

BS in Biochemistry

There are a wide range of career options for chemists and biochemists in a diverse array of occupational fields. Opportunities can be divided into five main sectors: Industry, Academia, Government, Non-Profit, and Entrepreneurship. In addition, the programs of study for both chemistry and biochemistry degrees provide strong academic, critical thinking, and foundational skills for students interested in pursuing advanced professional degrees in medicine, dentistry, veterinary medicine, and pharmacy, as well as rigorous preparation for graduate school.

The curriculum requirement to obtain a BS in Biochemistry consists of the general College of Science curriculum requirements.

Marketable Skills

Students develop the following marketable skills:

- Communication: Reach mutual understanding through the effective exchange of information, ideas, and feelings
- Critical thinking: Analyze and evaluate issues in order to solve problems and develop informed opinions
- Organization: Use resources effectively and efficiently in order to stay focused on different tasks
- Problem-solving: Find solutions to difficult or complex issues
- Research: Be able to search, investigate and critically analyze information in response to a specific research question
- Time management: Prioritize goals and organize time to be more productive and efficient.

Additionally, students will be:

- Using laboratory equipment
- Maintaining precision and accuracy
- Organizing and reporting data, results and conclusions
- Explaining complex ideas for technical and non-technical audiences

Degree Plan

Required Credits: 120

Code	Title	Hours
Designated Core (All courses require a grade of C or better)		
Required Courses: ¹		
MATH 1411	Calculus I	
PHYS 2320 & PHYS 2120	Introductory Mechanics and Laboratory for PHYS 2320	
PHYS 2321 & PHYS 2121	Introductory Electromagnetism and Laboratory for PHYS 2321	
University Core Curriculum		
Complete the University Core Curriculum requirements. (p. 2)		42
Biochemistry Major		
Required Courses:		
CHEM 3131	Lab for Chemistry	1
CHEM 3330	Biochem I: Struc & Function	3
CHEM 3332	Biochem II: Metabol & Bioenerg	3
CHEM 4134	Structural Biochemistry Lab	1
CHEM 4334	Structural Biochemistry	3
CHEM 4335	Biophysical Chemistry	3
Required Chemistry Courses		
CHEM 1305 & CHEM 1105	General Chemistry and Laboratory for CHEM 1305	4
CHEM 1306 & CHEM 1106	General Chemistry and Laboratory for CHEM 1306	4
CHEM 2321 & CHEM 2221	Organic Chemistry I and Organic Chemistry I Lab	5
CHEM 2322 & CHEM 2222	Organic Chemistry II and Organic Chemistry II Lab	5

CHEM 3310 & CHEM 3110	Analytical Chemistry and Lab for Chemistry 3310	4
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Other Required Courses

BIOL 1305 & BIOL 1107	General Biology and Topics in Study of Life I	4
BIOL 1306 & BIOL 1108	Organismal Biology and Organismal Biology Laboratory	4
BIOL 3314 & BIOL 3115	Molecular Cell Biology and Molecular Cell Biol Laboratory	4
BIOL 3320	Genetics	3
MATH 1312	Calculus II	3
MICR 2340 & MICR 2141	General Microbiology and Gen Microbiology Laboratory	4
MICR 3449	Prokaryotic Molecular Genetics	4
STAT 2480	Elementary Statistical Methods	4

Prescribed Elective Courses

Select Nine Hours: 9

BIOL 4388	Mammalian Physiology	
CHEM 3151 & CHEM 3351	Lab for Chemistry 3351 and Physical Chemistry I	
CHEM 3152 & CHEM 3352	Lab for Chemistry 3352 and Physical Chemistry II	
CHEM 4176	Introduction to Research	
CHEM 4211 & CHEM 4212	Instrumental Meths Analyt Chem and Lab for Chemistry 4211	
CHEM 4328	Advanced Topics Organic Chem	
CHEM 4362	Structure of Matter	
CHEM 4365	Inorganic Chemistry	
CHEM 4376	Introduction to Research	
MICR 3144 & MICR 3343	Pathogenic Microbiology Lab and Pathogenic Microbiology	
MICR 3146 & MICR 3345	Microbial Physiology Lab and Microbial Physiology	
MICR 4329	Epidemiology	
MICR 4351	General Virology	
MICR 4355	Medical Mycology	
ZOOL 4181	Vertebrate Physiology Methods	
ZOOL 4384	Cellular Neuroscience	

Total Hours 120

1 Although the UTEP choice is larger, these choices satisfy the requirements of both the core and the major.

2 A total of thirty-seven hours of upper division coursework is required of all Bachelor of Science degrees.

C Course requires a grade of C or better.

I. Communication (six hours)

Code	Title	Hours
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Courses in this category focus on developing ideas and expressing them clearly, considering the effect of the message, fostering understanding, and building the skills needed to communicate persuasively. Courses involve the command of oral, aural, written, and visual literacy skills that enable people to exchange messages appropriate to the subject, occasion, and audience.

Select six hours of the following: 6

For students whose secondary education was in English:

COMM 1611	Written and Oral Communication	
ENGL 1313	Writing About Literature	
RWS 1301	Rhetoric & Composition I	

RWS 1302	Rhetoric & Composition 2	
RWS 1601	Rhetoric, Composition & Comm	
For students whose secondary education was not in English:		
ESOL 1311	Expos Engl Compos-Spkr Esl	
ESOL 1312	Res & Crit Writng Spkr Esl	
TOTAL HOURS		6

II. American History (six hours)

Code	Title	Hours
Courses in this category focus on the consideration of past events and ideas relative to the United States, with the option of including Texas History for a portion of this component area. Courses involve the interaction among individuals, communities, states, the nation, and the world, considering how these interactions have contributed to the development of the United States and its global role.		
HIST 1301	History of U.S. to 1865	3
HIST 1302	History of U.S. Since 1865	3
TOTAL HOURS		6

III. Language, Philosophy & Culture (three hours)

Code	Title	Hours
Courses in this category focus on how ideas, values, beliefs, and other aspects of culture express and affect human experience. Courses involve the exploration of ideas that foster aesthetic and intellectual creation in order to understand the human condition across cultures.		
Select one of the following:		
		3
AFST 2300	Intro-African Amer Studies	
CHIC 2302	Latina/o Presence in the U.S.	
ENGL 2311	English Literature	
ENGL 2312	English Literature	
ENGL 2313	Intro to American Fiction	
ENGL 2314	Intro to American Drama	
ENGL 2318	Intro to American Poetry	
FREN 2322	Making of the "Other" Americas	
HIST 2301	World History to 1500	
HIST 2302	World History Since 1500	
PHIL 1301	Introduction to Philosophy	
PHIL 2306	Ethics	
RS 1301	Introduct to Religious Studies	
SPAN 2340	Seeing & Naming: Conversations	
WS 2300	Introduction to Womens Studies	
WS 2350	Global Feminisms	
TOTAL HOURS		3

IV. Mathematics (three hours)

Code	Title	Hours
Courses in this category focus on quantitative literacy in logic, patterns, and relationships. Courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experience.		
Select one of the following:		
		3
MATH 1309	College Algebra	
MATH 1310	Trigonometry and Conics	
MATH 1319	Math in the Modern World	
MATH 1320	Math for Social Sciences I	
MATH 1411	Calculus I	
MATH 1508	Precalculus	
MATH 2301	Math for Social Sciences II	
STAT 1380	Statistical Literacy	

STAT 2480

Elementary Statistical Methods

TOTAL HOURS**3****V. Life & Physical Sciences (six hours)**

Code	Title	Hours
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Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on experiences.

Select one of the following:

ASTR 1107	Astronomy Lab I	
ASTR 1307	Elem Astronomy-Solar System	
ASTR 1308	Elem Astr Stars & Galaxies	
BIOL 1103	Introductory Biology Lab	
BIOL 1104	Human Biology Laboratory	
BIOL 1107	Topics in Study of Life I	
BIOL 1108	Organismal Biology Laboratory	
BIOL 1203	Introductory Biology	
BIOL 1304	Human Biology	
BIOL 1305	General Biology	
BIOL 1306	Organismal Biology	
BIOL 2111	Human Anat/Physio Lab I	
BIOL 2113	Human Anat/Physio Lab II	
BIOL 2311	Human Anat/Physiology I	
BIOL 2313	Human Anat/Physiology II	
CHEM 1105	Laboratory for CHEM 1305	
CHEM 1106	Laboratory for CHEM 1306	
CHEM 1107	Intro General Chemistry Lab	
CHEM 1108	Intro Organic & Biochem Lab	
CHEM 1305	General Chemistry	
CHEM 1306	General Chemistry	
CHEM 1307	Intro to General Chemistry	
CHEM 1308	Intro Organic & Biochemistry	
ESCI 1101	Environmental Sci. Lab	
ESCI 1102	Non-major Lab for ESCI 1301	
ESCI 1301	Intro to Environmental Sci	
GEOG 1106	Laboratory for GEOG 1306	
GEOG 1306	Physical Geography	
GEOL 1103	Lab for GEOL 1313	
GEOL 1104	Lab for GEOL 1314	
GEOL 1111	Principles of Earth Sci - Lab	
GEOL 1112	Laboratory for Geology 1212	
GEOL 1211	Principles of Earth Sciences	
GEOL 1212	Principles of Earth Science	
GEOL 1230	The Blue Planet	
GEOL 1231	Natural Hazards	
GEOL 1313	Intro to Physical Geology	
GEOL 1314	Intro to Historical Geol	
HSCI 2302	Fundamentals of Nutrition	
HSCI 2303	Wellness Dynamics	
MICR 2330	Microorganisms and Disease	
PHYS 1403	General Physics I	
PHYS 1404	General Physics II	
PHYS 2120	Laboratory for PHYS 2320	

PHYS 2121	Laboratory for PHYS 2321	
PHYS 2320	Introductory Mechanics	
PHYS 2321	Introductory Electromagnetism	
TOTAL HOURS		6

VI. Political Science (six hours)

Code	Title	Hours
Courses in this category focus on consideration of the Constitution of the United States and the constitutions of the states, with special emphasis on that of Texas. Courses involve the analysis of governmental institutions, political behavior, civic engagement, and their political and philosophical foundations.		
Required Courses:		
POLS 2310	Introduction to Politics	3
POLS 2311	American Gover & Politics	3
TOTAL HOURS		6

VII. Social & Behavioral Sciences (three hours)

Code	Title	Hours
Courses in this category focus on the application of empirical and scientific methods that contribute to the understanding of what makes us human. Courses involve the exploration of behavior and interactions among individuals, groups, institutions, and events, examining their impact on the individual, society, and culture.		
Select one of the following:		
ANTH 1301	Intro-Phys Anth/Archeolog	3
ANTH 1302	Intro-Cultural Anthropology	
ANTH 1310	Cultural Geography	
ANTH 2320	Intro to Linguistics	
ASIA 2300	Asian American Studies	
CE 2326	Econ for Engrs & Scientists	
CHIC 2311	Intro to Chicano Studies	
COMM 2350	Interpersonal Communication	
COMM 2372	Mass Media and Society	
ECON 2303	Principles of Macroeconomics	
ECON 2304	Principles of Microeconomics	
EDPC 1301	Introduction to Ed Psychology	
EDU 1342	Action Research in Classrooms	
ENGL 2320	Introduction to Linguistics	
GEOG 1310	Cultural Geography	
LEAD 2300	Leadership in Action	
LING 2320	Introduction to Linguistics	
LING 2340	Lang. Inside & Out: Sel Topics	
PSYC 1301	Introduction to Psychology	
SOCI 1301	Introduction to Sociology	
SOCI 1310	Cultural Geography	
TOTAL HOURS		3

VIII. Creative Arts

Code	Title	Hours
Courses in this category focus on the appreciation and analysis of creative artifacts and works of the human imagination. Courses involve the synthesis and interpretation of artistic expression and enable critical, creative, and innovative communication about works of art.		
Select one of the following:		
ART 1300	Art Appreciation	3
ARTH 1305	History of Art I	
ARTH 1306	History of Art II	
CHIC 1311	Chicana/o Fine Arts Appreciat	

DANC 1304	Introduction to Dance	
FILM 1390	Intro-Art of Motion Pict.	
MUSL 1324	Music Appreciation	
MUSL 1327	Jazz to Rock	
MUSL 2321	Music, Culture, and Society	
THEA 1313	Introduction to Theatre	
TOTAL HOURS		3

IX. Component Area Option (six hours)

Code	Title	Hours
a. A minimum of 3 SCH must meet the definition and corresponding Core Objectives specified in one of the foundational component areas. b. As an option for up to 3 semester credit hours of the Component Area Option, an institution may select course(s) that: (i) Meet(s) the definition specified for one or more of the foundational component areas; and (ii) Include(s) a minimum of three Core Objectives, including Critical Thinking Skills, Communication Skills, and one of the remaining Core Objectives of the institution's choice.		
BUSN 1301	Intro to Global Business	
COMM 1301	Public Speaking	3
COMM 1302	Business/Profession Comm	
CS 1310	Intro-Computational Thinking	
CS 1320	Computer Programming Sci/Engr	
EL 1301	Eng Innovation and Leadership	
ENGR 1302	Engineering Design Experience	
ENGR 1303	Applied Engineering Analysis	
LEAD 1300	Introduction to Leadership	
SCI 1301	Inquiry in Math & Science	
SPLP 1312	Comm. Var. Across the Lifespan	
UNIV 1301	Seminar/Critical Inquiry	
TOTAL HOURS		6

4-Year Sample Degree Plan

BS Biochemistry- Starting with Calculus

Code	Title	Hours
BS BIOCHEMISTRY		
FRESHMAN		
Fall		
BIOL 1305 & BIOL 1107	General Biology and Topics in Study of Life I	4
CHEM 1305 & CHEM 1105	General Chemistry and Laboratory for CHEM 1305	4
MATH 1411	Calculus I	4
SCI 1301	Inquiry in Math & Science	3
Spring		
BIOL 1306 & BIOL 1108	Organismal Biology and Organismal Biology Laboratory	4
CHEM 1306 & CHEM 1106	General Chemistry and Laboratory for CHEM 1306	4
COMM 1301	Public Speaking	3
MATH 1312	Calculus II	3
RWS 1301	Rhetoric & Composition I	3
SOPHOMORE		
Fall		
CHEM 2321 & CHEM 2221	Organic Chemistry I and Organic Chemistry I Lab	5
HIST 1301	History of U.S. to 1865	3

PHYS 2320 & PHYS 2120	Introductory Mechanics and Laboratory for PHYS 2320	4
STAT 2480	Elementary Statistical Methods	4
Spring		
CHEM 2322 & CHEM 2222	Organic Chemistry II and Organic Chemistry II Lab	5
HIST 1302	History of U.S. Since 1865	3
PHYS 2321 & PHYS 2121	Introductory Electromagnetism and Laboratory for PHYS 2321	4
RWS 1302	Rhetoric & Composition 2	3
JUNIOR		
Fall		
CHEM 3310 & CHEM 3110	Analytical Chemistry and Lab for Chemistry 3310	4
CHEM 3330 & CHEM 3131	Biochem I:Struc & Function and Lab for Chemistry	4
PHIL 2306	Ethics	3
POLS 2310	Introduction to Politics	3
PSYC 1301	Introduction to Psychology	3
Spring		
ART 1300	Art Appreciation	3
CHEM 3332	Biochem II: Metabol & Bioenerg	3
MICR 2340 & MICR 2141	General Microbiology and Gen Microbiology Laboratory	4
POLS 2311	American Gover & Politics	3
SENIOR		
Fall		
BIOL 3314 & BIOL 3115	Molecular Cell Biology and Molecular Cell Biol Laboratory	4
CHEM 4334 & CHEM 4134	Structural Biochemistry and Structural Biochemistry Lab	4
Upper Division Elective		3
Upper Division Elective		3
Spring		
MICR 3449	Prokaryotic Molecular Genetics	4
BIOL 3320	Genetics	3
CHEM 4335	Biophysical Chemistry	3
Upper Division Elective		3
Total Hours		120

BS Biochemistry- Starting with Pre-Calculus

Code	Title	Hours
BS BIOCHEMISTRY		
FRESHMAN		
Fall		
BIOL 1305 & BIOL 1107	General Biology and Topics in Study of Life I	4
CHEM 1305 & CHEM 1105	General Chemistry and Laboratory for CHEM 1305	4
MATH 1508	Precalculus	5
SCI 1301	Inquiry in Math & Science	3
Spring		
BIOL 1306 & BIOL 1108	Organismal Biology and Organismal Biology Laboratory	4

CHEM 1306 & CHEM 1106	General Chemistry and Laboratory for CHEM 1306	4
COMM 1301	Public Speaking	3
MATH 1411	Calculus I	4
RWS 1301	Rhetoric & Composition I	3
SOPHOMORE		
Fall		
CHEM 2321 & CHEM 2221	Organic Chemistry I and Organic Chemistry I Lab	5
HIST 1301	History of U.S. to 1865	3
MATH 1312	Calculus II	3
PHYS 2320 & PHYS 2121	Introductory Mechanics and Laboratory for PHYS 2321	4
Spring		
CHEM 2322 & CHEM 2222	Organic Chemistry II and Organic Chemistry II Lab	5
HIST 1302	History of U.S. Since 1865	3
PHYS 2321 & PHYS 2121	Introductory Electromagnetism and Laboratory for PHYS 2321	4
RWS 1302	Rhetoric & Composition 2	3
STAT 2480	Elementary Statistical Methods	4
JUNIOR		
Fall		
CHEM 3310 & CHEM 3110	Analytical Chemistry and Lab for Chemistry 3310	4
CHEM 3330 & CHEM 3131	Biochem I: Struc & Function and Lab for Chemistry	4
PHIL 2306	Ethics	3
PSYC 1301	Introduction to Psychology	3
POLS 2310	Introduction to Politics	3
Spring		
ART 1300	Art Appreciation	3
CHEM 3332	Biochem II: Metabol & Bioenerg	3
MICR 2340 & MICR 2141	General Microbiology and Gen Microbiology Laboratory	4
POLS 2311	American Gover & Politics	3
SENIOR		
Fall		
BIOL 3314 & BIOL 3115	Molecular Cell Biology and Molecular Cell Biol Laboratory	4
CHEM 4334 & CHEM 4134	Structural Biochemistry and Structural Biochemistry Lab	4
Upper Division Elective		3
Upper Division Elective		3
Spring		
BIOL 3320	Genetics	3
CHEM 4335	Biophysical Chemistry	3
MICR 3449	Prokaryotic Molecular Genetics	4
Upper Division Elective		3
Total Hours		125