

# Earth and Environmental Sciences

## Bachelor of Science Degree Requirements

	Units
<i>Geology Major</i>	
<b>Major requirements .....</b>	<b>44-45</b>
Lower-division requirements	
GEOL 1 or 15, 12 and 13	
concurrently, 30 ..... (10-11)	
Upper-division requirements	
GEOL 100, 101, 102, 104,	
106, 107, 108A, 108B; two	
of the following: GEOL	
105, 110, 122 ..... (28)	
Upper-division geology	
electives (see <i>Note 2</i> ) ..... (6)	
<b>Additional requirements .....</b>	<b>29-30</b>
CHEM 1A, 1B; MATH 75;	
MATH 76 or GEOL 177	
and one of MATH 77,	
GEOL 180 or C SCI 101;	
PHYS 2A, 2B	
<b>Remaining General Education .....</b>	<b>45*</b>
<b>Electives and remaining</b>	
<b>degree requirements .....</b>	<b>4-6</b>
(see <i>Degree Requirements</i> ); may	
be used toward a minor	
<b>Total .....</b>	<b>124</b>

\* Of the 51 required General Education units, 6 units will be satisfied by the following two courses in additional requirements: 3 units of CHEM 1A in G.E. Breadth B1 and 3 units of MATH 75 in G.E. Foundation B4. Consult the department chair or faculty adviser for details.

### Advising Notes

1. "Additional requirements" courses may be applied to satisfy requirements of General Education, or a minor, as appropriate. They also may be taken *CR/NC* (see *Credit/No Credit Grading*).
2. No more than 1 unit of GEOL 160 may be used to fulfill the upper-division elective requirement. GEOL 154, 155, and 168 are not applicable toward geology major requirements.
3. No General Education Integration course offered by the Department of Earth and Environmental Sciences may be used to satisfy the General Education requirements for geology majors.
4. *CR/NC* is not permitted in the geology major with the exception of GEOL 3, 30, and 160.
5. No more than 1 unit of GEOL 3 will be permitted.
6. General Education and elective units may be used toward a dual major or minor (see *Dual Major* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.

## Geology Minor

The minor consists of 20 units of coursework approved by a departmental faculty member and must include 6 upper-division units in residence. Minimum GPA is 2.0.

## Bachelor of Arts in Natural Sciences

### *Earth Science Option*

The B.A. in Natural Sciences is designed primarily to meet the needs of students interested in pursuing a teaching career in the sciences at the secondary level. Students interested in satisfying the waiver program in the natural sciences should consult an appropriate adviser in their academic program. Contact either the Department of Earth and Environmental Sciences or the Office of the Dean, College of Science and Mathematics.

The degree is also a suitable choice for students with a general interest in earth science and interest in pursuing a career in environmental science, law, medicine, dentistry, optometry, and other areas for which the breadth of scientific coverage of this degree is advantageous.

For a full description of the degree, including all of the emphases, see the *Natural Science Interdisciplinary Courses* section in this catalog. The B.A. in Natural Sciences with the Earth Science Emphasis is as follows:

	Units
<b>Core requirements .....</b>	<b>37-38</b>
<i>Biology</i> <sup>1</sup> .....	(12-13)
BIOSC 1A or BIOL	
15 <sup>1</sup> , BIOC 1B,	
BIOSC 130	
<i>Chemistry</i> .....	(10)
CHEM 1A, 1B	
<i>Geology</i> <sup>1</sup> .....	(8)
GEOL 1 and 3 (or 15),	
GEOL 168	
<i>Natural Science</i> .....	(3)
N SCI 106	
<i>Physical Science</i> .....	(4)
P SCI 21	
<b>Earth Science Option .....</b>	<b>47</b>
CHEM 8 or P SCI 168 .....	(3)
PHYS 2A, 2B <sup>2</sup> .....	(8)
MATH 70 or 75 .....	(4)
GEOL 12, 30, 100, 101, 102,	
105, 106, 112, 155 .....	(26)
Select two courses:	
GEOL 110, 114, 117,	
124; GEOG 111 .....	(6)
<b>General Education .....</b>	<b>51</b>
<b>Total</b> <sup>3,4</sup> .....	<b>126</b>

## Advising Notes for the Natural Sciences Major

1. BIOL 15 and GEOL 15 are part of the Humans and the Natural Environment Cluster. See the *Natural Science Interdisciplinary Courses* section in this catalog. GEOL 15 is equivalent to GEOL 1 and 3.
2. Substitutions may be made with the permission of the appropriate department chair. PHYS 4A-B-C with labs 4AL, 4BL is recommended instead of PHYS 2A-B for those students well prepared for physics.
3. This total assumes that students in this option will maximize the 12 units required for the major that also may be applied to fulfill General Education requirements as follows: CHEM 1A (3 units), BIOSC 1A or BIOL 15 (3 units), GEOL 168 (3 units), and MATH 75 (3 units). Consult your major adviser for details.
4. Students should be sure to take sufficient upper-division units in their General Education courses and electives to satisfy the graduation requirements of 40 upper-division units and Upper-division Writing Skills.

## B.S. in Environmental Sciences\*

This special interdisciplinary program leads to a B.S. in Environmental Sciences jointly conferred by California State University, Fresno and UC Riverside. Qualified students admitted into this program are concurrently registered at both universities but pay student fees only to the campus where they are in residence. There are minimum residence requirements by both universities. Students can take courses at both campuses in person or through distance learning. The B.S. in Environmental Sciences has three degree options: (1) earth science, (2) life science, and (3) behavioral, policy, and health sciences. The curriculum is designed to provide an interdisciplinary education in life, physical, or social sciences directed towards the understanding and the solution of today's environmental problems. For further information call Dr. John Suen, Earth and Environmental Sciences Department, (559) 278-7888 or (559) 278-3086.

\*Approval pending. The B.S. in Environmental Sciences is jointly conferred with UC Riverside.

## Graduate Program

The Department of Earth and Environmental Sciences offers graduate courses of instruction and research leading to the Master of Science degree. The graduate