	3 Elective Course	3
CHEM Elective	3	
	<b>16</b>	<b>13</b>

**Total Hours 120**

<sup>1</sup> or MATH 2250 or MATH 2270 or MATH 2280 or MATH 3060

### **BS Chemistry Program Learning Outcomes**

At the successful conclusion of this program, students will be able to:

1. Assess and critique local and global issues based on acquired knowledge in chemistry to formulate solutions to problems.
2. Integrate knowledge of basic fundamental laws, concepts, and theories to apply them to everyday life.
3. Consider the process of science — how scientific knowledge is generated and validated — to make independent, empirical inquiries about the chemical world.
4. Evaluate, interpret, and communicate data in the form of tables, graphs, and charts in oral and or written form.
5. Analyze original data through research or internship and present findings in a professional setting.