



Undergraduate Advising Handbook  
Department of Geological Sciences

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## BACHELOR'S OF SCIENCE: GEOLOGY

To track your progress in fulfilling the following requirements access your Titan Degree Audit (<http://www.fullerton.edu> → Portal login → Student Activities → TITAN degree audit)

### A. Major Requirements

- 39-40 units of core geology courses (minimum grade of C in each course)
- 8-9 units of geology electives (minimum grade of C in each course)
- 30 units of related fields courses (GPA > 2.0)

### B. University Requirements

General education (GE) requirements (at least 30 units) from the following list. For detail description of each category, review CSUF's catalog ([www.fullerton.edu/catalog](http://www.fullerton.edu/catalog))

- A. Core Competencies - 9 units minimum
  - B. Scientific Inquiry and Quantitative Reasoning - 12 unites minimum
- Note: Courses taken for major count towards this requirement see table below*
- C. Arts and Humanities - 12 units minimum
  - D. Social Sciences - 15 units minimum
  - E. Lifelong Learning and Self-Development - 3 units minimum
  - Z. Cultural Diversity - 3 units minimum

		Major	Prerequisite	General Education Course
B.1	Physical Science	Physics	CHEM 115	CHEM 120A
		Geology	CHEM 115	CHEM 120A AND PHYS 225/211
		Earth Science		CHEM 100/102/120A AND PHYS 101/211/225
B.2	Life Science	Physics Geology Mathematics		BIOL 101 BIOL 101 or BIOL 171 BIOL 101
B.3	Laboratory Experience	Physics Geology	CHEM 115 CHEM 115	CHEM 120A CHEM 120A
B.4	Mathematics Quantitative Reasoning	Physics Mathematics	MATH 125/MQE/Dept. Approval	MATH 150A
		Geology	MATH 125/MQE/Dept. Approval OR MATH 115/MQE/Dept. Approval	MATH150A or MATH 130
		Earth Science	None MATH 125/MQE/Dept. Approval MATH 115/MQE/Dept. Approval	MATH 120 or 125 or MATH 150A or MATH 130 or 135
B.5	Implications and Explorations in Math and Natural Science	Geology		PHYS 226 or 212

**TABLE 1:** The GE B. Scientific Inquiry and Quantitative Reasoning category is divided into 5 sections. This table depicts the courses that count towards your GE AND major requirements. For example: a Geology major must take CHEM 120A to fulfill a major requirement but this course also fulfills the GE B.1 Physical Science requirement. Thus upon graduation, both Geology and Earth Science majors will fulfill their GE B requirement by taking their required major courses.

## BACHELOR OF SCIENCE IN GEOLOGY

### Core Courses

Of the 120 units required for graduation, the Bachelor of Science in Geology requires 48 units in the major: including core course units and geology electives. Students must have a “C” (2.0) or better in all geological sciences courses applied towards the requirement. The following table lists the minimum course requirements for the major.

Department Code	Title	Units
GEOL 101, 110T, or 140	Physical Geology, Topics in Earth Sciences, Earth’s Atm. & Ocean	3-4
GEOL 101L	Physical Geology Lab	1
GEOL 201	Earth History	3
GEOL 303A	Mineralogy	4
GEOL 303B	Igneous & Metamorphic Petrology	4
GEOL 321	Sedimentology & Stratigraphy	4
GEOL 335	Hydrology & Surface Processes	3
GEOL 360	Structural Geology	4
GEOL 380	Geological Field Techniques	3
GEOL 498	Undergraduate Thesis	3
GEOL 481A	Geology Field Camp	4
<b>Total</b>		<b>36 units</b>

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## DEPARTMENT OF GEOLOGICAL SCIENCES

### Geology Electives

Students choose: Geochemistry or Geophysics. In addition, students select 8-9 units of upper-division geological sciences electives in consultation with their advisor. No more than 3 units from a combination of GEOL 493, 495, 496L and 499L can be counted toward this requirement. GEOL 310T does NOT count for this requirement.

Department Code	Title	Units
GEOL 406 or GEOL 456	Geochemistry or Geophysics	3
Upper-division GEOL	Discuss potential elective with geology advisor	9
<b>Total</b>		<b>12 units</b>

### Related Fields Electives

Students must have a 2.0 average in related fields course. At least one of the related field's tracks must include a second semester lab course. If the selected related field's courses total less than 30 units, addition units must be taken from other science-math-engineering departments including geography and anthropology. Consult your geology advisor on potential courses.

Department Code	Title	Units
BIO 101 or 171	Elements of Biology or Evolution and Biodiversity	3 or 5
CHEM 120A and 120B or CHEM 120A and 125	General Chemistry or General Chemistry for Engineers	8 or 10
MATH 150A and 150B or MATH 130 and MATH 338	Calculus or Short Course in Calculus and Statistics in Lab Sciences	7 or 8
PHYS 225, 225L and PHYS 226 or PHYS 211, 211L, 212	Fundamental Physics-Mechanics, Electricity and Magnetism or Elementary Physics	
<b>Total</b>	<b>MUST BE</b>	<b>30 units</b>

# BACHELOR OF SCIENCE IN GEOLOGY

## Sample Course Matrix

Fall Geology Classes	Spring Geology Classes	Geology Classes Taught Every Semester
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### FRESHMAN

Fall Semester	Units	Spring Semester	Units
GE A.1 Oral Comm (HCOM 100)	3	GE A.3 Critical Thinking (READ 290)	3
GE A.2 Written Comm (ENGL 101)	3	GE C.4 World Civ (HIST 110A)	3
GEOL 101 Physical Geology	3	GEOL 201 Earth History	3
GEOL 101L Physical Geology Lab	1	MATH 130 OR 150A OR MATH 338	5
MATH 115 (for MATH 130) <b>OR</b> MATH 125 (for MATH 150A) <b>OR</b> MATH 130	5	MATH 130W – if taking MATH 130	(1)
<b>TAKE CHEMISTRY PLACEMENT EXAM</b>		<b>CHEM 115 POSSIBLY</b>	(4)
Total	16		15

### SOPHOMORE

Fall Semester	Units	Spring Semester	Units
GE D.2 World Civ (HIST 110B)	3	GE D.4 American Govt (POSC 100)	3
GE D.3 American History (HIST 180)	3	GEOL 335 Surface Processes & Hydrology	3
MATH 150B or MATH 338	4	BIOL 101	3
CHEM 120A	5	CHEM 120B OR CHEM 125	5/3
Total	15		14/12

### JUNIOR

Fall Semester	Units	Spring Semester	Units
GE C.1 Arts (ART 101)	3	GE C.2 Humanities (PHIL 120)	3
PHYS 211/211L OR PHYS 225/225L	4	PHYS 212/212L OR PHYS 226/226L	4
GEOL 303A Earth Materials	4	GEOL 303B Ig/Met Petrology	4
GEOL 380 Field Methods	3	GEOL 406 (Geochemistry – odd years) OR GEOL 456 (Geophysics – even years)	3
		GEOL 498	1
Total	14		15

### SENIOR

Fall Semester	Units	Spring Semester	Units
GE C.3 Arts/Hum Exploration (ANTH 305)	3	GE D.5 Soc. Sci. Exploration (ANTH 310)	3
GE D.1 Social Sciences (GEOG 101)	4	GE E Lifelong learning (BIOL 360)	3
GEOL 360 Structural Geology	4	GEOL 321 Sedimentology/Stratigraphy	4
GEOL elective	3	GEOG 481 Geographic Info Systems	3
GEOL 498	1	GEOL elective	3
		GEOL 498	1
Total	15		17
		<b>Summer Semester</b>	<b>Units</b>
		GEOL 481A	4

## BACHELOR OF ARTS IN EARTH SCIENCE

### Core Courses

Of the 120 units required for graduation, the Bachelor of Arts in Earth Science requires a minimum of 32 units of Earth Science courses in Geology and Geography. Students must have a “C” (2.0) or better in all Earth science courses applied toward the requirement.

Department Code	Title	Units
GEOL 101, 110T, 140, or 102	Physical geology, Topics in Earth Science, Earth's atm. and Oceans, Earth and Astronomical Science for Future Teachers	3 or 4
GEOL 101L	Physical Geology lab	1
GEOL 201	Earth History	3
GEOL 333	General Oceanography	3
GEOL 335	Hydrology and Surface Processes	3
GEOL 380	Geological Field Techniques	3
GEOL 420 or 470	Earth Science for Science Teachers or Environmental Geology and Planning	4
<b>Total</b>		<b>20-21 units</b>

### Earth Science Electives

The following is a list of possible Earth Science electives. Your geology advisor may approve additional courses. At least 6 units must be Geological Science courses. Note: no more than 3 units from any combination of GEOL 493, 495, 496L, 498, and 499L can be counted toward the requirement. GEOL 102 (if GEOL 101 is taken in core) and/or GEOL 140 may be taken if student is in teaching pathway.

Department Code
GEOL 303A, 303B, 305, 310T*, 321, 322, 355, 360, 376, 404, 406, 408, 410, 420, 436, 455, 456, 470, 475, 481A, 481B, 481C, 493, 495, 496L, 498, 499L
GEOG 312, 323, 325, 328**, 329**, 350**, 422, 425, 426, 450, 452**, 481, 482, 485, 486, 488
<b>Total: 12-15 units</b>
<i>*No more than 6 units of GEOL 310T may be taken; **No more than 6 units of these courses may be taken</i>

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## DEPARTMENT OF GEOLOGICAL SCIENCES

### Related Fields Core

Students must take at least one class from each of the related field subjects and at least one of these courses must have an associated lab. Students must take a minimum of 24 units in related fields and must have a 2.0 average in required related fields courses. Courses not included on the list must be approved in writing by your geology advisor.

#### Department Code

BIOL 101/L or 152 or 102 or accepted life science course from another institution

CHEM 100L or \*PHYS/CHEM 102, or CHEM 120A

PHYS 101/L or \*PHYS/CHEM 102 or 115 or 211/L or 225/L

MATH 120 or 125 or 130 or 135 or 150A

GEOG 110

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**Total: 16-22 units**

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*\*Courses recommended for elementary school teaching pathway and must be approved by geology advisor. Students not in elementary school teacher path cannot receive credit for BIOL102 or PHYS/CHEM 102*

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### Elective Related Fields

These are to be taken with adviser approval depending on the student's track (e.g., science education or environmental/policy/resource). They can include, but are not limited to, the following courses. Other course can be taken with geology advisor approval.

#### Department Code

GEOG 312, 323\*, 325, 328, 329, 350, 422, 425, 426, 450, 452, 481, 482, 485, 488

BIOL 151, 274, 300, 305\*, 318, 319, 352, 409\*, 453\*

CHEM 120A\*, 120B, 125, 303A, B, C, 313A, B, C\*

MATH 120, 125, 130, 135, 150A, 150B, 250B

PHYS 120\*, 212, 226, 301

ANTH 344, 403, 404, 409

EGCE 214/L, 305, 324

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**Total: 8 units**

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*\*Courses recommended for elementary school teaching pathway and must be approved by geology advisor.*

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**Undesignated Electives**

Students must take a minimum of 22 additional units in any department to meet the university's total unit requirement of 120 units for the Bachelor of Arts degree. Although a minor is not required for the baccalaureate degree, student may elect to use these additional 22 units to complete one or more minors from those available. In completing the requirement for a minor, a minimum of twelve (12) units, of which at least six (6) must be upper-division, must be distinct and different from the units used to complete the requirement of the major. See the University catalog for the complete rules. Note: These 22 undesignated units do NOT need to be advisor approved.

**Upper-Division Writing Requirement**

Students must take one of the following courses.

Department Code
ENGL 301 or ENGL 360
GEOL 498
<b>Total: 3 units</b>



## BACHELOR OF ARTS IN EARTH SCIENCE

### Sample Course Matrix

#### Freshman Year

Fall Semester	Units	Spring Semester	Units
GEOL 101 or 110T or 140	3-4	GEOL 201	3
GEOL 101L	1	Undesignated Elective	3
MATH 120 or 125 or 130 or 135 or 150A	3-5	CHEM 100/100L or 120A	4-5
GE A.1 Oral Comm (HCOM 100)	3	GE A.3 Critical Thinking (READ 290)	3
GE A.2 Written Comm (ENGL 101)	3	GE C.4 World Civ (HIST 110A)	3
<b>Total</b>	<b>13-16</b>	<b>Total</b>	<b>13-14</b>

#### Sophomore Year

Fall Semester	Units	Spring Semester	Units
GEOL 333	3	GEOL 335	3
Undesignated elective	3		
BIO 101 or 152	3-5	Earth Science Elective	3
GE D.2 World Civ (HIST 110B)	3	PHY 115 or 221/221L or 225/225L	4-5
GE D.3 American History (HIST 180)	3	GE D.4 American Govt (POSC 100)	3
<b>Total</b>	<b>15-18</b>	<b>Total</b>	<b>13-14</b>

#### Junior Year

Fall Semester	Units	Spring Semester	Units
GEOL 380	3	ENG 301, 360 or GEOL 498	3
Earth Science Elective	3	Earth Science Elective	3
GEOG 110 or 114	3-4	Undesignated elective	3
GE C.1 Art (ART 101)	3	GE C.2 Humanities (PHIL 120)	3
GE D.3 American History (HIST 180)	3	GE Z Cultural Diversity	3
<b>Total</b>	<b>15-16</b>	<b>Total</b>	<b>15</b>

#### Senior Year

Fall Semester	Units	Spring Semester	Units
GEOL 420 or 470	4	Undesignated Elective	3
Earth Science Elective	3	Undesignated Elective	3
Elective Related Fields	3	Elective Related Fields	5
GE C.3 Arts/Hum (ANTHRO 305*)	3	GE D.5 Soc. Sci. Exp. (ANTH 310*)	3
GE D.1 Social Sciences (GEOG 100)	3	GE E Lifelong learning (BIOL 360*)	3
<b>Total</b>	<b>16</b>	<b>Total</b>	<b>17</b>

\*Course may double count towards GE requirements and as BA undesignated electives

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## BACHELOR OF ARTS: EARTH SCIENCES

### Sample Course Matrix for Subject Pathways:

#### ENVIRONMENTAL SCIENCES PATHWAY

<b>Course #</b>	<b>Title</b>	<b>Units</b>	<b>PREREQ'S</b>
BIOL 300	Environmental Biology and Sustainability	3	<i>BIOL 101</i>
BIOL 318	Wildlife conservation	3	<i>One course from GE B.2</i>
BIOL 330	Sustainability ecology: American Indian models		<i>One course from GE B.2</i>
CHEM 303A	Biotechnology: Business and society	3	<i>Completion of GE categories A, B, B.1, B.4</i>
CHEM 303C	Biotechnology: Agricultural and Environmental biotechnology	1	<i>CHEM 303A</i>
CHEM 311	Nutrition and disease	3	<i>CHEM 111 or BIOL 101</i>
CHEM 313A	Environmental pollution and it's solutions: Air Pollution	1	<i>Completion of GE categories A, B, B.3</i>
CHEM 313B	Environmental pollution and it's solutions: Water Pollution	1	<i>Completion of GE categories A, B, B.3</i>
CHEM 313C	Environmental pollution and it's solutions: Land Pollution	1	<i>Completion of GE categories A, B, B.3</i>
EGCE 305	Failure of Building and Structure Due to EQs and after effects	3	<i>One course from GE B.4 or B.1</i>
EGCE 441	Environmental Engineering	3	<i>BIOL 101 or CHEM 115</i>
EGCE 481	Remediation of Contaminated Soil and Groundwater	3	<i>EGCE 441</i>
EGCE 482	Wastewater treatment and Water Reclamation	3	<i>EGCE 441</i>
GEOG 325	Natural Vegetation	3	<i>Completion of GE category B.1 or B.4</i>
GEOG 328	Global change and environmental systems	3	<i>Completion of GE category B.1 or B.4</i>
GEOG 329	Cities and Nature	3	<i>Completion of GE category B.1 or B.4</i>
GEOG 350	Nature and Society	3	<i>Completion of GE category D.1</i>
GEOG 450	Human response to environmental hazards	3	<i>GEOG 110 and at least one 300-level GEOG course, GEOG 350 preferred</i>

EGCE = Civil and Environmental Engineering

BIOL = Biology

CHEM = Chemistry

GEOG = Geography

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## BACHELOR OF ARTS: EARTH SCIENCES

### Sample Course Matrix for Subject Pathways:

#### **BUSINESS PATHWAY**

<b>Course #</b>	<b>Title</b>	<b>Units</b>	<b>PREREQ'S</b>
ACCT 201	Introductory Financial Accounting	3	<i>None</i>
ECON 201	Principles of Microeconomics	3	<i>None</i>
BUAD 210	Understanding Business	3	<i>None</i>
BUAD 301	Advanced Business Communication	3	<i>ENG 101, BUAD 201, ISDS 265( or equivalent) w/ at least a "C"</i>
FIN 320	Business Finance	3	<i>ACCT 201A (COREQ'S: ISDS 361A, BUAD 301)</i>
ISDS 265	Introduction to Information Systems and Applications	3	<i>None</i>
MGMT 340	Organization Behavior	3	<i>General Education in Social Sciences (COREQ'S: BUAD 301, ISDS 361A)</i>
MGMT 461	Entrepreneurial Management	3	<i>ACCT 201A, BUAD 301</i>
MGMT 465A	New Venture Creature and Funding	3	<i>MGMT 339, 340 (COREQ'S: ACCT 463, MGMT 461, 464 or MKTG 462)</i>
MGMT 465B	New Venture Launch	3	<i>MGMT 465A</i>
MKTG 351	Principles of Marketing	3	<i>ECON 202 (COREQ'S: BUAD 301, ISDS 361A)</i>

ACCT = Accounting

BUAD = Business Administration

ECON = Economics

FIN = Finances

ENG = English

ISDS = Information Systems and Decision Sciences

MKTG = Marketing

MGMT = Management

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## BACHELOR OF ARTS: EARTH SCIENCES

### Sample Course Matrix for Subject Pathways:

#### **TEACHING PATHWAY**

<b>Course #</b>	<b>Title</b>	<b>Units</b>	<b>PREREQ'S</b>
BIOL 102	Biology for Future Teachers	3	<i>None</i>
BIOL 305	Human Heredity and Development	3	<i>Completion of G.E. Category B.2</i>
EDSC 304	Educational Technologies for Secondary Teachers	3	<i>None</i>
EDSC 310	The Teaching Experience: Participation	3	<i>None</i>
EDSC 320	Adolescence and Education	3	<i>Completion of G.E. Category D.1</i>
EDSC 330	Developing Literacy in Secondary Schools	3	<i>None</i>
EDSC 340	Diversity in Secondary Schools	3	<i>None</i>
PHYS/CHEM 102	Physical Science for Future Elementary Teachers	3	<i>None</i>

BIOL = Biology

CHEM = Chemistry

EDSC = Secondary Education

PHYS = Physics

# BACHELOR OF ARTS: EARTH SCIENCES

## Sample Course Matrix for Subject Pathways:

### PROFESSIONAL REGISTRATION PATHWAY

Course #	Title	Units	PREREQ'S
GEOL 303A	Earth Materials	4	GEOL 101, 101L, ENGL 101 ( <b>PRE or COREQ's:</b> CHEM 120A, MATH 125 or equivalent)
GEOL 321	Sedimentology and Stratigraphy	4	GEOL 201, GEOL 303A
GEOL 360	Structural Geology	4	GEOL 380, MATH 125
GEOL 380	Field Techniques	3	GEOL 101, 101L, ENGL 101, MATH 115, 125 or an equivalent Math ( <b>PRE or COREQ's:</b> GEOL 201)
GEOL 406	Geochemistry	3	<b>PRE or COREQ's:</b> GEOL 303B, CHEM 120B or 125
GEOL 436	Hydrogeology	3	GEOL 101L, 335 or equivalent, MATH 130 or 150A
GEOL 456	Geophysics	3	MATH 150A or 130, PHYS 225, 225L or 211,212L
GEOL 476	Engineering Geology	3	MATH 130 or 150A, GEOL 380 or EGCE 214, 214L
GEOL 481A	Field Camp	4	GEOL 303B, 321, 335, 360, 380
BIOL 101/101L	Elements of Biology/Lab	3/1	None
CHEM 120A	General Chemistry	5	CHEM 115 or pass the CPE
GEOG 110	Introduction to the Natural Environment	3	Completion of G.E. Category D.1.
GEOG 481	Geographic Information Systems: Introduction	3	None
GEOG 482	Environmental Impact Assessment	3	GEOG 350, 478, or equivalent
GEOG 485	Geographic Information Systems: Principles and Applications	3	GEOG 481 or equivalent
GEOG 486	Environmental Remote Sensing	3	MATH 110
MATH 120	Introduction to Probability and Statistics	3	Passing score on ELM exam or exemption, & three yrs of high school math (two yrs of algebra and one yr of geometry)
MATH 125	Precalculus	5	Passing score on ELM exam or exemption, & three yrs of high school math (two yrs of algebra and one yr of geometry)
PHYS 115	Introductory Physics	4	High school algebra, geometry and intermediate algebra

\*NOTE: Other 400 level GEOL courses would be suitable as well.

# BACHELOR OF ARTS: EARTH SCIENCES

## Sample Course Matrix for Subject Pathways:

### **PALEONTOLOGY**

<b>Course #</b>	<b>Title</b>	<b>Units</b>	<b>PREREQ'S</b>
BIOL 151	Cellular and Molecular Biology	4 units	<i>Eligible to take MATH 115 or higher and eligible to take ENG 101</i>
BIOL 152	Evolution and Organismal Biology Note: this is old BIOL171	4 units	<i>BIOL 151 (Biology has agreed to waive the BIOL151 requirement if GEOL student has CHEM 120A</i>
BIOL 273	Genetics and Molecular Biology	5 units	<i>BIOL 152 and CHEM 120A or MATH 130 or 150A with a "C" or better</i>
BIOL 274	Principles of Physiology and Ecology	5 units	<i>BIOL 152, 273 and CHEM 120A and MATH 130</i>
BIOL 325	Principles of Evolution	3 units	<i>BIOL 152,273, and 274</i>
BIOL 404	Evolution	3 units	<i>BIOL 325</i>
*BIOL 461	Marine Invertebrate Biology	4 units	<i>BIOL 152,273, and 274</i>
*BIOL 474	Natural History of the Vertebrates	4 units	<i>BIOL 152,273, and 274</i>
*BIOL 475	Ichthyology	4 units	<i>BIOL 152,273, and 274</i>
*BIOL 476	Herpetology	4 units	<i>BIOL 152,273, and 274</i>
*BIOL 478	Mammalogy	4 units	<i>BIOL 152,273, and 274</i>
*BIOL 479	Ornithology	4 units	<i>BIOL 152,273, and 274</i>
CHEM 120A	General Chemistry	5 units	<i>CHEM 115 or pass the CPE</i>
GEOG 110	Introduction to the Natural Environments	3 units	<i>Completion of G.E category B1 or B4</i>
GEOL 110T	Dinosaur World	4 units	<i>High school chemistry or physics</i>
GEOL 303A	Earth Materials	4 units	<i>GEOL 101, 101L, ENG 101, CHEM 120A, MATH 125</i>
GEOL 321	Sedimentation and Stratigraphy	4 units	<i>GEOL 201, 303A</i>
GEOL 322	Paleontology	4 units	<i>GEOL 201; BIO</i>
MATH 130	A Short Course in Calculus	4 units	<i>MATH 115 or MATH 125</i>
PHYS 101	Survey of Physics	3 units	<i>None</i>

## MINOR IN GEOLOGICAL SCIENCES

### Details

A total of 20 units must be taken in Geological Sciences. At least 12 units must be upper division and 6 must be taken in residence. All 20 units must be distinct and different from the units used to complete the requirements of your major. Up to 3 units of GEOL 310T may be applied.

## GEOLOGICAL SCIENCES COURSES

**Courses are designated as GEOL in the class schedule**

### **101 Physical Geology (3)**

Prerequisite: high school chemistry or physics, or equivalent. The physical nature of the planet Earth, the genesis of rocks and minerals, erosion processes and their effects. (101 & 101L=CAN GEOL 2)

### **101H Physical Geology (Honors) (3)**

Prerequisite: high school chemistry or physics, or equivalent. The physical nature of the planet Earth, the genesis of rocks and minerals, erosion processes and their effects. (weekend field trips)

### **101L Physical Geology Laboratory (1)**

Pre- or corequisite: Geological Sciences 101, 110T or 140. Laboratory on minerals, rocks, earthquakes, and map and aerial photographic interpretation. (3 hours laboratory or field trip) (101 & 101L=CAN GEOL 2)

### **101LH Physical Geology Laboratory (Honors) (1)**

Corequisite: Geological Sciences 101 or 101H. Laboratory on minerals, rocks, earthquakes, and map and aerial photographic interpretation. (3 hours laboratory and weekend field trips)

### **102 Earth and Astronomical Science for Future Elementary Teachers (3)**

Designated especially for the prospective elementary school teacher, this activity-based course will examine fundamental Earth/astronomical science concepts and the potential impacts of natural hazards on ecosystems on planet Earth.

### **105 Field Experiences in California Geology (1)**

Pre- or corequisite: Geological Sciences 101 or 110T or 140. Students will participate in three field trips that will examine the rich geology of California. Students will read and discuss topical papers

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## DEPARTMENT OF GEOLOGICAL SCIENCES

and make presentations on selected topics. Weekend field trips are required. May be repeated once for credit.

### **110T Topics in Earth Science (4)**

Prerequisites: high school chemistry or physics, or equivalent. Focused study of public interest topics in Earth science. Alternating topics include: dinosaur world; earthquakes and volcanoes. Each course will include integrated labs, lectures and field trips that explore mainstream Earth science issues. (3 hours lecture, 3 hours lab, and field trips.)

### **140 Earth's Atmosphere and Oceans (3)**

Prerequisites: high school chemistry or physics, or equivalent. The composition, structure, and circulation of the Earth's atmosphere and oceans with a general focus on their interactions. Interdisciplinary topics that highlight atmosphere-ocean interactions will include global warming, ice ages, El Nino, Southern California storms activity, and Santa Ana winds. (3 hours lecture, field trips)

### **201 Earth History (3)**

Prerequisites: Geological Sciences 101L. Evolution of Earth as interpreted from rocks, fossils and geologic structures. Plate tectonics provides a unifying theme for consideration of mountain building, evolution of life and ancient environments. (2 hours lecture, 3 hours laboratory, field trips) (CAN GEOL 4)

### **201L Earth History Supplemental Lab (1)**

Prerequisite: Geological Sciences 101L. Corequisite: Geological Sciences 201. Supervised research on topics related to Earth history. Project will result in a term paper and/or web page. (3 hours laboratory, field trips)

### **303A Mineralogy and Introduction to Petrology (4)**

Prerequisites: Geological Sciences 101L, Chemistry 120A; Prerequisite or co-requisite: Geological Sciences 201. Crystallography; origin, occurrence, composition and identification of minerals with emphasis on minerals in rocks. (2 hours lecture, 6 hours laboratory, field trips)

### **303B Igneous and Metamorphic Petrology (4)**

Prerequisites: Chemistry 120B or 125; Geological Sciences 303A, 380. Description, classification, occurrence and origin of igneous and metamorphic rocks. (2 hours lecture, 6 hours laboratory, field trips)

### **305 Earthquake Impact on Structures (3)**

(Same as Civil and Environmental Engineering 305)



**310T Topics in California-Related Geology (1-3)**

Prerequisites: completion of one course each from General Education Categories III.A.1 and III.A.2. Directed investigations of one aspect of earth science. Alternating topics are: geology of national parks, California geology, ocean off California, California earthquakes, geological hazards of California, and California gems and minerals. May be repeated for credit with a different topic. (3 hours lecture for 5, 10, or 15 weeks; optional field trip)

**321 Sedimentation and Stratigraphy (4)**

Prerequisites: Geological Sciences 201, 303B, and 380. Study of sedimentary rocks including classification, texture, mineralogy and provenance; introduction to sedimentary environments and interpretation of ancient environments in the rock record; study of stratigraphic methods and patterns. (2 hours lecture, 6 hours laboratory, field trips)

**322 Paleontology (3)**

Prerequisites: Geological Sciences 201; Biology 101 or 171 or equivalent. Exploration of paleontology, including evolution, taxonomy, ichnology, biostratigraphy, taphonomy, mass extinctions, and paleoecology. Review of the major fossil groups. (2 hours lecture, 3 hours laboratory, field trips)

**333 General Oceanography (3)**

Prerequisites: Geological Sciences 101L and upper-division standing. The chemical, physical and geological nature of the oceans. (2 hours lecture, 3 hours laboratory, field trips)

**335 Hydrology and Surface Processes (3)**

Prerequisites: Geological Sciences 101 or equivalent, or completion of General Education Category III.A.2. This class explores the impact of surface water on the formation of soils, weathering, surface features (rivers) and groundwater. Application of hydrology as a predictive and postdictive tool on geologic, biotic, and engineering problems.

**355 Earth's Interior (3)**

Prerequisites: Geological Sciences 101; Mathematics 150A; Physics 225, 225L or 211, 211L; Chemistry 120A or equivalent. Geophysical, geochemical properties of mantle and core. Data collection techniques. Impact of internal processes on crustal/surface phenomena.

**360 Structural Geology (4)**

Prerequisites: Geological Sciences 380; Mathematics 125. Faults, folds, mechanics of rock deformation, and elementary tectonics; solution of problems by geometric, trigonometric and stereographic analysis. (3 hours lecture, 3 hours laboratory, field trips)

**376 Engineering Geology (3)**

Prerequisites: Mathematics 130 or 150A; Geological Sciences 380 or EGCE 214 and 214L. Geology applied to engineering works. Earth materials, processes; site evaluation techniques; geologic hazard analysis; case histories. (2 hours lecture, 3 hours laboratory, field trips)

**380 Geologic Field Techniques (3)**

Prerequisites: Geological Sciences 201; English 101; Mathematics 115 or 125 or equivalent. Use of basic geologic field equipment including the Brunton compass and GPS. In-class and weekend field projects will include: basic geologic mapping on topographic maps and aerial photographs; note taking methods in the field; field data interpretation; preparation of geologic maps for reports; preparing stratigraphic columns and geologic cross-sections; and technical report writing. (2 hours lecture, 6 hours field, weekends)

**404 Optical Mineralogy and Petrography (3)**

Prerequisites: Geological Sciences 303B. Principles of optical mineralogy. Use of petrographic microscope to analyze minerals and textures of igneous, metamorphic, and sedimentary rocks. (1 hour lecture, 6 hours laboratory, field trip)

**406 Geochemistry (3)**

Pre or corequisites: Geological Sciences 303B, Chemistry 120B or 125, Mathematics 130 or 150A. Basic chemical and thermodynamic principles applied to the origin and alteration of igneous, sedimentary and metamorphic rocks and economic mineral deposits.

**410 Physical Science Concepts (3)**

Prerequisite: completion of general education natural science requirements or consent of instructor. For elementary school teachers. Major concepts in the physical sciences. Observing, classifying, recognizing space-time relations, measuring, inferring, formulating hypotheses, controlling variables and interpreting data. (2 hours lecture, 2 hours activity)

**420 Earth Science for Science Teachers (4)**

Prerequisites: Geological Sciences 101 and 101L plus upper-division standing or science teaching credential. Major concepts of the earth sciences with primary emphasis on physical and planetary geology and secondary emphasis on meteorology and oceanography. (3 hours of lecture, 3 hours of laboratory, field trips)

**436 Hydrogeology (3)**

Prerequisites: Geological Sciences 101L and 335 or equivalent; Mathematics 130 or 150A. Occurrence, movement and utilization of groundwater resources; geological, geophysical and hydrological methods for groundwater exploration and development. Well hydraulics and groundwater contamination. (2 hours lecture, 3 hours laboratory, field trips)

**455 Earthquake Seismology (3)**

Prerequisites: Geological Sciences 101; Physics 225, 225L or 211, 211L, Mathematics 130 or 150A. Seismic waves, their recording and measurement. Estimation of earthquake source strength, location and mechanism. Introduction to seismic risk and strong motion studies. (3 hours lecture, field trips)

**456 Geophysics (3)**

Prerequisites: Mathematics 150B or 337 or 338; Physics 225, 225L or 211, 211L; Physics 226, 226L or 212, 212L recommended. Seismic refraction, gravity, magnetic and electrical techniques and fundamentals as applied to determination of subsurface structure, groundwater and location of mineral resources. (2 hours lecture, 3 hours laboratory, field trips)

**470 Environmental Geology & Planning (4)**

Prerequisites: Geological Sciences 101L or 420. Geologic processes, hazards, mineral and energy resources and their interaction with planning and environmental regulations. (3 hours lecture, 3 hours lab, field trips)

**475 Quaternary Tectonics (3)**

Prerequisites: Geological Sciences 360 and 380. Study of the processes and products of relatively young Quaternary tectonics. Evaluation of surface tectonic features, their ages, deformation styles, and structural regimes. Assessment of past and contemporary deformation rates. (2 hours lecture, 2 hours activity, field trips)

**481A Geology Field Camp I (4)**

Prerequisites: Geological Sciences 303B, 321, 360, and 380. Advanced geologic mapping in a variety of geologic settings. Field report, map and cross-sections required. Instructional fee required. (45 hours per week for four weeks during intersession or summer)

**481B Geology Field Camp II (3)**

Prerequisites: Geological Sciences 380 and consent of instructor. Advanced geologic field work in a variety of geologic settings. Field report, map and cross-sections required. Instructional fee required. (45 hours a week for three weeks during summer)

**481C Hydrology and Engineering Geology Field Camp (4)**

Prerequisites: Geological Sciences 376, 380 and 436. Geologic mapping and hydrologic mapping and techniques applied to integrated hydro-geologic model for selected areas. Field report(s), map(s), cross-sections required. Instructional fee required. (45 hours per week for three weeks during summer)

**493 Directed Studies (1-3)**

Prerequisites: upper-division standing and consent of instructor. Directed studies in specialized areas of the geological sciences, such as petroleum geology, sedimentology, optical and instrumentation techniques. Library research and written reports required. May be repeated once with a different topic. Not available for M.S. Geology graduate credit.

**495 Geological Sciences Internship (3)**

Prerequisite: junior or senior standing in geological sciences. Geological sciences work experience, salaried or volunteer, with industry, government or private agencies. Student intern will be supervised by faculty adviser and employer. (1 hour of seminar per week plus a total of 120-150 hours of work experience)

**496L Geological Sciences Tutorial (2)**

Prerequisite: 20 units in geological sciences. Supervised experience in geological sciences teaching through tutoring or assisting in laboratory or field classes.

**498 Undergraduate Thesis (3)**

Prerequisite: submission of a thesis proposal, signed by thesis advisor. Developed as an extension of an advanced course, conducted independently by the student under faculty supervision, culminating in a paper of professional quality. Two units maximum credit permitted.

**499L Independent Study (1-3)**

Independent study of a topic selected in consultation with and completed under the supervision of the instructor.

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## ADMINISTRATIVE OFFICES

### The life blood of our department

Our front office and department staff are well known for their helpfulness and hospitality. Make sure you introduce yourself when you go in.

Name	Title	Phone	Email	Office
Davis, Kathleen	Administrative Support Assistant	657-278-4368	<a href="mailto:katdavis@fullerton.edu">katdavis@fullerton.edu</a>	MH 254
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## FACULTY ROSTER

### Full-Time Faculty

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Stratigraphy

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# FAQ

## University Regulations

Each student is responsible for meeting the requirements printed in the University catalog and all published regulations of the University. The following is an abbreviated list of regulations. See the university catalog for a full listing of regulations ([www.fullerton.edu/catalog](http://www.fullerton.edu/catalog)).

### INCOMPLETE POLICY – ALL STUDENTS

Revised 09/03/13

**1. *If the student receives an 'I' (Incomplete) in a class, should he/she sign up for it again to finish the class?***

No  
Completing a class in which the student currently has an 'I' does not involve registering for the class a second time.

**2. *What happens if a student signs up again for a class in which he/she has an 'I'?***

The system will not allow the student to re-enroll in a course in which he/she has an 'I' until the 'I' has either been changed by the course professor to a letter grade, or the 'I' has automatically converted to an 'IC'.

**3. *What is an 'IC'?***

An 'IC' means "Incomplete Charged" and is equivalent to an 'F' in the GPA calculation. An 'I' converts automatically to an 'IC' if the student has not fulfilled course requirements in the two semesters (one calendar year) that immediately follow the semester in which he/she was assigned the 'I', whether or not the student is enrolled at CSUF during those semesters.

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## UNDERGRADUATE REPEAT POLICY

Revised 09/09/13

### **1. Is there a maximum number of units a student can repeat?**

GRADE FORGIVENESS	GRADES AVERAGED
16 units maximum (at CSUF) (for entire CSUF record)	12 units maximum (at CSUF) (from Fall 2009 forward)
The unit limits in each of the two repeat categories listed above, when considered together, comprise the <b>MAXIMUM 28-UNIT REPEAT LIMIT</b>	

### **2. What is the difference between repeats with Grade Forgiveness and repeats with Grades Averaged?**

GRADE FORGIVENESS	GRADES AVERAGED
The GPA calculation is adjusted to remove the effect of the initial grade and include only the repeated grade (with both grades remaining listed on the academic record).	The GPA calculation includes the grades of both takes of the class (with both grades remaining listed on the academic record).

### **3. Is this repeat policy something new?**

GRADE FORGIVENESS	GRADES AVERAGED
<p>No</p> <p>A repetition of course policy involving a limit on forgiveness-type repeats is not new to CSUF:</p> <ul style="list-style-type: none"><li>• A 16-unit repeat limit on forgiveness-type repeats has been in effect for many years and remains in place.</li><li>• This policy does not grant a "new" 16 units of Grade Forgiveness for students.</li><li>• The policy continues to count all courses taken and repeated at CSUF against a 16-unit limit for this type of repeat.</li><li>• Only the name used for this policy (Grade Forgiveness) is new.</li></ul>	<p>Yes</p> <p>Beginning with the Fall 2009 semester, a new 12-unit limit on repeats with Grades Averaged was implemented. In the past, a student could repeat classes that did not come under the 16-unit limit on forgiveness-type repeats as often as needed. Undergraduate students are now limited to a maximum of 12 units of repeated coursework with Grades Averaged, from Fall 2009 forward.</p>



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## UNDERGRADUATE WITHDRAWAL POLICY

Revised 09/03/13

### **1. Is there a limit on the number of units a student can withdraw from?**

Yes  
Undergraduate students (including students pursuing a second bachelor's degree) have a maximum of 18 units of 'W' (withdrawal) at CSUF.

### **2. Is the 18-unit 'W' limit something new?**

Yes  
There was no previous limit.

### **3. If a student has 'W's on the CSUF record before Fall 2009, will they count toward the withdrawal limit?**

No  
'W's on the CSUF record prior to the policy change will remain on the student's record, but will not be counted towards the unit limit. When this policy was implemented in Fall 2009, all undergraduate students began with 18 units of 'W' to use from Fall 2009 forward, regardless of the number of 'W's on record prior to Fall 2009.

### **4. If a student has 'W's on record from courses taken at other colleges, do they count toward the withdrawal limit?**

No  
The 'W's included in the 18-unit limit are only those on the CSUF record, beginning with Fall 2009.

### **5. While attending CSUF, if a student takes a class at another college, which results in a 'W', does that count?**

No