



BS in EARTH AND SPACE SCIENCE EDUCATION (694020) MAP Sheet

Department of Geological Sciences

For students entering the degree program during the 2016–2017 curricular year.

This major is designed to prepare students to teach in public schools. In order to graduate with this major, students are required to complete Utah State Office of Education licensing requirements. To view these requirements go to <http://education.byu.edu/ess/licensing.html> or contact Education Student Services, 350 MCKB, (801) 422-3426.

UNIVERSITY CORE AND GRADUATION REQUIREMENTS				PROGRAM REQUIREMENTS (84–86 total hours)	
UNIVERSITY CORE REQUIREMENTS				<p>For students accepted into the major after August 1, 2014, grades below C in any required coursework in a teaching major or teaching minor will not be accepted. Teacher candidates must maintain a total GPA of 3.0 or higher throughout the program and to qualify for student teaching.</p> <p>Complete the following:</p> <p>Geol 111 Physical Geology 4.0 Geol 112 Historical Geology 4.0 Geol 210* Field Studies 3.0 Geol 411 Geomorphology and Remote Sensing 3.0</p> <p>Complete 2 hours of the following</p> <p>Geol 491R Geology Seminar (take 4 times) 0.5</p> <p>Select three courses from the following:</p> <p>Geol 100 Dinosaurs 3.0 Geol 109 Geology of the Planets 3.0 Geol 230 Geological Communications 3.0 Geol 351 Mineralogy 4.0 Geol 352 Petrology 3.0 Geol 370 Sedimentology and Stratigraphy 3.0 Geol 375 Structural Geology 3.0 Geol 405 Applied Math in Geol Sciences 3.0 Geol 435 Introduction to Groundwater 3.0 Geol 440 Solid Earth Geophysics 3.0 Geol 445 Geochemistry 3.0 Geol 452 Petrography to Petrogenesis 3.0 Geol 460 Economic and Resource Geology 3.0 Geol 476 Introduction to Seismic Interpretation 3.0 Geol 480 Paleontology 3.0</p> <p>Complete one of the following options:</p> <p>Either</p> <p>Chem 105 General College Chemistry 4.0 Chem 106 General College Chemistry 3.0 Chem 107 General College Chemistry Laboratory 1.0</p> <p>Or</p> <p>Chem 111 Principles of Chemistry 4.0 Chem 112 Principles of Chemistry 3.0</p>	
<u>Requirements</u>	<u>#Classes</u>	<u>Hours</u>	<u>Classes</u>		
Doctrinal Foundation				<p>Complete the following:</p> <p>Engl 316* Technical Communication 3.0 Math 112* Calculus 1 4.0 Phil 423* History and Philosophy of Science 3.0 Phscs 105 General Physics 1 3.0 Phscs 106 General Physics 2 3.0 Phscs 107 General Physics Lab 1 1.0 Phscs 108 General Physics Lab 2 1.0 Phscs 127 Descriptive Astronomy 3.0 Phscs 137 Severe & Hazardous Weather 3.0</p> <p>Complete the Professional Education Component:</p> <p>Complete the teacher licensure requirements: Contact Education Student Services, 120 MCKB, 422-3426, to schedule the final interview to clear your application for the secondary teaching license. You should be registered for your last semester at BYU prior to the scheduled appointment.</p> <p>A. Complete the following:</p> <p>CPSE 402 Educating Students with Disabilities 2.0 IP&T 286 Instructional Technology in Teaching 1.0 Phy S 276 Exploration of Teaching 4.0 Phy S 377 Teaching Methods and Instruction 3.0 Phy S 378 Practicum in Secondary Education 1.0 Sc Ed 353* Multicultural Education 2.0 Sc Ed 375 Adolescent Dev & Classroom Mgt 3.0</p> <p>Note: FBI fingerprint and background clearance must be completed before enrollment in Phy S 276.</p> <p>B. Complete 12 hours from one of the following:</p> <p>Sc Ed 476 Secondary Student-Teaching 12.0 Sc Ed 496 Academic Internship: Sec Educ 12.0</p>	
Teachings and Doctrine, Book of Mormon	1	2.0	Rel A 275		
Jesus Christ & the Everlasting Gospel	1	2.0	Rel A 250		
Foundations of the Restoration	1	2.0	Rel C 225		
The Eternal Family	1	2.0	Rel C 200		
The Individual and Society				<p>Complete the following:</p> <p>Engl 316* Technical Communication 3.0 Math 112* Calculus 1 4.0 Phil 423* History and Philosophy of Science 3.0 Phscs 105 General Physics 1 3.0 Phscs 106 General Physics 2 3.0 Phscs 107 General Physics Lab 1 1.0 Phscs 108 General Physics Lab 2 1.0 Phscs 127 Descriptive Astronomy 3.0 Phscs 137 Severe & Hazardous Weather 3.0</p> <p>Complete the Professional Education Component:</p> <p>Complete the teacher licensure requirements: Contact Education Student Services, 120 MCKB, 422-3426, to schedule the final interview to clear your application for the secondary teaching license. You should be registered for your last semester at BYU prior to the scheduled appointment.</p> <p>A. Complete the following:</p> <p>CPSE 402 Educating Students with Disabilities 2.0 IP&T 286 Instructional Technology in Teaching 1.0 Phy S 276 Exploration of Teaching 4.0 Phy S 377 Teaching Methods and Instruction 3.0 Phy S 378 Practicum in Secondary Education 1.0 Sc Ed 353* Multicultural Education 2.0 Sc Ed 375 Adolescent Dev & Classroom Mgt 3.0</p> <p>Note: FBI fingerprint and background clearance must be completed before enrollment in Phy S 276.</p> <p>B. Complete 12 hours from one of the following:</p> <p>Sc Ed 476 Secondary Student-Teaching 12.0 Sc Ed 496 Academic Internship: Sec Educ 12.0</p>	
Citizenship					
American Heritage	1–2	3–6.0	from approved list		
Global & Cultural Awareness	1	3.0	Sc Ed 353*		
Skills				<p>Complete the following:</p> <p>Engl 316* Technical Communication 3.0 Math 112* Calculus 1 4.0 Phil 423* History and Philosophy of Science 3.0 Phscs 105 General Physics 1 3.0 Phscs 106 General Physics 2 3.0 Phscs 107 General Physics Lab 1 1.0 Phscs 108 General Physics Lab 2 1.0 Phscs 127 Descriptive Astronomy 3.0 Phscs 137 Severe & Hazardous Weather 3.0</p> <p>Complete the Professional Education Component:</p> <p>Complete the teacher licensure requirements: Contact Education Student Services, 120 MCKB, 422-3426, to schedule the final interview to clear your application for the secondary teaching license. You should be registered for your last semester at BYU prior to the scheduled appointment.</p> <p>A. Complete the following:</p> <p>CPSE 402 Educating Students with Disabilities 2.0 IP&T 286 Instructional Technology in Teaching 1.0 Phy S 276 Exploration of Teaching 4.0 Phy S 377 Teaching Methods and Instruction 3.0 Phy S 378 Practicum in Secondary Education 1.0 Sc Ed 353* Multicultural Education 2.0 Sc Ed 375 Adolescent Dev & Classroom Mgt 3.0</p> <p>Note: FBI fingerprint and background clearance must be completed before enrollment in Phy S 276.</p> <p>B. Complete 12 hours from one of the following:</p> <p>Sc Ed 476 Secondary Student-Teaching 12.0 Sc Ed 496 Academic Internship: Sec Educ 12.0</p>	
Effective Communication					
First-Year Writing	1	3.0	from approved list		
Adv Written & Oral Communication	1	3.0	Engl 316*		
Quantitative Reasoning	0–1	0–4.0	Math 112*		
Languages of Learning (Math or Language)	1	4.0	Math 112*		
Arts, Letters, and Sciences				<p>Complete the following:</p> <p>Engl 316* Technical Communication 3.0 Math 112* Calculus 1 4.0 Phil 423* History and Philosophy of Science 3.0 Phscs 105 General Physics 1 3.0 Phscs 106 General Physics 2 3.0 Phscs 107 General Physics Lab 1 1.0 Phscs 108 General Physics Lab 2 1.0 Phscs 127 Descriptive Astronomy 3.0 Phscs 137 Severe & Hazardous Weather 3.0</p> <p>Complete the Professional Education Component:</p> <p>Complete the teacher licensure requirements: Contact Education Student Services, 120 MCKB, 422-3426, to schedule the final interview to clear your application for the secondary teaching license. You should be registered for your last semester at BYU prior to the scheduled appointment.</p> <p>A. Complete the following:</p> <p>CPSE 402 Educating Students with Disabilities 2.0 IP&T 286 Instructional Technology in Teaching 1.0 Phy S 276 Exploration of Teaching 4.0 Phy S 377 Teaching Methods and Instruction 3.0 Phy S 378 Practicum in Secondary Education 1.0 Sc Ed 353* Multicultural Education 2.0 Sc Ed 375 Adolescent Dev & Classroom Mgt 3.0</p> <p>Note: FBI fingerprint and background clearance must be completed before enrollment in Phy S 276.</p> <p>B. Complete 12 hours from one of the following:</p> <p>Sc Ed 476 Secondary Student-Teaching 12.0 Sc Ed 496 Academic Internship: Sec Educ 12.0</p>	
Civilization 1 and 2	2	6.0	from approved list		
Arts	1	3.0	from approved list		
Letters	1	3.0	Phil 423*		
Scientific Principles & Reasoning					
Biological Science	1–2	3–5.0	from approved list		
Physical Science	1	3.0	Geol 210*		
Social Science	1	3.0	from approved list		
Core Enrichment: Electives				<p>Complete the following:</p> <p>Engl 316* Technical Communication 3.0 Math 112* Calculus 1 4.0 Phil 423* History and Philosophy of Science 3.0 Phscs 105 General Physics 1 3.0 Phscs 106 General Physics 2 3.0 Phscs 107 General Physics Lab 1 1.0 Phscs 108 General Physics Lab 2 1.0 Phscs 127 Descriptive Astronomy 3.0 Phscs 137 Severe & Hazardous Weather 3.0</p> <p>Complete the Professional Education Component:</p> <p>Complete the teacher licensure requirements: Contact Education Student Services, 120 MCKB, 422-3426, to schedule the final interview to clear your application for the secondary teaching license. You should be registered for your last semester at BYU prior to the scheduled appointment.</p> <p>A. Complete the following:</p> <p>CPSE 402 Educating Students with Disabilities 2.0 IP&T 286 Instructional Technology in Teaching 1.0 Phy S 276 Exploration of Teaching 4.0 Phy S 377 Teaching Methods and Instruction 3.0 Phy S 378 Practicum in Secondary Education 1.0 Sc Ed 353* Multicultural Education 2.0 Sc Ed 375 Adolescent Dev & Classroom Mgt 3.0</p> <p>Note: FBI fingerprint and background clearance must be completed before enrollment in Phy S 276.</p> <p>B. Complete 12 hours from one of the following:</p> <p>Sc Ed 476 Secondary Student-Teaching 12.0 Sc Ed 496 Academic Internship: Sec Educ 12.0</p>	
Religion Electives	3–4	6.0	from approved list		
Open Electives	Variable	Variable	personal choice		
GRADUATION REQUIREMENTS:				<p>Complete the following:</p> <p>Engl 316* Technical Communication 3.0 Math 112* Calculus 1 4.0 Phil 423* History and Philosophy of Science 3.0 Phscs 105 General Physics 1 3.0 Phscs 106 General Physics 2 3.0 Phscs 107 General Physics Lab 1 1.0 Phscs 108 General Physics Lab 2 1.0 Phscs 127 Descriptive Astronomy 3.0 Phscs 137 Severe & Hazardous Weather 3.0</p> <p>Complete the Professional Education Component:</p> <p>Complete the teacher licensure requirements: Contact Education Student Services, 120 MCKB, 422-3426, to schedule the final interview to clear your application for the secondary teaching license. You should be registered for your last semester at BYU prior to the scheduled appointment.</p> <p>A. Complete the following:</p> <p>CPSE 402 Educating Students with Disabilities 2.0 IP&T 286 Instructional Technology in Teaching 1.0 Phy S 276 Exploration of Teaching 4.0 Phy S 377 Teaching Methods and Instruction 3.0 Phy S 378 Practicum in Secondary Education 1.0 Sc Ed 353* Multicultural Education 2.0 Sc Ed 375 Adolescent Dev & Classroom Mgt 3.0</p> <p>Note: FBI fingerprint and background clearance must be completed before enrollment in Phy S 276.</p> <p>B. Complete 12 hours from one of the following:</p> <p>Sc Ed 476 Secondary Student-Teaching 12.0 Sc Ed 496 Academic Internship: Sec Educ 12.0</p>	
Minimum residence hours required		30.0			
Minimum hours needed to graduate		120.0			

***THESE CLASSES CAN FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (16–20 hours overlap)**

FOR UNIVERSITY CORE OR PROGRAM QUESTIONS CONTACT
 THE ADVISEMENT CENTER
 Physical and Mathematical Sciences College Advisement Center
 N-181 ESC
 Brigham Young University, Provo, UT 84602
 Telephone: (801) 422-2674

FACULTY ADVISOR:
 Duane Merrell
 N-143 ESC
 Brigham Young University, Provo, UT 84602
 Telephone: (801) 422-2255

LICENSURE ADVISOR
 Tara Goulding
 120 MCKB
 Brigham Young University, Provo, UT 84602
 Telephone: (801) 422-7327

**BS IN EARTH AND SPACE SCIENCE EDUCATION (694020)
2016–2017**

Suggested Sequence of Courses:

FRESHMAN YEAR**

<u>1st Semester</u>	
1 st Year Writing	3.0
or A Htg 100	(3.0)
Geol 111 (FW)	4.0
Math 112 (FWSpSu)	4.0
Phscs 105, 107 (FWSp)	4.0
Religion Cornerstone course	2.0
Total Hours	17.0

2nd Semester

A Htg 100	3.0
or 1 st Year Writing	(3.0)
Chem 105 (FWSpSu)	4.0
or Chem 111	(4.0)
Geol 112 (W)	4.0
Phscs 106, 108 (FWSu)	4.0
Religion Cornerstone course	2.0
Total Hours	17.0

SOPHOMORE YEAR**

<u>3rd Semester</u>	
Chem 106, 107 (FWSpSu)	4.0
or Chem 112	(3.0)
Geol 210 (F)	3.0
(Begins meeting before start of Fall semester)	
Phscs 127 (FWSpSu)	3.0
Civilization 1	3.0
Religion Cornerstone course	2.0
Total Hours	14-15.0

4th Semester

Geology elective	3.0
Geol 491R (FW)	0.5
Phscs 137 (FW)	3.0
Civilization 2	3.0
Social Science	3.0
Religion Cornerstone course	2.0
Total Hours	14.5

****Note:**

The sequence of courses suggested may not fit the circumstances of every student. Students should contact their college advisement center for help in outlining an efficient schedule.

Note: Students are encouraged to complete an average of 15 credit hours each semester or 30 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.

JUNIOR YEAR**

5th Semester

Geology 411 (F)	3.0
Geol 491R (FW)	0.5
Engl 316 (FWSpSu)	3.0
Phy S 276R (FWSp)	4.0
Arts	3.0
Religion Elective	2.0
Total Hours	15.5

6th Semester

Phil 423 (FW)	3.0
Geol 491R (FW)	0.5
Geology elective	3.0
CPSE 402	2.0
Sc Ed 353	2.0
Biological Science	3.0
Religion Elective	2.0
Total Hours	15.5

SENIOR YEAR**

7th Semester

IP&T 286 (FWSpSu)	1.0
Geol 491R (FW)	0.5
Geology elective	3.0
Phy S 377	3.0
Phy S 378	1.0
Sc Ed 375	3.0
Global & Cultural Awareness	3.0
Religion Elective	2.0
Total Hours	16.5

8th Semester

Sc Ed 476R or 496R (FW)	12.0
Total Hours	12.0

THE DISCIPLINE:

Geological sciences consist of a number of disciplines aimed at understanding the Earth's origin and development and the natural processes that have operated upon it and within it from the time of formation of the solar system. With the development of remote sensing technology and the exploration of the solar system by spacecraft, geological sciences have become increasingly important for understanding not only the Earth but the Moon, other planets and their moons, and small bodies that orbit the sun.

Understanding the dynamic processes of Earth and other planets is relevant to many societal needs, such as assessment and forecasting of natural hazards, environmental change, and discovery of energy and mineral resources. Some of the diverse disciplines that can be studied in this department include general geology, plate tectonics, volcanology, geochemistry, geophysics, paleontology, environmental geology, petroleum geology, hydrogeology, paleoclimatology, and planetary geology.

CAREER OPPORTUNITIES:

Graduates have the opportunity to work both outdoors and in the laboratory, pursuing careers in energy, mineral, and water resources or in environmental evaluation with industry, government, or consulting firms. The substantial preparation in basic sciences and mathematics also leads to a broad spectrum of teaching opportunities. Some scholarship money is available for those who pursue a geological sciences degree as a pre-law track. The most marketable terminal degree in geological sciences is the MS. Starting salaries for this degree are often very competitive with any other discipline.

Department of Geological Sciences
S-389 ESC

Brigham Young University, Provo, UT 84602
Telephone: (801) 422-3918