

# BACHELOR OF SCIENCE IN CHEMISTRY (AMERICAN CHEMICAL SOCIETY CERTIFICATION)

**Web Site:** <https://twu.edu/chemistry-biochemistry/undergraduate-programs/bs-in-chemistry-with-an-acscertification/>

The ACS plan, approved by the American Chemical Society, is the most comprehensive offered by the department. Students who complete this degree program will receive ACS professional certification. This program is recommended for those contemplating careers in the chemical industry or for those working toward advanced degrees in chemistry.

## Marketable Skills

Defined by the Texas Higher Education Coordinating Board's 60x30 Strategic Plan (<https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/the60x30-strategic-plan/>) as, "Those skills valued by employers that can be applied in a variety of work settings, including interpersonal, cognitive, and applied skills areas. These skills can be either primary or complementary to a major and are acquired by students through education, including curricular, co-curricular, and extracurricular activities."

1. As a member of an undergraduate teaching lab team and research team, you will learn how to work and communicate with diverse team members.
2. By writing laboratory reports, papers, senior theses coupled with presenting your work to your peers, at conferences, or to the general public, you will gain valuable verbal and written communication skills.
3. With our departmental focus on civic engagement and laboratory safety as our first priority, you will understand social and personal responsibility.
4. Finally, since earning a degree in any field of chemistry naturally requires excellent problem solving and critical thinking skills related to chemistry, these skills can also be used to address other issues and solve other problems.

## Admissions

All applicants must meet the general undergraduate admission requirements (<https://catalog.twu.edu/undergraduate/admission-information/>).

## Degree Requirements

**Total Semester Credit Hours (SCH):** 124

**Major:** 55 SCH

**Program Code:** CHEMISTRY.BS.ACS; **CIP Code:** 40.0501.00

### Texas Core Curriculum

Code	Title	SCHs
ENG 1013	Composition I	3
ENG 1023	Composition II	3
Mathematics		3
Life & Physical Sciences		6

Language, Philosophy, & Culture		3
Creative Arts		3
HIST 1013	History of the United States, 1492-1865	3
HIST 1023	History of the United States, 1865 to the Present	3
POLS 2013	U.S. National Government	3
POLS 2023	Texas Government	3
Social & Behavioral Sciences		3
CAO: Women's Studies		3
CAO: First Year Seminar, Wellness or Mathematics		3
<b>Total SCHs</b>		<b>42</b>

### Courses Required for Major

Code	Title	SCHs
CHEM 1001	Horizons of Chemistry and Biochemistry I: Career Possibilities	1
CHEM 1101	Horizons of Chemistry and Biochemistry II: Current Applications	1
CHEM 1213 & CHEM 1211	Principles of Chemistry I and Principles of Chemistry Laboratory I	4
CHEM 1223 & CHEM 1221	Principles of Chemistry II and Principles of Chemistry Laboratory II	4
CHEM 2213 & CHEM 2211	Organic Chemistry I and Organic Chemistry Laboratory I	4
CHEM 3223 & CHEM 3221	Organic Chemistry II and Organic Chemistry Laboratory II	4
CHEM 3333 & CHEM 3331	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory	4
CHEM 3413 & CHEM 3411	Physical Chemistry I and Physical Chemistry Laboratory I	4
CHEM 3423 & CHEM 3421	Physical Chemistry II and Physical Chemistry Laboratory II	4
CHEM 3633 & CHEM 3632	Biochemistry I and Biochemistry I Laboratory	5
CHEM 3643	Biochemistry II	3
CHEM 4001	Research Presentations in Chemistry and Biochemistry	1
CHEM 4313 & CHEM 4311	Instrumental Analysis and Instrumental Analysis Laboratory	4
CHEM 4513 & CHEM 4511	Inorganic Chemistry and Inorganic Chemistry Laboratory	4
CHEM 4983	Undergraduate Research	3
CHEM 4991	Senior Thesis	1
CHEM 3713 & CHEM 3711	Environmental Chemistry I and Environmental Chemistry Laboratory I	4
<b>Total SCHs</b>		<b>55</b>

### Departmental Requirements

Code	Title	SCHs
MATH 2014	Calculus I (may be applied from core)	4
MATH 2024	Calculus II	4
PHYS 2153 & PHYS 2151	General Physics I and General Physics Laboratory I (may be applied from core)	4

PHYS 2163 & PHYS 2161	General Physics II and General Physics Laboratory II (may be applied from core)	4
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**Total SCHs** 16

## Electives

Code	Title	SCHs
Choose 11 SCH not already taken		11

CHEM 4983	Undergraduate Research	
CHEM 4913	Independent Study	
MATH 3063	Linear Algebra	
MATH 3073	Matrix Methods	
MATH 3104	Calculus III	
MATH 3123	Differential Equations	
MATH 4013	Probability and Statistics	
BIOL 1113 & BIOL 1111	Principles of Biology I and Principles of Biology I Laboratory	
BIOL 1123 & BIOL 1121	Principles of Biology II and Principles of Biology II Laboratory	
BIOL 4223 & BIOL 4221	Ecology and Ecology Laboratory	
BIOL 4813 & BIOL 4811	Molecular and Cellular Biology: Gene Expression and Molecular and Cellular Biology: Gene Expression Laboratory	
BIOL 4823 & BIOL 4821	Molecular and Cellular Biology: Genetics and Inheritance and Molecular and Cellular Biology: Genetics and Inheritance Laboratory	

**Total SCHs** 11

## Recommended Plan of Study

### First Year

Fall	TCCN	SCHs
CHEM 1001 Horizons of Chemistry and Biochemistry I: Career Possibilities		1
CHEM 1213 Principles of Chemistry I & CHEM 1211 and Principles of Chemistry Laboratory I		4
MATH 2014 Calculus I	MATH 2413	4
UNIV 1231 Learning Frameworks: the First-Year Seminar	EDUC 1100, EDUC 1200, EDUC 1300	1
Wellness CAO Core		2
ENG 1013 Composition I	ENGL 1301	3
<b>SCHs</b>		<b>15</b>

Spring	TCCN	SCHs
CHEM 1101 Horizons of Chemistry and Biochemistry II: Current Applications		1
CHEM 1223 Principles of Chemistry II & CHEM 1221 and Principles of Chemistry Laboratory II		4
MATH 2024 Calculus II	MATH 2414	4
Multicultural Women's Studies CAO Core		3

ENG 1023 Composition II	ENGL 1302	3
<b>SCHs</b>		<b>15</b>

### Second Year

Fall	TCCN	SCHs
CHEM 2213 Organic Chemistry I & CHEM 2211 and Organic Chemistry Laboratory I	CHEM 2323 & CHEM 2123	4
PHYS 2153 General Physics I & PHYS 2151 and General Physics Laboratory I	PHYS 2325 & PHYS 2125	4
POLS 2013 U.S. National Government Language, Philosophy, and Culture	GOVT 2305	3
<b>SCHs</b>		<b>14</b>

Spring	TCCN	SCHs
CHEM 3223 Organic Chemistry II & CHEM 3221 and Organic Chemistry Laboratory II		4
PHYS 2163 General Physics II & PHYS 2161 and General Physics Laboratory II	PHYS 2326 & PHYS 2126	4
POLS 2023 Texas Government	GOVT 2306	3
CHEM 3333 Quantitative Chemical Analysis & CHEM 3331 and Quantitative Chemical Analysis Laboratory		4
<b>SCHs</b>		<b>15</b>

### Third Year

Fall	TCCN	SCHs
CHEM 3413 Physical Chemistry I & CHEM 3411 and Physical Chemistry Laboratory I		4
CHEM 3633 Biochemistry I & CHEM 3632 and Biochemistry I Laboratory		5
Social & Behavioral Science		3
CHEM 4313 Instrumental Analysis & CHEM 4311 and Instrumental Analysis Laboratory		4
<b>SCHs</b>		<b>16</b>

Spring	TCCN	SCHs
CHEM 3423 Physical Chemistry II & CHEM 3421 and Physical Chemistry Laboratory II		4
CHEM 3643 Biochemistry II Elective (Global Perspectives course)		3
CHEM 4001 Research Presentations in Chemistry and Biochemistry		1
Elective		3
CHEM 3713 Environmental Chemistry I & CHEM 3711 and Environmental Chemistry Laboratory I		4
<b>SCHs</b>		<b>18</b>

### Fourth Year

Fall	TCCN	SCHs
CHEM 4983 Undergraduate Research		3
CHEM 4513 Inorganic Chemistry & CHEM 4511 and Inorganic Chemistry Laboratory		4
Creative Arts Core		3
Elective		4

HIST 1013	History of the United States, 1492-1865	HIST 1301	3
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	<b>SCHs</b>		<b>17</b>
<b>Spring</b>		<b>TCCN</b>	
CHEM 4991	Senior Thesis		1
Elective			3
HIST 1023	History of the United States, 1865 to the Present	HIST 1302	3
Elective			4
Elective			3
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	<b>SCHs</b>		<b>14</b>
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	<b>Total SCHs:</b>		<b>124</b>