Environmental Sciences

Bachelor of Science (BS)
The environmental sciences (ES) major is designed for students interested in studying environmental problems from a scientific perspective. The ES major prepares students to deal with issues arising from the impact of human interaction on natural systems. To address these problems, all ES students acquire strong backgrounds in math, biological sciences, and physical sciences. Students may choose to specialize further in a biological or physical science field such as ecology, conservation biology, toxicology, geology, hydrology, meteorology, engineering, or a social science field such as planning, policy analysis, economics, environmental justice, or education. Each ES student completes a year-long senior research project with the support of a mentor in a biological, physical, or interdisciplinary research area.

Graduates are well-prepared for careers in fields such as environmental consulting, education, health, or law as well as community, urban, or regional planning and other related areas of environmentalism in public agencies, non-profit conservation organizations, and private companies. Graduates are well-qualified for a variety of graduate programs, including environmental policy and management, law school, medical school (and other pre-health programs), and environmental engineering.

Admission to the Major
Advice on admission for freshmen and transfer students can be found on the CNR Admissions Guide (http://guide.berkeley.edu/undergraduate/colleges-schools/natural-resources/#admissionstext) page or the CNR Prospective Student website (https://nature.berkeley.edu/prospective-students). Freshman students may apply directly to the major, or they may select the College of Natural Resource's undeclared option and declare the major by the end of their fourth semester. Transfer students may apply directly to the major through the UC application.

Information for current Berkeley students who would like to declare the major after admission, including information on a change of major or change of college, please see chapter 6 of the College of Natural Resources Undergraduate Student Handbook (https://nature.berkeley.edu/handbook). (https://nature.berkeley.edu/handbook)

Honors Program
Students with a GPA of 3.6 or higher may enroll in the College of Natural Resources honors program once they have reached upper division standing. To fulfill the program requirements, students design, conduct, and report on an individual research project working with a faculty sponsor. Qualified ES students enroll in ESPM H175A and ESPM H175L fall of their senior year, and ESPM H175B and ESPM H175L spring of their senior year. For further information on the CNR Honors Program, please see the College of Natural Resources website (http://nature.berkeley.edu/site/honors_program.php).

Minor Program
There is no minor program in environmental sciences.

Other Majors Offered by the Department of Environmental Science, Policy, and Management (ESPM)
Conservation and Resource Studies (http://guide.berkeley.edu/undergraduate/degree-programs/conservation-resource-studies) (Major and Minor)
Ecosystem Management and Forestry (http://guide.berkeley.edu/undergraduate/degree-programs/ecosystem-management-forestry) (Major, Forestry Minor)
Molecular Environmental Biology (http://guide.berkeley.edu/undergraduate/degree-programs/molecular-environmental-biology) (Major only)
Society and Environment (http://guide.berkeley.edu/undergraduate/degree-programs/society-environment) (Major only)

Students in this major choose a concentration in biological, physical, or social sciences based on their intended research area, or general area of interest. The specific requirements for each concentration are outlined below.

In addition to the University, campus, and college requirements listed on the College Requirements tab, students must fulfill the below requirements specific to their major program.

General Guidelines
1. All courses taken to fulfill the major requirements below must be taken for graded credit, other than courses listed which are offered on a Pass/No Pass basis only. Other exceptions to this requirement are noted as applicable.
2. All courses taken to fulfill major requirements must be passed with a C- or better letter grade.
3. A minimum cumulative grade point average (GPA) of 2.0 is required.
4. A minimum GPA of 2.0 in upper division major requirements is required.
5. A minimum of 30 upper division units is required in the Environmental Sciences major. 15 of the required upper division units must be taken in the College of Natural Resources.
6. A maximum of 16 units of independent study (courses numbered 97, 98, 99, 197, 198, and 199) may count toward graduation, with a maximum of 4 units of independent study per semester.
7. No more than 1/3 of the total units attempted at UC Berkeley may be taken Pass/No Pass. This includes units in the Education Abroad Program and UC Intercampus Visitor or Exchange Programs.
8. A maximum of 4 units of physical education courses will count toward graduation.

For information regarding residence requirements and unit requirements, please see the College Requirements tab.

Lower Division Requirements for all ES Majors

ESPM Environmental Science Core (select one):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESPM 2</td>
<td>The Biosphere [3]</td>
</tr>
<tr>
<td>ESPM 6</td>
<td>Environmental Biology [3]</td>
</tr>
</tbody>
</table>
Environmental Sciences

ESPM C10 Environmental Issues [4]
ESPM 15 Introduction to Environmental Sciences [3]
ESPM C46 Climate Change and the Future of California [4]

ESPM Social Science Core (select one):
ESPM 5 FROM FARM TO TABLE: FOOD SYSTEMS IN A CHANGING WORLD [4]
ESPM C11 Americans and the Global Forest [4]
ESPM C12/ENGLISH C77 Introduction to Environmental Studies [4]
ESPM C22AC Fire: Past, Present and Future Interactions with the People and Ecosystems of California [4]
ESPM 50AC Introduction to Culture and Natural Resource Management [4]
ESPM 60 Environmental Policy, Administration, and Law [4]

Environmental Economics

Breadth Requirements (two courses):
Select courses from the Seven Course Breadth listing on the College of Letters & Science website.
1 course from the Arts & Literature, Historical Studies, or Philosophy & Values category (3-4 units)
1 course from the Social & Behavioral Science or International Studies category (3-4 units)

Area of Concentration: Choose a concentration in Biological, Physical, or Social Sciences (see below for requirements for each concentration)

Lower Division Requirements by Concentration

Biological Science Concentration

Math (select one calculus sequence):
MATH 16A Analytic Geometry and Calculus
& MATH 16B and Analytic Geometry and Calculus
MATH 1A Calculus
& MATH 1B and Calculus

Chemistry (two courses):
CHEM 1A General Chemistry
& 1AL and General Chemistry Laboratory
CHEM 3A Chemical Structure and Reactivity
& 3AL and Organic Chemistry Laboratory

Biology (two courses):
BIOLOGY 1A General Biology Lecture
& 1AL and General Biology Laboratory
BIOLOGY 1B General Biology Lecture and Laboratory [4]

Physics (one course):
PHYSICS 8A Introductory Physics [4]

Physical Science Concentration

Math (two courses):
MATH 1A Calculus
& MATH 1B and Calculus

Chemistry (two courses):
CHEM 1A General Chemistry
& 1AL and General Chemistry Laboratory

Chemistry (two courses):
CHEM 3A Chemical Structure and Reactivity
& 3AL and Organic Chemistry Laboratory

Math (select one calculus sequence):
MATH 16A Analytic Geometry and Calculus
& MATH 16B and Analytic Geometry and Calculus
MATH 1A Calculus
& MATH 1B and Calculus

Chemistry (two courses):
CHEM 1A General Chemistry
& 1AL and General Chemistry Laboratory
CHEM 3A Chemical Structure and Reactivity
& 3AL and Organic Chemistry Laboratory

Biology (select one biology sequence):
BIOLOGY 1A General Biology Lecture
& 1AL and General Biology Laboratory
BIOLOGY 1B, plus one of the following: INTEGBI 153, INTEGBI 154, ESPM C103, ESPM 111, ESPM 113, ESPM 114, ESPM 115B, or ESPM 116B

Physics (two courses):
PHYSICS 7A Physics for Scientists and Engineers
& PHYSICS 7B Band Physics for Scientists and Engineers, Math 53 strongly recommended for Physics 7B

Social Science Concentration

Math (select one calculus sequence):
MATH 16A Analytic Geometry and Calculus
& MATH 16B and Analytic Geometry and Calculus
MATH 1A Calculus
& MATH 1B and Calculus

Chemistry (two courses):
CHEM 1A General Chemistry
& 1AL and General Chemistry Laboratory
CHEM 3A Chemical Structure and Reactivity
& 3AL and Organic Chemistry Laboratory

Biology (select one biology sequence):
BIOLOGY 1A General Biology Lecture
& 1AL and General Biology Laboratory
BIOLOGY 1B, plus one of the following: INTEGBI 153, INTEGBI 154, ESPM C103, ESPM 111, ESPM 113, ESPM 114, ESPM 115B, or ESPM 116B

Physics (one course):
PHYSICS 8A Introductory Physics [4]

Upper Division Requirements

Statistics (must be completed before spring semester of student’s junior year) 
Select one of the following:
ESPM 173 Introduction to Ecological Data Analysis [3]
PB HLTH 141 Introduction to Biostatistics [5]
PB HLTH 142 Introduction to Probability and Statistics in Biology and Public Health [4]
STAT 131A Statistical Methods for Data Science [4]

Intro to Methods of Environmental Science
ESPM 100ES Introduction to the Methods of Environmental Science [4] (must be taken spring of junior year)

Senior Research Seminar: First Half (select one): 1, 2
ESPM 175A Senior Research Seminar in Environmental Sciences
& ESPM 175L Senior Research Laboratory in Environmental Sciences (must be taken fall of senior year)
Environmental Sciences

Area of Concentration Elective

Select one 3-5 unit elective from area of concentration (see list below)

Additional ES Elective

Select one 2-5 unit elective from any area of concentration (see list below)

1. These four courses must be completed in the sequence listed, beginning the fall semester of the student’s junior year. Students who plan to study abroad or otherwise not continuously enroll at UC Berkeley for their junior and senior years should meet with the ES adviser.

2. The ESPM H175 sequence is for ES students who have an overall 3.6 or above GPA and will enroll in the CNR honors program.

Upper Division Electives by Concentration

Biological Sciences Concentration Electives

CHEM 103 Inorganic Chemistry in Living Systems 3
CHEM 115 Organic Chemistry--Advanced Laboratory Methods 4
CHEM C130/ MCELLBI C100A Biophysical Chemistry: Physical Principles and the Molecules of Life 4
CIV ENG 101 Fluid Mechanics of Rivers, Streams, and Wetlands 3
CIV ENG 107 Climate Change Mitigation 3
CIV ENG 113 Ecological Engineering for Water Quality Improvement 3
CIV ENG 114 Environmental Microbiology 3
EPS/INTEGBI C100/ Communicating Ocean Science 4
GEOG C146
ENE,RES 102 Quantitative Aspects of Global Environmental Problems 4
EPVC C104/ Modeling and Management of Biological Resources [4]
ENVECON C115Satisfies the modeling requirement only if taken Spring 2015 or earlier.
ESPM C157 Data Science in Global Change Ecology [4]

Human Environment Interactions (select one):

ANTHRO 137 Energy, Culture and Social Organization [4]
EPVC 102D Climate and Energy Policy [4]
ESPM 151 Society, Environment, and Culture [4]
ESPM 160AC/ American Environmental and Cultural History [4]
HISTORY 120AC
ESPM 161 Environmental Philosophy and Ethics [4]
ESPM 162 Bioethics and Society [4]
ESPM 163AC/ Environmental Justice: Race, Class, Equity, and SOCIOL 137The Environment [4]
ESPM 166 Natural Resource Policy and Indigenous Peoples [4]
ESPM 168 Political Ecology [4]
ESPM 169 International Environmental Politics [4]
ENE,RES 175 Water and Development [4]
ENE,RES 180 Ecological Economics in Historical Context [3]
ENVECON C101/ Environmental Economics [4] ECON C125
ENVECON 131Globalization and the Natural Environment [3]
ENVECON 140Economics of Race, Agriculture, and the Environment [3]
ENVECON 153Population, Environment, and Development [3]
ENVECON 162Economics of Water Resources [3]
GEOG 130 Food and the Environment [4]
GEOG 138 Global Environmental Politics [4]

Area of Concentration Elective

Environmental Sciences
Environmental Sciences

INTEGBI 156 & 154L
INTEGBI 154
INTEGBI C144
ESPM/EPS C129 Biometeorology
ESPM 131 Soil Microbial Ecology
ESPM 134 Fire, Insects, and Diseases in Forest Ecosystems
ESPM C138/ MCELLBI C114/ PLANTBI C114
ESPM 140 General Entomology
ESPM 144 Insect Physiology
ESPM 146L Medical and Veterinary Entomology Laboratory
ESPM 147 Field Entomology
ESPM C148/ Pesticide Chemistry and Toxicology
ESPM/EINTGBI C149 Molecular Ecology
ESPM 152 Global Change Biology
ESPM 157 Data Science in Global Change Ecology
ESPM 158 Biodiversity Conservation in Working Landscapes
ESPM 162 Bioethics and Society
ESPM 170 Carbon Cycle Dynamics
ESPM 172 Photogrammetry and Remote Sensing
ESPM 173 Introduction to Ecological Data Analysis
ESPM 174 Design and Analysis of Ecological Research
ESPM 181A Fire Ecology
ESPM 184 Agroforestry Systems
ESPM 185 Applied Forest Ecology
ESPM 186 Management and Conservation of Rangeland Ecosystems
ESPM 187 Restoration Ecology
ESPM 188 Case Histories in Wildlife Management
GEOG C146 Communicating Ocean Science
GEOG C148 Biogeography
GEOG/LD ARCH C188 Geographic Information Systems
INTEGBI C100 Communicating Ocean Science
INTEGBI 102L Introduction to California Plant Life with Laboratory
INTEGBI 117LF Medical Ethnobotany Laboratory
INTEGBI 117LF Medical Ethnobotany Laboratory
INTEGBI C144 Animal Behavior
INTEGBI 146LF Behavioral Ecology with Laboratory
INTEGBI C149 Molecular Ecology
INTEGBI 151 Plant Physiological Ecology
& 151L Plant Physiological Ecology Laboratory
INTEGBI 152 Environmental Toxicology
INTEGBI 153 Ecology
INTEGBI 154 Plant Ecology
& 154L Plant Ecology Laboratory
INTEGBI C156 Principles of Conservation Biology
INTEGBI 157LF Ecosystems of California
INTEGBI 158LF Biology and Geomorphology of Tropical Islands
INTEGBI 162 Ecological Genetics
INTEGBI 163 Molecular and Genomic Evolution
INTEGBI 168 & 168L Systemsatics of Vascular Plants and Systematics of Vascular Plants with Laboratory
INTEGBI 173LF Mammalogy with Laboratory
INTEGBI 174LF Ornithology with Laboratory
INTEGBI 175LF Herpetology with Laboratory
LD ARCH 110 Ecological Analysis
LD ARCH C188 Geographic Information Systems
MCELLBI C102 Survey of the Principles of Biochemistry and Molecular Biology
MCELLBI C112 General Microbiology
& C112L General Microbiology Laboratory
MCELLBI C114 Introduction to Comparative Virology
MCELLBI C116 Microbial Diversity
NUSCTX 110 Toxicology
PLANTBI C110L Biology of Fungi with Laboratory
PLANTBI C112 General Microbiology
& C112L General Microbiology Laboratory
PLANTBI C114 Introduction to Comparative Virology
PLANTBI/ MCELLBI C116 Microbial Diversity
PLANTBI 120 & 120L Biology of Algae
& Laboratory for Biology of Algae
PLANTBI 122 Bioenergy
PLANTBI 180 Environmental Plant Biology
PB HLTH 150A Introduction to Epidemiology and Human Disease
PB HLTH 150B Introduction to Environmental Health Sciences
PB HLTH 162A Public Health Microbiology
& PB HLTH 162L Public Health Microbiology Laboratory

Physical Sciences Concentration Electives

ARCH 140 Energy and Environment
ARCH 149 Special Topics in Energy and Environment
CHM ENG 140 Introduction to Chemical Process Analysis
CHM ENG 141 Chemical Engineering Thermodynamics
CHM ENG 142 Chemical Kinetics and Reaction Engineering
CHM ENG 150A Transport Processes
CHM ENG 150B Transport and Separation Processes
CHEM 103 Inorganic Chemistry in Living Systems
CHEM 104A Advanced Inorganic Chemistry
CHEM 104B Advanced Inorganic Chemistry
CHEM 105 Instrumental Methods in Analytical Chemistry
CHEM 120A Physical Chemistry
CHEM 120B Physical Chemistry
CHEM 125 Physical Chemistry Laboratory
CHEM C130/ MCELLBI C100A Biophysical Chemistry: Physical Principles and the Molecules of Life
CHEM 130B Biophysical Chemistry
CHEM 135 Chemical Biology
CHEM/EPS C182 Atmospheric Chemistry and Physics Laboratory
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<th>Course Title</th>
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<td>Fluid Mechanics of Rivers, Streams, and Wetlands</td>
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<td>CIV ENG 103</td>
<td>Introduction to Hydrology</td>
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<td>CIV ENG C106</td>
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<td>CIV ENG 107</td>
<td>Climate Change Mitigation</td>
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<td>CIV ENG 111</td>
<td>Environmental Engineering</td>
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<td>CIV ENG 113</td>
<td>Ecological Engineering for Water Quality Improvement</td>
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<tr>
<td>CIV ENG 115</td>
<td>Water Chemistry</td>
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<td>CIV ENG C116</td>
<td>Chemistry of Soils</td>
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<td>CIV ENG 171</td>
<td>Rock Mechanics</td>
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<td>CIV ENG 173</td>
<td>Groundwater and Seepage</td>
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<td>EPS/INTEGBI C100/ GEOG C146</td>
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<td>EPS 100A</td>
<td>Minerals: Their Constitution and Origin</td>
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<td>EPS 100B</td>
<td>Genesis and Interpretation of Rocks</td>
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<td>EPS 101</td>
<td>Field Geology and Digital Mapping</td>
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<td>Geomorphology</td>
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<td>Geologic Field Studies</td>
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<td>EPS 131</td>
<td>Geochemistry</td>
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<td>EPS C148/ GEOG C145</td>
<td>Geological Oceanography</td>
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<td>EPS C180</td>
<td>Air Pollution</td>
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<tr>
<td>EPS C181/ GEOG C139</td>
<td>Atmospheric Physics and Dynamics</td>
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<td>EPS C182</td>
<td>Atmospheric Chemistry and Physics Laboratory</td>
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<td>ENE,RES C100/ PUB POL C184</td>
<td>Energy and Society</td>
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<td>ENE,RES 102</td>
<td>Quantitative Aspects of Global Environmental Problems</td>
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<td>and Laboratory in Natural Resource Sampling</td>
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<td>ESPM 120</td>
<td>Science of Soils</td>
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<td>ESPM 121</td>
<td>Development and Classification of Soils</td>
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<td>Field Study of Soil Development</td>
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<td>ESPM C128/ CIV ENG C116</td>
<td>Chemistry of Soils</td>
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<td>ESPM/EPS C129</td>
<td>Biometeorology</td>
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<td>ESPM C130/ GEOG C136</td>
<td>Terrestrial Hydrology</td>
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<td>ESPM 131</td>
<td>Soil Microbial Ecology</td>
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<td>ESPM C148/ NUSCTX C114</td>
<td>Pesticide Chemistry and Toxicology</td>
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<td>ESPM 157</td>
<td>Data Science in Global Change Ecology</td>
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<td>ESPM 164</td>
<td>GIS and Environmental Science</td>
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<td>ESPM C170</td>
<td>Carbon Cycle Dynamics</td>
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<td>Photogrammetry and Remote Sensing</td>
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<td>Introduction to Ecological Data Analysis</td>
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<td>ESPM 174</td>
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<td>ESPM/ EPS C180/ CIV ENG C106</td>
<td>Air Pollution</td>
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<td>GEOG C139</td>
<td>Atmospheric Physics and Dynamics</td>
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<td>GEOG 140A</td>
<td>Physical Landscapes: Process and Form</td>
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<td>GEOG 142</td>
<td>Climate Dynamics</td>
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<td>GEOG 143</td>
<td>Global Change Biogeochemistry</td>
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<td>GEOG 144</td>
<td>Principles of Meteorology</td>
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<td>Geological Oceanography</td>
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<td>GEOG 180</td>
<td>Field Methods for Physical Geography</td>
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<td>GEOG 183</td>
<td>Cartographic Representation</td>
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<td>GEOG/LD ARCH C188</td>
<td>Geographic Information Systems</td>
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<tr>
<td>INTEGBI 106A</td>
<td>Physical and Chemical Environment of the Ocean</td>
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<td>LD ARCH 120</td>
<td>Topographic Form and Design Technology</td>
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<td>Geographic Information Systems</td>
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<tr>
<td>MATH 121A</td>
<td>Mathematical Tools for the Physical Sciences</td>
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<td>MEC ENG 106</td>
<td>Fluid Mechanics</td>
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<td>CIV ENG 107</td>
<td>Climate Change Mitigation</td>
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<td>DEMOG/SOCIO C126</td>
<td>Sex, Death, and Data</td>
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<td>DEMOG/ECON C175</td>
<td>Economic Demography</td>
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<td>ECON/ C102</td>
<td>Natural Resource Economics</td>
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<td>ENCON C125/ ENVECON C101</td>
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<td>ENE,RES 100</td>
<td>Energy and Society</td>
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<td>ENE,RES 180</td>
<td>Ecological Economics in Historical Context</td>
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<td>ENGIN 125</td>
<td>Ethics, Engineering, and Society</td>
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<td>ENGIN 157AC</td>
<td>Engineering, The Environment, and Society</td>
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<td>ENVECON 100</td>
<td>Microeconomic Theory with Application to Natural Resources</td>
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<td>ENVECON 101/ ECON C125</td>
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<td>ENVECON C115/ ENVECON 104</td>
<td>Modeling and Management of Biological Resources</td>
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<td>ENVECON C131</td>
<td>Globalization and the Natural Environment</td>
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<td>ENVECON 147</td>
<td>Regulation of Energy and the Environment</td>
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<td>ENVECON C151/ ECON C171</td>
<td>Economic Development</td>
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<tr>
<td>ENVECON 153</td>
<td>Population, Environment, and Development</td>
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</table>
**Undergraduate Breadth**

Undergraduate breadth provide Berkeley students with a rich and varied educational experience outside of their major program and many students complete their breadth courses in their first two years. Breadth courses are built into CNR major requirements and each major requires a different number of breadth courses and categories. The EEP major is the only CNR major that requires the entire 7 course breadth. Refer to the major snapshots on each CNR major page (https://nature.berkeley.edu/advising/majors-minors) for more information.

**High School Exam Credit**

CNR students may apply high school exam credit (Advanced Placement, International Baccalaureate, A-Level Exam) towards many College and Major Requirements. See AP Exam Equivalency Chart and Higher Level IB Exam Equivalency Chart (https://nature.berkeley.edu/advising/courses-grades/#AP%20Exam%20Equivalency%20Chart) in the CNR Student Handbook (https://nature.berkeley.edu/handbook) for more information.

**Units Requirements**

Students must complete at least 120 semester units of courses subject to certain guidelines:

- At least 36 units must be upper division courses, including a minimum of 15 units of upper division courses in the College of Natural Resources.
- A maximum of 16 units of Special Studies coursework (courses numbered 97, 98, 99, 197, 198, or 199) is allowed towards the 120 units; a maximum of four is allowed in a given semester.
- A maximum of 4 units of Physical Education from any school attended will count towards the 120 units.
- Students may receive unit credit for courses graded P (including P/ NP units taken through EAP) up to a limit of one-third of the total units taken and passed on the Berkeley campus at the time of graduation.

**Semester Unit Minimum**

All CNR students must enroll in at least 13 units each fall and spring semester.

**Semester Unit Maximum**

To request permission to take more than 19.5 units in a semester, please see the major adviser.

**Semester Limit**

Students admitted as freshmen must graduate within 8 fall/spring semesters at UC Berkeley. Students admitted as transfer students must graduate within 5 fall/spring semesters at UC Berkeley. Students who go on EAP and UCDC can petition for additional semesters. Summer session, UC Extension and non-UC study abroad programs do not count towards this semester limit. Students approved for double majors or simultaneous degrees in two colleges may be granted an additional 3 semester limits.
semester. CNR does not limit the number of total units a student can accrue.

**Senior Residence Requirement**

After the term in which you achieve and exceed 90 units (senior status), you must complete at least 24 of the remaining 30 units in residence at the College of Natural Resources over at least 2 semesters. To count as residence, a semester must consist of at least 6 passed units taken while the student is a member of CNR. At least one of the two terms must be a fall or spring semester. Senior residence terms do not need to be completed consecutively. All courses offered on campus for the fall, spring, and summer terms by Berkeley departments and programs and all Berkeley external ("W") courses count. Inter-campus Visitor, Education Abroad Program, UC Berkeley Washington Program, and UC Berkeley Extension units do not count toward this requirement.

Students may use Summer Session to satisfy one semester of the Senior Residence Requirement, provided that four units of coursework are completed.

**Modified Senior Residence Requirement**

Participants in a fall, spring or summer UC Education Abroad Program (UCEAP), Berkeley Summer Abroad, or the UC Berkeley Washington Program may meet a modified Senior Residence Requirement by completing 24 of their final 60 semester units in residence (excluding UCEAP). At least 12 of these 24 units must be completed after senior status is reached. International travel study programs sponsored by Summer Sessions and education abroad programs offered outside of the UC system do not qualify for modified senior residence.

Most students automatically satisfy the residence requirement by attending classes here for four years. In general, there is no need to be concerned about this requirement, unless students go abroad for a semester or year or want to take courses at another institution or through University Extension during their senior year. In these cases, students should make an appointment to see an adviser to determine how they can meet the Senior Residence Requirement.

**Grade Requirements**

- A 2.0 UC GPA is required for graduation.
- A 2.0 average in all upper division courses required of the major program is required for graduation.
- A grade of at least C- is required in all courses for the major

**Learning Goals for the Major**

1. Develop a broad, interdisciplinary framework for approaching complex, interconnected environmental problems facing our world at multiple scales.
2. Develop strong analytic and quantitative skills needed to identify problems, develop a program to address the problem, execute a rigorous analysis of the issue, and reach independent conclusions.
3. Develop a rigorous scientific base across multiple disciplines (social, biological, and physical sciences) but with a strong concentration in one area so as to develop depth of expertise in that field.
4. Learn how to communicate findings effectively to the scientific community, government agencies, non-government environmental organizations, and the public.

**Skills**

1. Recognition of and knowledge about environmental problems and areas of research.
2. Comprehensive training in basic mathematics and the biological and physical sciences (calculus, biology, chemistry, and physics).
3. Introduction to the social science concepts and methods (environmental economics, a course in human environment interactions).
4. Training in sampling and experimental design, and quantitative methods of data analysis and interpretation (statistics, introduction to estimation and modeling techniques).
5. Development of critical thinking and evaluation skills.
6. Training in general research methods.
7. Training in written communication, especially scientific writing.
8. Training in oral and visual communication skills.
9. Additional training in specialized research methods in the student’s area of concentration.

In the College of Natural Resources, we provide holistic, individual advising services to prospective and current students who are pursuing major and minors in our college. We assist with a range of issues including course selection, academic decision-making, achieving personal and academic goals, and maximizing the Berkeley experience.

If you are looking to explore your options, or you are ready to declare a major, double major, or minor, contact the undergraduate adviser for your intended major. Visit our website (https://nature.berkeley.edu/advising/meet-cnr-advisors) to explore all of our advising services.

**Undergraduate Advisor, Environmental Sciences**

Ginnie Sadil
envsci.ugrad@berkeley.edu
260 Mulford Hall
510-642-7895
Contact Ginnie via email or visit 260 Mulford Hall to schedule an appointment.

Advising hours: Monday to Friday, 9 to noon and 1 to 4 p.m. Our office is closed from noon to 1 p.m.

**Career Services Overview**

The UC Berkeley Career Center (https://career.berkeley.edu) prepares undergraduates, graduate students, and alumni to make informed decisions about their futures by providing comprehensive resources, programs, and counseling on career development, internships, employment, and graduate school. Whether it be through a resume critique, an alumni networking event, or an interviewing skills workshop, the Career Center is committed to helping all students achieve:

- **Career Clarity**: Providing students the opportunity to identify their career direction
- **Career Competitiveness**: Providing students the opportunities to enhance their marketability via real world experiences
- **Career Connections**: Providing students opportunities to engage with alumni and employers
Common Career Paths for Environmental Sciences Majors

Career Destinations Survey

Every year the Career Center surveys graduating seniors (https://career.berkeley.edu/Survey/Survey) about their post-graduation plans to better understand the career outcomes of our alumni including: career fields, job titles, specific employers, entry-level salaries, and graduate/professional school destinations. The data profiles by major provide an impressive overview of the diverse interests and achievements of recent graduates from UC Berkeley, including specific data for the Environmental Sciences (https://career.berkeley.edu/sites/default/files/pdf/Survey/2015EnvSci.pdf) major within the College of Natural Resources. Each annual data set includes the August, December, and May graduating cohorts for that survey year. This data is designed to provide students, alumni, and employers with critical information about where Cal students go after graduation. As expected, college major does not restrict the employment or graduate school options that Cal students pursue. With careful planning (https://career.berkeley.edu/Plan/Plan), you can develop career-related skills and experiences that can prepare you for almost any job or graduate school field.

Sample Career Pathways

Environmental Sciences majors go on to pursue a wide variety of career options including, but not limited to:

- Federal Government Agencies (e.g. Environmental Protection Agency; Department of Agriculture)/environmental remediation & compliance: soil, water, air & sediments
- Nonprofit Organizations (Environment & Sustainability focused): Administration, management, public relations, fundraising/development, program coordination, grant writing, volunteer management
- Business: Sales (e.g. solar), regulatory/compliance; corporate social responsibility (CSR), environmental consulting
- Waste Management: Risk assessment, quality control, logistics, planning, recycling, transportation, public health
- Air & Water Quality Management: Testing/analysis, watershed management, stream restoration, sustainable infrastructure, risk assessment, compliance/permitting
- Soil Science: Waste disposal, environmental compliance, landfill operation and monitoring, fertilizer technology, agricultural production, research, organic farming
- Planning and Conservation: Natural resource management, sustainability programs, water resources, transportation and aviation planning, building/zoning, land use/acquisition, recreation and parks management, mining
- Education/Environmental Education: Teaching (elementary, secondary, post-secondary, research); public/community education, public health, outdoor education
- Communications: Technical writing, editing, illustrating, photography, public relations
- Health/Medical: Physician, allied health professions, nutrition, alternative medicine
- Environmental Law: Political action/lobbying, regulatory affairs, science policy, patent law, public interest, environmental law, mediation

Visit our Connecting Majors to Careers (https://career.berkeley.edu/InfoLab/Majors2Careers) resource to explore additional career paths most commonly associated with over 80 majors, including Environmental Sciences (http://whatcanidowiththismajor.com/major/wp-content/uploads/2011/05/environmentalstudies-science3.pdf).

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Career and Internship Resources

The UC Berkeley Career Center (https://career.berkeley.edu) offers a wide variety of programs and resources to support students of all majors and class levels.

- Job Search Tools (https://career.berkeley.edu/Tools/Tools): Resume and cover letter writing, job search strategies, networking tools, interviewing skills, and more.
- Career Counseling (https://career.berkeley.edu/Info/MakeAppt): A wide variety of scheduled and drop-in appointment options based on major and topic.
- Internships (https://career.berkeley.edu/Internships/Internships): Internship listings, search strategies, FAQs, and more.
- Career Exploration (https://career.berkeley.edu/Info/CareerExp): Resources to explore career options, identify career goals, and develop effective career plans.
- Events and Workshops (https://career.berkeley.edu/Info/Events): Over 70 events each semester including workshops, alumni networking events, career panels, conferences, and on-campus Career Chats.
- Career Fairs and Employer Information Sessions (https://career.berkeley.edu/Callisto/Infosession): We offer 14 career fairs each year across a variety of career fields and partner with numerous employers for on-campus information sessions.
- Graduate and Professional School (https://career.berkeley.edu/Info/GradProf): Counseling and resources to help students research and apply for graduate and professional school including medical school (https://career.berkeley.edu/Medical/Medical) and law school (https://career.berkeley.edu/Law/Law).

Expand all course descriptions [+Collapse all course descriptions [-]