

# BACHELOR OF SCIENCE IN BIOCHEMISTRY (PRE-HEALTH MAJORS)

**Web Site:** <https://twu.edu/chemistry-biochemistry/undergraduate-programs/bs-in-biochemistry-for-pre-health-majors/>

This degree prepares students for graduate work in biochemistry, for careers in the chemical/pharmaceutical industries, and is ideal for admission to medically-related professional programs. This degree offers flexibility for students in the upper-division courses so they can tailor their program to their individual professional goals. For those more interested in medically related programs, students would choose upper-division biology courses, whereas those more interested in graduate work in biochemistry would choose upper-division chemistry courses.

## Marketable Skills

Defined by the Texas Higher Education Coordinating Board's 60x30 Strategic Plan (<https://reportcenter.highered.texas.gov/agency-publication/miscellaneous/thecb-60x30-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."

- As a member of an undergraduate teaching lab team and research team, you will learn how to work and communicate with diverse team members.
- 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.
- With our departmental focus on civic engagement and laboratory safety as our first priority, you will understand social and personal responsibility.
- 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 (<http://catalog.twu.edu/undergraduate/admission-information/>).

## Degree Requirements

**Total Semester Credit Hours (SCH):** 120

**Major:** 34 SCH

**Program Code:** BIOCHEMISTRY.BS.HLTH; **CIP Code:** 26.0202.00

### 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 3313	Physical Chemistry for the Life Sciences	3
CHEM 3633 & CHEM 3632	Biochemistry I and Biochemistry I Laboratory	5
CHEM 3333 & CHEM 3331	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory	4
CHEM 3643	Biochemistry II	3
CHEM 4001	Research Presentations in Chemistry and Biochemistry	1
<b>Total SCHs</b>		<b>34</b>

### Departmental Requirements

Code	Title	SCHs
MATH 2014	Calculus I	4
MATH 2024	Calculus II	4
BIOL 1113 & BIOL 1111	Principles of Biology I and Principles of Biology I Laboratory	4
BIOL 1123 & BIOL 1121	Principles of Biology II and Principles of Biology II Laboratory	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
Choose one of the following		4
BIOL 4223 & BIOL 4221	Ecology and Ecology Laboratory	

BIOL 4823 & BIOL 4821	Molecular and Cellular Biology: Genetics and Inheritance and Molecular and Cellular Biology: Genetics and Inheritance Laboratory		
BIOL 4813 & BIOL 4811	Molecular and Cellular Biology: Gene Expression and Molecular and Cellular Biology: Gene Expression Laboratory		
BACT 3113 & BACT 3111	General Microbiology and General Microbiology Laboratory		
ZOOL 4243 & ZOOL 4241	Medical Physiology and Medical Physiology Laboratory		
<b>Total SCHs</b>		<b>28</b>	

## Electives

Code	Title	SCHs
<b>Choose 16-17 SCH not already taken</b>		
Global Perspectives Course (see advisor for selection)		
CHEM 3413 & CHEM 3411	Physical Chemistry I and Physical Chemistry Laboratory I	
CHEM 3423 & CHEM 3421	Physical Chemistry II and Physical Chemistry Laboratory II	
CHEM 4983	Undergraduate Research	
CHEM 4313 & CHEM 4311	Instrumental Analysis and Instrumental Analysis Laboratory	
CHEM 4513 & CHEM 4511	Inorganic Chemistry and Inorganic Chemistry Laboratory	
CHEM 4913	Independent Study	
BIOL 4223 & BIOL 4221	Ecology and Ecology Laboratory	
BIOL 4823 & BIOL 4821	Molecular and Cellular Biology: Genetics and Inheritance and Molecular and Cellular Biology: Genetics and Inheritance Laboratory	
BIOL 4813 & BIOL 4811	Molecular and Cellular Biology: Gene Expression and Molecular and Cellular Biology: Gene Expression Laboratory	
BACT 3113 & BACT 3111	General Microbiology and General Microbiology Laboratory	
ZOOL 4243 & ZOOL 4241	Medical Physiology and Medical Physiology Laboratory	
CHEM 3713 & CHEM 3711	Environmental Chemistry I and Environmental Chemistry Laboratory I	
<b>Total SCHs</b>		<b>16-17</b>

## Recommended Plan of Study

### First Year

Fall	TCCN	SCHs
CHEM 1001	Horizons of Chemistry and Biochemistry I: Career Possibilities	1
CHEM 1213 & CHEM 1211	Principles of Chemistry I and Principles of Chemistry Laboratory I	4
MATH 2014	Calculus I	MATH 2413 4

BIOL 1113 & BIOL 1111	Principles of Biology I and Principles of Biology I Laboratory	BIOL 1406 & BIOL 1106	4
UNIV 1231	Learning Frameworks: The First Year Experience	EDUC 1100, EDUC 1200, EDUC 1300	1
Wellness/Math CAO Core			2

**SCHs 16**

Spring	TCCN		
CHEM 1101	Horizons of Chemistry and Biochemistry II: Current Applications	1	
CHEM 1223 & CHEM 1221	Principles of Chemistry II and Principles of Chemistry Laboratory II	4	
MATH 2024 or 4013	Calculus II or Probability and Statistics	MATH 2414 4	
BIOL 1123 & BIOL 1121	Principles of Biology II and Principles of Biology II Laboratory	BIOL 1407 & BIOL 1107 4	
Multicultural Women's Studies CAO Core			3

**SCHs 16**

Second Year	Fall	TCCN
CHEM 2213 & CHEM 2211	Organic Chemistry I and Organic Chemistry Laboratory I	CHEM 2323 & CHEM 2123 4
PHYS 2153 & PHYS 2151	General Physics I and General Physics Laboratory I	PHYS 2325 & PHYS 2125 4
HIST 1013	History of the United States, 1492-1865	HIST 1301 3
ENG 1013	Composition I	ENGL 1301 3

**SCHs 14**

Spring	TCCN	
CHEM 3223 & CHEM 3221	Organic Chemistry II and Organic Chemistry Laboratory II	4
PHYS 2163 & PHYS 2161	General Physics II and General Physics Laboratory II	PHYS 2326 & PHYS 2126 4
ENG 1023	Composition II	ENGL 1302 3
CHEM 3333 & CHEM 3331	Quantitative Chemical Analysis and Quantitative Chemical Analysis Laboratory	4

**SCHs 15**

Third Year	Fall	TCCN	
CHEM 3633 & CHEM 3632	Biochemistry I and Biochemistry I Laboratory	5	
BIOL 3XXX or 4XXX		4	
POLS 2013	U.S. National Government Elective	GOVT 2305 3	
Wellness/Math CAO Core			4

**SCHs 16**

Spring	TCCN	
CHEM 3313	Physical Chemistry for the Life Sciences	3
CHEM 3643	Biochemistry II	3
CHEM 4983	Undergraduate Research	3

Elective (Global Perspectives course)		3	
POLS 2023	Texas Government	GOVT 2306	3
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<b>SCHs</b>		<b>15</b>	
<b>Fourth Year</b>			
<b>Fall</b>		<b>TCCN</b>	
Elective		3	
CHEM 4983	Undergraduate Research	3	
Creative Arts Core		3	
Language, Philosophy, and Culture Core		3	
Elective		2	
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<b>SCHs</b>		<b>14</b>	
<b>Spring</b>		<b>TCCN</b>	
CHEM 4001	Research Presentations in Chemistry and Biochemistry	1	
HIST 1023	History of the United States, 1865 to the Present	HIST 1302	3
Elective - Upper Level		4	
Elective		3	
Social & Behavioral Science Core		3	
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<b>SCHs</b>		<b>14</b>	
<b>Total SCHs:</b>		<b>120</b>	