

# BS in Geophysics

Employment projections from the U.S. Bureau of Labor Statistics (BLS) indicate an overall 4.9% increase in geoscience jobs between 2019 and 2029, from 460,242 jobs in 2019 to 482,726 jobs in 2029. For comparison, the projected growth of the U.S. workforce over the same timeframe is expected to be 3.7%. Growth rates for individual geoscience occupations range between 0% and 8.4% for all but geoscience engineering managers (-1%).

## Marketable Skills

Students will develop:

- Communication: Reach mutual understanding through effective exchange of information, ideas, and feelings
- Critical thinking: Analyze and evaluate issues in order to solve problems and develop informed opinions
- 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
- Teamwork: Participate as an effective, efficient member of a group in order to meet a common goal
- Writing: Communicate using text in a clear and concise manner

Additionally, students will learn about 3-D spatial thinking, the ability to interpret geological maps, mapping skills, sample collection, and organization skills.

## Degree Plan

Code	Title	Hours
<b>University Core Curriculum</b>		
Complete the University Core Curriculum requirements.		42
<b>Geophysics Major Requirements</b>		
<b>Supporting Math/Science courses</b>		
CHEM 1105	Laboratory for CHEM 1305	1
CHEM 1106	Laboratory for CHEM 1306	1
CHEM 1305	General Chemistry	3
CHEM 1306	General Chemistry	3
MATH 1411	Calculus I	4
MATH 1312	Calculus II	3
MATH 2313	Calculus III	3
MATH 2326	Differential Equations	3
PHYS 2230	Thermal and Fluid Physics	2
PHYS 2320 & PHYS 2120	Introductory Mechanics and Laboratory for PHYS 2320	4
PHYS 2321 & PHYS 2121	Introductory Electromagnetism and Laboratory for PHYS 2321	4
<b>Geophysics Required Courses</b>		
GEOL 1313 & GEOL 1103	Intro to Physical Geology and Lab for GEOL 1313	4
OR		
GEOL 1211 & GEOL 1111	Principles of Earth Sciences and Principles of Earth Sci - Lab	
AND ONE OF		
GEOL 1314 & GEOL 1104	Intro to Historical Geol and Lab for GEOL 1314	4
OR		
GEOL 1212 & GEOL 1112	Principles of Earth Science and Laboratory for Geology 1212	
<b>Required Courses:</b>		
GEOL 2309 & GEOL 2109	Mineralogy & Petrology and Mineralogy & Petrology Lab	4

GEOL 3312 & GEOL 3112	Geoscience Processes and Geoscience Processes Lab	4
GEOL 3215 & GEOL 3115	Igneous/Metamorphic Petrology and Igneous/Metamorphic Petr. Lab	3
GEOL 3323 & GEOL 3123	Structural Geology and Structural Geology Lab	4
GEOL 3326 & GEOL 3126	Sedimentology & Stratigraphy and Lab for Sedim & Stratigraphy	4
GEOL 4375	Field Geology I	3
GEOP 3320A	Introduction to Geophysics	3
GEOP 3320B	Data Interp in the Geosciences	3
GEOP 4420A	Applied Geophysics I-Nonseismic	4
GEOP 4420B	Applied Geophysics II-Seismic	4
GEOP 4350	Field Geophysics	3
<b>Geophysics Electives</b>		
Select nine hours of upper division courses from CS, Engineering, GEOL, GEOP, MATH, STAT, or PHYS		9
<b>Total Hours</b>		<b>120</b>

## University Core Curriculum

The department may make specific suggestions for courses which are most applicable towards your major.

All courses require a C or better

### I. Communication (six hours)

Code	Title	Hours
The objective of the communication component is to enable the student to communicate effectively in clear and correct prose or orally in a style 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	
<b>Total Hours</b>		<b>6</b>

### II. American History (six hours)

Code	Title	Hours
The objectives of the history component are to expand students' knowledge of the origin and history of the U.S., their comprehension of the past and current role of the U.S. in the world, and their ability to critically evaluate and analyze historical evidence. U.S. history courses (three hours must be Texas history) include:		
HIST 1301	History of U.S. to 1865	3
HIST 1302	History of U.S. Since 1865	3
<b>Total Hours</b>		<b>6</b>

### III. Language, Philosophy & Culture (three hours)

Code	Title	Hours
The objective of the humanities component is to expand students' knowledge of the human condition and human cultures, especially in relation to behaviors, ideas, and values expressed in works of human imagination and thought. Through study in disciplines such as literature and philosophy, students engage in critical analysis and develop an appreciation of the humanities as fundamental to the health and survival of any society.		

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
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The objective of the mathematics component is to develop a quantitatively literate college graduate. Every college graduate should be able to apply basic mathematical tools in the solution of real-world problems.

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 <sup>1,2</sup>
MATH 2301	Math for Social Sciences II
STAT 1380	Statistical Literacy
STAT 2480	Elementary Statistical Methods

1 A higher-level course in the calculus sequence can be substituted.

2 TCCN MATH 1314 will also satisfy this requirement.

**Total Hours** 3

#### V. Life & Physical Sciences (six hours)

Code	Title	Hours
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The objective of the study of the natural sciences is to enable the student to understand, construct, and evaluate relationships in the natural sciences, and to enable the student to understand the bases for building and testing theories. The courses listed are for non-majors; the major courses in the discipline can be substituted for the non-major sequence. A minimum of two semesters of lecture and one semester of laboratory associated with one of the courses, or two semesters of combined (3 credit) lecture-laboratory courses (Only six hours apply toward the required 42.):

Select one of the following: 1-4

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 1202	Intro to Environment Science 2
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
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The objectives of the political science component are to expand students' knowledge of the origin and evolution of the U.S. and Texas political systems, focusing on the growth of political institutions, and on the constitutions of Texas and the United States; and to enhance their understanding of federalism, states rights, and individual civil liberties, rights, and responsibilities.

Required Courses:

POLS 2310	Introduction to Politics	3
POLS 2311	American Govern & Politics	3

**Total Hours** **6**

## VII. Social and Behavioral Sciences (three hours)

Code	Title	Hours
The objective of the social and behavioral science component is to increase students' knowledge of how social and behavioral scientists discover, describe, and explain the behaviors and interactions among individuals, groups, institutions, events, and ideas. Such knowledge will better equip students to understand themselves and the roles they play in addressing the issues facing humanity.		
Select one of the following:		3
ANTH 1301	Intro-Phys Anth/Archeolog	
ANTH 1302	Intro-Cultural Anthropology	
ANTH 1310	Cultural Geography	
ANTH 2320	Intro to Linguistics	
CE 2326	Econ for Engrs & Scientists	
ASIA 2300	Asian American 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	Community Service	
LING 2320	An Intro. to Linguistics	
LING 2340	Lang. Inside & Out: Sel Topics	
PSYC 1301	Introduction to Psychology	
SOCI 1301	Introduction to Sociology	
SOCI 1310	Cultural Geography	
<b>Total Hours</b>		<b>3</b>

## VIII. Creative Arts (three hours)

Code	Title	Hours
The objective of the visual and performing arts component is to expand students' knowledge and appreciation of the human imagination as expressed through works of visual art, dance, music, theatre and film. Through study in these disciplines, students will form aesthetic judgments and develop an appreciation of the arts as fundamental to the health and survival of any society.		
Select one of the following:		3
ART 1300	Art Appreciation	
ARTH 1305	History of Art I	
ARTH 1306	History of Art II	
CHIC 1311	Chicana/o Fine Arts Appreciat	
DANC 1304	Dance Appreciation	
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	
<b>Total Hours</b>		<b>3</b>

## IX. Component Area Option (six hours)

Code	Title	Hours
The objective of the institutionally designated option component is to develop the critical thinking skills and academic tools required to be an effective learner. Special emphasis is placed on the use of technology in problem-solving, communications, and knowledge acquisition.		
Select two of the following:		6
BUSN 1301	Intro to Global Business	
COMM 1301	Public Speaking	

COMM 1302	Business/Profession Comm
CS 1310	Intro-Computational Thinking
CS 1320	Computer Programming Sci/Engr
EL 1301	Eng Innovation and Leadership
LEAD 1300	Introduction to Leadership
SCI 1301	Inquiry in Math & Science
UNIV 1301	Seminar/Critical Inquiry

**Total Hours****6**

## Bachelor of Science in Geophysics (Starting with Calculus)

Code	Title	Hours
<b>Bachelor of Science in Geophysics (Starting with Calculus)</b>		
<b>FRESHMAN</b>		
<b>Fall</b>		
GEOL 1313 & GEOL 1103	Intro to Physical Geology and Lab for GEOL 1313	4
MATH 1411	Calculus I	4
RWS 1301	Rhetoric & Composition I	3
UNIV 1301	Seminar/Critical Inquiry	3
<b>Spring</b>		
CHEM 1305 & CHEM 1105	General Chemistry and Laboratory for CHEM 1305	4
GEOL 1314 & GEOL 1104	Intro to Historical Geol and Lab for GEOL 1314	4
MATH 1312	Calculus II	3
RWS 1302	Rhetoric & Composition 2	3
<b>SOPHOMORE</b>		
<b>Fall</b>		
CHEM 1306 & CHEM 1106	General Chemistry and Laboratory for CHEM 1306	4
GEOL 2309 & GEOL 2109	Mineralogy & Petrology and Mineralogy & Petrology Lab	4
GEOL 3312 & GEOL 3112	Geoscience Processes and Geoscience Processes Lab	4
PHYS 2320 & PHYS 2120	Introductory Mechanics and Laboratory for PHYS 2320	4
<b>Spring</b>		
Creative Arts Area		3
HIST 1301	History of U.S. to 1865	3
MATH 2313	Calculus III	3
GEOL 3215 & GEOL 3115	Igneous/Metamorphic Petrology and Igneous/Metamorphic Petr. Lab	3
GEOP 3320A	Introduction to Geophysics	3
<b>JUNIOR</b>		
<b>Fall</b>		
HIST 1302	History of U.S. Since 1865	3
MATH 2326	Differential Equations	3
PHYS 2321 & PHYS 2121	Introductory Electromagnetism and Laboratory for PHYS 2321	4
GEOL 3323 & GEOL 3123	Structural Geology and Structural Geology Lab	4
GEOL 3326 & GEOL 3126	Sedimentology & Stratigraphy and Lab for Sedim & Stratigraphy	4
<b>Spring</b>		

COMM 1302	Business/Profession Comm	3
GEOP 3320B	Data Interp in the Geosciences	3
PHYS 2230	Thermal and Fluid Physics	2
POLS 2310	Introduction to Politics	3
Social & Behavioral Sciences Area		3
<b>SENIOR</b>		
<b>Fall</b>		
GEOL 4375	Field Geology I	3
GEOP 4420A	Applied GeophysicsI-Nonseismic	4
Elective		3
Language, Philosophy and Culture Area		3
<b>Spring</b>		
GEOL 4350		3
GEOP 4420B	Applied Geophysics II-Seismic	4
POLS 2311	American Gover & Politics	3
Elective		3
Elective		3
<b>Total Hours</b>		<b>120</b>

## Bachelor of Science in Geophysics (Starting with Pre-Calculus)

Code	Title	Hours
<b>Bachelor of Science in Geophysics (Starting with Pre-Calculus)</b>		
<b>FRESHMAN</b>		
<b>Fall</b>		
GEOL 1313 & GEOL 1103	Intro to Physical Geology and Lab for GEOL 1313	4
MATH 1508	Precalculus	5
RWS 1301	Rhetoric & Composition I	3
UNIV 1301	Seminar/Critical Inquiry	3
<b>Spring</b>		
CHEM 1305 & CHEM 1105	General Chemistry and Laboratory for CHEM 1305	4
GEOL 1314 & GEOL 1104	Intro to Historical Geol and Lab for GEOL 1314	4
MATH 1411	Calculus I	4
RWS 1302	Rhetoric & Composition 2	3
<b>SOPHOMORE</b>		
<b>Fall</b>		
CHEM 1306 & CHEM 1106	General Chemistry and Laboratory for CHEM 1306	4
GEOL 2309 & GEOL 2109	Mineralogy & Petrology and Mineralogy & Petrology Lab	4
GEOL 3312 & GEOL 3112	Geoscience Processes and Geoscience Processes Lab	4
MATH 1312	Calculus II	3
PHYS 2320 & PHYS 2120	Introductory Mechanics and Laboratory for PHYS 2320	4
<b>Spring</b>		
Creative Arts Area		3
MATH 2313	Calculus III	3
GEOL 3215 & GEOL 3115	Igneous/Metamorphic Petrology and Igneous/Metamorphic Petr. Lab	3
GEOP 3320A	Introduction to Geophysics	3

HIST 1301	History of U.S. to 1865	3
<b>JUNIOR</b>		
<b>Fall</b>		
GEOL 3323 & GEOL 3123	Structural Geology and Structural Geology Lab	4
GEOL 3326 & GEOL 3126	Sedimentology & Stratigraphy and Lab for Sedim & Stratigraphy	4
HIST 1302	History of U.S. Since 1865	3
MATH 2326	Differential Equations	3
PHYS 2321 & PHYS 2121	Introductory Electromagnetism and Laboratory for PHYS 2321	4
<b>Spring</b>		
COMM 1302	Business/Profession Comm	3
GEOP 3320B	Data Interp in the Geosciences	3
PHYS 2230	Thermal and Fluid Physics	2
POLS 2310	Introduction to Politics	3
Social & Behavioral Sciences Area		3
<b>SENIOR</b>		
<b>Fall</b>		
GEOL 4375	Field Geology I	3
GEOP 4420A & GEOP 4420B	Applied Geophysics I-Nonseismic and Applied Geophysics II-Seismic	8
Elective		3
Language, Philosophy and Culture Area		3
<b>Spring</b>		
GEOL 4350		3
POLS 2311	American Gover & Politics	3
Elective		3
Elective		3
<b>Total Hours</b>		<b>125</b>