

## Earth and Environmental Sciences

**High School Preparation.** Adequate high school preparation for a major in geology will facilitate the progress of students through our program. This preparation should include: algebra (2 years), plane and solid geometry, trigonometry, chemistry, physics or biology, and English (4 years).

### Faculty

Stephen D. Lewis, *Chair*  
Robert G. Dundas  
Christopher J. Pluhar  
Keith D. Putirka  
Mathieu Richaud  
C. John Suen  
Peter K. Van de Water  
John Wakabayashi  
Zhi (Luke) Wang  
John J. Anglen, *Lecturer*  
Kerry Workman-Ford, *Lecturer*

### Bachelor of Science Degree Requirements

<i>Geology Major</i>	<i>Units</i>
<b>Major requirements</b> .....	<b>49</b>
Lower-division requirements	
EES 1, 2, 12, and 30.....(12)	
Upper-division requirements	
EES 100, 101, 102, 104, 106, 107, 178, 199; two of the following: EES 105, 110, 122 ; one of the following: EES 114, 117, 118, 124.....(34)	
Upper-division geology elective (see <i>Note 2</i> ).....(3)	
<b>Additional requirements</b> .....	<b>22</b>
CHEM 1A, 1B; MATH 75; PHYS 2A, 2B	
<b>Remaining General Education requirements</b> .....	<b>45*</b>
<b>Electives and remaining degree requirements</b> .....	<b>4</b>
Upper-division writing skills; (see <i>Degree Requirements</i> ); may be used toward a minor	
<b>Total</b> .....	<b>120</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 EES 160 may be used to fulfill the upper-division elective requirement. EES 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 EES 3, 30, and 160.
5. No more than 1 unit of EES 3 will be permitted.
6. General Education and elective units may be used toward a double major or minor (see *Double Major* or departmental minor). Consult the appropriate department chair, program coordinator, or faculty adviser for further information.
7. Students planning to pursue graduate study in geology are strongly encouraged to take MATH 76 or EES 177.

### Bachelor of Science Degree Requirements

<i>Environmental Sciences Major</i>	<i>Units</i>
<b>Lower-division core requirements</b> .....	<b>50-51</b>
<i>Biology</i> : BIOL 1A, 1B.....(9)	
<i>Chemistry</i> : CHEM 1A, 1B.....(10)	
<i>Environmental Sciences</i> :	
EES 4 <sup>1</sup> , 12.....(7)	
<i>Earth Science</i> : EES 1, 30.....(6)	
<i>Mathematics</i> : MATH 75 and select one: MATH 76, 101; PSYCH 42 <sup>2</sup> ; EES 177.....(7-8)	
<i>Physics</i> : PHYS 2A and 2B; or 4A <sup>3</sup> , 4AL, 4B, 4BL.....(8)	
<i>Social Science</i> : PLSI 71.....(3)	
<b>Upper-division requirements</b> .....	<b>24</b>
<i>Biology</i> : BIOL 101.....(3)	
<i>Environmental Sciences</i> :	
EES 100A, 100B, 199.....(9)	
<i>Geology</i> : EES 105, 186, and select one: EES 113, 117, 124.....(9)	
<i>Social Science</i> : PSYCH 173 or ECON 117 <sup>4</sup> .....(3)	
<b>Controlled electives</b> .....	<b>9</b>
<i>Biology/Chemistry</i> : CHEM 8.....(3)	
<i>Earth Science</i> : EES 102, 110, 113, 114, 117, 124.....(6)	
<b>Remaining General Education requirements</b> .....	<b>36-39</b>
<b>Electives</b> .....	<b>0-1</b>
<b>Total</b> .....	<b>120</b>

<sup>1</sup> Requires G.E. Foundation B4 as prerequisite.

<sup>2</sup> PSYCH 42 is prerequisite for BIOL 101.

<sup>3</sup> Requires MATH 77 as prerequisite or may be taken concurrently.

<sup>4</sup> Prerequisite for ECON 117 waived for environmental sciences majors.

### Advising Notes

1. Program satisfies 15 of the 51 required G.E. units if PSYCH 173 is taken.
2. Students interested in physical aspects of environmental sciences should take MATH 76 or EES 177 in addition to PSYCH 42.

### Joint Bachelor of Science Degree Requirements in Environmental Sciences

This special interdisciplinary program leads to a B. S. in Environmental Sciences jointly conferred by California State University, Fresno and the University of California at Riverside. Qualified students admitted into this program are concurrently registered at both universities and both universities have minimum residence requirements. 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 sciences, (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.

Student plans of study require approval by an assigned faculty adviser.

The program offers three degree options: (1) Earth Science (ES) option, (2) Life Science (LS) option, (3) Behavioral, Policy, and Health Sciences (BPHS) option. Environmental Policy, Environmental Study, and Socio-Behavioral Analysis are three emphases within the BPHS option.

<i>Environmental Sciences Major</i>	<i>Units</i>
<b>Lower-division core requirements</b> .....	<b>45-46</b>
<i>Biology</i> .....(9)	
BIOL 1A, 1B	
<i>Chemistry</i> .....(10)	
For ES and BS options, CHEM 1A, 1B	
For BPHS option, CHEM 3A, 8, 150	
<i>Earth and Environmental Sciences</i> .....(8)	
EES 1; UCR ENSC 1, 2	