

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.

For more information, visit the Environmental Sciences webpage (<https://nature.berkeley.edu/advising/majors/environmental-sciences/>).

Admission to the Major

Advice on admission for freshmen and transfer students can be found on the Rausser College of Natural Resources Admissions (<http://guide.berkeley.edu/undergraduate/colleges-schools/natural-resources/#admissionstext>) page or the Prospective Students (<https://nature.berkeley.edu/prospective-students/>) page. Freshman students may apply directly to the major, or they may select the college's undeclared option and declare the major by the end of their fourth semester. Transfer students (<https://nature.berkeley.edu/advising/transfer-applicants/>) may apply directly to the major through the UC application and must meet the minimum requirements outlined in the Transfer Admission Guidelines (<https://nature.berkeley.edu/sites/default/files/ES%20Transfer%20Admission%20Guidelines.pdf>).

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 our change of major or college (<https://nature.berkeley.edu/advising/choosing-major/>) webpage. (<https://nature.berkeley.edu/handbook/>)

Honors Program

Students with a GPA of 3.6 or higher are eligible to earn honors in the Environmental Sciences major. For additional details, please visit the Honors Program (<https://nature.berkeley.edu/advising/honors-program/>) website. 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. In this course series, students design, conduct, and report on an individual research project working with a faculty sponsor.

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. Please see the ES Major Snapshot (https://docs.google.com/document/d/15nsiH5SenQCdyiyku_pHPEcay78wgg2HTI2mV5Au-oA/edit/) for an overview.

General Requirements

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):

ESPM 2	The Biosphere [3]
ESPM 6	Environmental Biology [3]
ESPM C10	Environmental Issues [4]
ESPM 15	Introduction to Environmental Sciences [3]
ESPM C46	Climate Change and the Future of California [4]
L & S 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 C22AC/ ANTHRO C12AC	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 C52	History of Native American Land, Colonialism, and Heritage Preservation 3
ESPM 60	Environmental Policy, Administration, and Law [4]

Environmental Economics:

ENVECON C1/ECON C3	Introduction to Environmental Economics and Policy [4]
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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 & MATH 16B	Analytic Geometry and Calculus and Analytic Geometry and Calculus
MATH 1A & MATH 1B	Calculus and Calculus

Chemistry (two courses):

CHEM 1A & 1AL	General Chemistry and General Chemistry Laboratory
CHEM 3A & 3AL	Chemical Structure and Reactivity and Organic Chemistry Laboratory

Biology (two courses):

BIOLOGY 1A & 1AL	General Biology Lecture and General Biology Laboratory
BIOLOGY 1B	General Biology Lecture and Laboratory [4]

Physics (one course):

PHYSICS 8A	Introductory Physics [4]
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Physical Science Concentration

Math (two courses):

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

CHEM 1A & 1AL	General Chemistry and General Chemistry Laboratory
CHEM 3A & 3AL	Chemical Structure and Reactivity and Organic Chemistry Laboratory

Biology (select one biology sequence):

BIOLOGY 1A & 1AL	General Biology Lecture and General Biology Laboratory
BIOLOGY 1B	General Biology Lecture and Laboratory
BIOLOGY 1B	plus one of the following: INTEGBI C153, INTEGBI 154, ESPM C103, ESPM 111, ESPM 113, ESPM 114, ESPM 115B, ESPM 116B, or ESPM 152

Physics (two courses):

PHYSICS 7A & PHYSICS 7B	Physics for Scientists and Engineers and Physics for Scientists and Engineers (Math 53 strongly recommended for Physics 7B)
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Social Science Concentration

Math (select one calculus sequence):

MATH 16A & MATH 16B	Analytic Geometry and Calculus and Analytic Geometry and Calculus
MATH 1A & MATH 1B	Calculus and Calculus

Chemistry (two courses):

CHEM 1A & 1AL	General Chemistry and General Chemistry Laboratory
CHEM 3A & 3AL	Chemical Structure and Reactivity and Organic Chemistry Laboratory
	or CHEM 1B General Chemistry

Biology (select one biology sequence):

BIOLOGY 1A & 1AL	General Biology Lecture and General Biology Laboratory
BIOLOGY 1B	General Biology Lecture and Laboratory
BIOLOGY 1B	plus one of the following: INTEGBI C153, INTEGBI 154, ESPM C103, ESPM 111, ESPM 113, ESPM 114, ESPM 115B, ESPM 116B, or ESPM 152

Physics (one course):

PHYSICS 8A	Introductory Physics [4]
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Upper Division Requirements

Statistics (must be completed before spring semester of junior year):

Select one of the following:

EECS 126	Probability and Random Processes [4]
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 C131A	Statistical Methods for Data Science [4]
STAT 133	Concepts in Computing with Data [3]

Intro to Methods of Environmental Science (must be taken spring of junior year):¹

ESPM 100ES Introduction to the Methods of Environmental Science [4]

Senior Research Seminar A (select one, must be taken fall of senior year):¹

ESPM 175A Senior Research Seminar in Environmental & ESPM 175L Sciences and Senior Research Laboratory in Environmental Sciences (must be taken fall of senior year)

ESPM H175A Senior Research Seminar in Environmental & ESPM H175L Sciences and Senior Research Laboratory in Environmental Sciences (must be taken fall of senior year)²

Senior Research Seminar B (select one, must be taken spring of senior year):¹

ESPM 175B Senior Research Seminar in Environmental & ESPM 175L Sciences and Senior Research Laboratory in Environmental Sciences (must be taken spring of senior year)

ESPM H175B Senior Research Seminar in Environmental & ESPM H175L Sciences and Senior Research Laboratory in Environmental Sciences (must be taken spring of senior year)²

Environmental Modeling (select one):³

ENE,RES 102 Quantitative Aspects of Global Environmental Problems [4]

ENE,RES 131 Data, Environment and Society [4]

ESPM 102C Resource Management [4] ^{Satisfies the modeling requirement if taken Spring 2016 or later.}

ESPM C104/ ENVECON C113 Modeling and Management of Biological Resources [4]

ESPM 157 Data Science in Global Change Ecology [4]

Human Environment Interactions (select one):

ANTHRO 137 Energy, Culture and Social Organization [4]

ESPM 102D Climate and Energy Policy [4]

ESPM 151 Society, Environment, and Culture [4]

ESPM 155AC Sociology and Political Ecology of Agro-Food Systems [4] ^{formerly ESPM 155}

ESPM 160AC/ American Environmental and Cultural History [4]
HISTORY 120A/

ESPM 161 Environmental Philosophy and Ethics [4]

ESPM 162 Bioethics and Society [4]

ESPM C162A/ Health, Medicine, Society and Environment [4]
ANTHRO C119A

ESPM 163AC/ Environmental Justice: Race, Class, Equity, and SOCIOL 137A(the Environment [4]

ESPM C167/ Environmental Health and Development [4]
PB HLTH C160

ESPM 168 Political Ecology [4]

ESPM 169/ International Environmental Politics [4]
W169

ESPM C176 CLIMATE JUSTICE [4]

ESPM 186 Grassland and Woodland Management and Conservation [4]

ENE,RES C16C CLIMATE JUSTICE [4]

ENE,RES 170 Environmental Classics [3]

ENE,RES 171 California Water [3]

ENE,RES 175 Water and Development [4]

ENE,RES 180 Ecological Economics in Historical Context [3]

ENVECON Environmental Economics [4]
C101/
ECON C125

ENE,RES C192 Business, Sustainability, and Society [3]

ENVECON 131 Globalization and the Natural Environment [3]

ENVECON 140 Economics of Race, Agriculture, and the Environment [3]

ENVECON 153 Population, Environment, and Development [3]

ENVECON 162 Economics of Water Resources [3]

GEOG 130 Food and the Environment [4]

GEOG 138 Global Environmental Politics [4]

PB HLTH 150B Human Health and the Environment in a Changing World [3]

Area of Concentration Elective:

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

Additional ES Elective:

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

¹ These three courses must be completed in the sequence listed, beginning the spring semester of the student's junior year. Statistics must be completed before starting this series. 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 advisor.

² The ESPM H175 sequence is for ES students who have an overall 3.6 or above GPA and want to participate in the Rausser College Honors Program.

³ Recommended to be completed before senior year. ESPM C183/EEP C183 satisfies the modeling requirement only if taken Spring 2015 or earlier.

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 107	Climate Change Mitigation	3
CIV ENG 113	Ecological Engineering for Water Quality Improvement	3
CIV ENG 114	Environmental Microbiology	3
ENGIN/IAS 157AC	Engineering, The Environment, and Society	4
ENE,RES 102	Quantitative Aspects of Global Environmental Problems	4
EPS/INTEGBI C100/ GEOG C146	Communicating Ocean Science	4
ESPM 102B & 102BL	Natural Resource Sampling and Laboratory in Natural Resource Sampling	4

CHM ENG 140	Introduction to Chemical Process Analysis	4	ESPM 121	Development and Classification of Soils	3
CHM ENG 141	Chemical Engineering Thermodynamics	4	ESPM C128/ CIV ENG C116	Chemistry of Soils	3
CHM ENG 142	Chemical Kinetics and Reaction Engineering	4	ESPM/EPS C129	Biometeorology	3
CHM ENG 150A	Transport Processes	4	ESPM C130/ GEOG C136	Terrestrial Hydrology	4
CHM ENG 150B	Transport and Separation Processes	4	ESPM 131	Soil Microbiology and Biogeochemistry	3
CHM ENG 183	Climate Solutions Technologies	3	ESPM C148/ NUSCTX C114	Pesticide Chemistry and Toxicology	3
CHEM 103	Inorganic Chemistry in Living Systems	3	ESPM 157	Data Science in Global Change Ecology	4
CHEM 104A	Advanced Inorganic Chemistry	3	ESPM 164	GIS and Environmental Science	3
CHEM 104B	Advanced Inorganic Chemistry	3	ESPM C170	Carbon Cycle Dynamics	3
CHEM 105	Instrumental Methods in Analytical Chemistry	4	ESPM 172	Remote Sensing of the Environment	3
CHEM 120A	Physical Chemistry	3	ESPM 173	Introduction to Ecological Data Analysis	3
CHEM 120B	Physical Chemistry	3	ESPM 174	Design and Analysis of Ecological Research	4
CHEM 125	Physical Chemistry Laboratory	3	ESPM/ EPS C180/ CIV ENG C106	Air Pollution	3
CHEM C130/ MCELLBI C100A	Biophysical Chemistry: Physical Principles and the Molecules of Life	4	ESPM 181A	Fire Ecology	3
CHEM 130B	Biophysical Chemistry	3	GEOG C139	Atmosphere, Ocean, and Climate Dynamics	3
CHEM 135	Chemical Biology	3	GEOG 140A	Physical Landscapes: Process and Form	4
CHEM/EPS C182	Atmospheric Chemistry and Physics Laboratory	3	GEOG 142	Global Climate Variability and Change	4
CIV ENG 100	Elementary Fluid Mechanics	4	GEOG 143	Global Change Biogeochemistry	3
CIV ENG C103N	Terrestrial Hydrology	4	GEOG 144	Principles of Meteorology	3
CIV ENG C106	Air Pollution	3	GEOG 145	Platform Geographies	4
CIV ENG 107	Climate Change Mitigation	3	GEOG C146	Communicating Ocean Science	4
CIV ENG 111	Environmental Engineering	3	GEOG 180	Field Methods for Physical Geography	5
CIV ENG 113	Ecological Engineering for Water Quality Improvement	3	GEOG 183	Cartographic Representation	5
CIV ENG 115	Water Chemistry	3	GEOG/LD ARCH C188	Geographic Information Science	4
CIV ENG C116	Chemistry of Soils	3	GLOBAL 126	Development and the Environment	4
CIV ENG 171	Rock Mechanics	3	LD ARCH 120	Topographic Form and Design Technology	3
CIV ENG 173	Groundwater and Seepage	3	LD ARCH C188	Geographic Information Science	4
ENGIN/IAS 157AC	Engineering, The Environment, and Society	4	MATH 121A	Mathematical Tools for the Physical Sciences	4
EPS/INTEGBI C100/ GEOG C146	Communicating Ocean Science	4	MATH 121B	Mathematical Tools for the Physical Sciences	4
EPS 100A	Minerals: Their Constitution and Origin	4	MEC ENG 106	Fluid Mechanics	3
EPS 100B	Genesis and Interpretation of Rocks	4	Social Sciences Concentration Electives		
EPS 101	Field Geology and Digital Mapping	4	CIV ENG 107	Climate Change Mitigation	3
EPS 102	History and Evolution of Planet Earth	4	DEMOG/SOCIOL C126	Sex, Death, and Data	4
EPS 117	Geomorphology	4	DEMOG/ECON C175	Economic Demography	4
EPS 119	Geologic Field Studies	2	ECON/ ENVECON C102	Natural Resource Economics	4
EPS 131	Geochemistry	4	ECON C125/ ENVECON C101	Environmental Economics	4
EPS C180	Air Pollution	3	ECON C171/ ENVECON C151	Development Economics	4
EPS C181/ GEOG C139	Atmosphere, Ocean, and Climate Dynamics	3	ECON/DEMOG C175	Economic Demography	4
EPS C182	Atmospheric Chemistry and Physics Laboratory	3	ENE,RES C100	Energy and Society	4
ENE,RES C100/ PUB POL C184	Energy and Society	4	ENE,RES 101	Ecology and Society	3
ENE,RES 102	Quantitative Aspects of Global Environmental Problems	4			
ESPM 101A	The Politics and Practice of Sustainability Transitions	4			
ESPM 102B & 102BL	Natural Resource Sampling and Laboratory in Natural Resource Sampling	4			
ESPM 120	Science of Soils	3			

ENE,RES 102	Quantitative Aspects of Global Environmental Problems	4
ENE,RES 175	Water and Development	4
ENE,RES 180	Ecological Economics in Historical Context	3
ENGIN 125	Ethics, Engineering, and Society	3
ENGIN 157AC	Engineering, The Environment, and Society	4
ENVECON 100	Intermediate Microeconomics with Applications to Sustainability	4
ENVECON C101/ ECON C125	Environmental Economics	4
ENVECON/ ECON C102	Natural Resource Economics	4
ENVECON C115/ ESPM C104	Modeling and Management of Biological Resources	4
ENVECON 131	Globalization and the Natural Environment	3
ENVECON 147	The Economics of the Clean Energy Transition	4
ENVECON C151/ ECON C171	Development Economics	4
ENVECON 153	Population, Environment, and Development	3
ENVECON 161	Advanced Topics in Environmental and Resource Economics	4
ENVECON 162	Economics of Water Resources	3
EPS 102	History and Evolution of Planet Earth	4
ESPM 101A	The Politics and Practice of Sustainability Transitions	4
ESPM 102C	Resource Management	3
ESPM 102D	Climate and Energy Policy	4
ESPM C104/ ENVECON C115	Modeling and Management of Biological Resources	4
ESPM 117	Urban Garden Ecosystems	4
ESPM 151	Society, Environment, and Culture	4
ESPM 155AC	Sociology and Political Ecology of Agro-Food Systems <small>formerly ESPM 155</small>	4
ESPM 157	Data Science in Global Change Ecology	4
ESPM 160AC/ HISTORY 120AC	American Environmental and Cultural History	4
ESPM 161	Environmental Philosophy and Ethics	4
ESPM 162	Bioethics and Society	4
ESPM 163AC/ SOCIOLOG 137AC	Environmental Justice: Race, Class, Equity, and the Environment	4
ESPM 165	International Rural Development Policy	4
ESPM C167/ PB HLTH C160	Environmental Health and Development	4
ESPM 168	Political Ecology	4
ESPM 169	International Environmental Politics	4
ESPM 183	Forest Ecosystem Management and Planning	4
GEOG 130	Food and the Environment	4
GEOG/LD ARCH C188	Geographic Information Science	4
INTEGBI 117 & 117LF	Medical Ethnobotany and Medical Ethnobotany Laboratory	4
GLOBAL 126	Development and the Environment	4
LD ARCH 110	Ecological Analysis	3
LD ARCH 130	Sustainable Landscapes and Cities	4

LD ARCH C188	Geographic Information Science	4
SOCIOLOG C126	Sex, Death, and Data	4
SOCIOLOG 137AC	Environmental Justice: Race, Class, Equity, and the Environment	4

Reading and Composition (<http://guide.berkeley.edu/undergraduate/colleges-schools/natural-resources/reading-composition-requirement/>)

In order to provide a solid foundation in reading, writing and critical thinking all majors in the College require two semesters of lower division work in composition. Students must complete a first-level reading and composition course by the end of their second semester and a second-level course by the end of their fourth semester.

Foreign Language (<http://guide.berkeley.edu/undergraduate/colleges-schools/natural-resources/foreign-language-requirement/>): **EEP Majors only**

The Foreign Language requirement is only required by Environmental Economics and Policy (EEP) majors. It may be satisfied by demonstrating proficiency in reading comprehension, writing, and conversation in a foreign language equivalent to the second semester college level, either by passing an exam or by completing approved course work.

Quantitative Reasoning (<http://guide.berkeley.edu/undergraduate/colleges-schools/natural-resources/quantitative-reasoning-requirement/>): **EEP Majors only**

The Quantitative Reasoning requirement is only required by Environmental Economics and Policy (EEP) majors. The requirement may be satisfied by exam or by taking an approved course.

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 the Rausser College major requirements and each major requires a different number of breadth courses and categories. The EEP major is the only college major that requires the entire 7 course breadth. Refer to the major snapshots on each Rausser College major page (<https://nature.berkeley.edu/advising/majors-minors/>) for additional information.

High School Exam Credit

Rausser College 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%20Chat>) in the Rausser College Student Handbook (<https://nature.berkeley.edu/handbook/>) for more information.

Unit 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 Rausser College.
- 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. Courses taken for P/NP in the Spring 2020 semester will not count toward this limit.

Semester Unit Minimum

All Rausser College students must enroll in at least 12 units each fall and spring semester.

Semester Unit Maximum

To request permission to take more than 20.5 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 4 fall/spring semesters at UC Berkeley. Students who go on EAP and UCDC can petition for additional semesters. Other UC-affiliated programs, such as the Gump Station in Moorea, may also be considered. 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 semester. Rausser College does not limit the number of total units a student can accrue.

Senior Residence Requirement

Once you achieve and exceed 90 units (senior status), you must complete at least 24 of the remaining 30 units in residence at the Rausser 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 Rausser. 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 online ('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 6 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. Major and minor coursework taken in Spring 2020, Fall 2020, and Spring 2021 may be completed with P/NP grading option. See more details below.

Changes in Policies and Procedures during the COVID-19 Pandemic

Fall 2020, Spring 2021, SUMMER 2021

After much consultation across the colleges of UC Berkeley, and via our college Executive Committee, the following decisions have been made about the selection of the P/NP grade option (CPN) by undergraduate students during the Fall 2020 & Spring 2021 semesters for the Rausser College of Natural Resources.

- College Course Requirements: Reading and Composition, Quantitative Reasoning, and Foreign Language requirements normally satisfied with letter grades may be met with a passed (P) grade during the Fall 2020 semester. This does not include the system-wide Entry Level Writing requirement. College Writing R1A must be taken for a letter grade and completed with a C or better to fulfill the Entry Level Writing requirement.
- Requirements to Graduate: No changes in policy.
 - Rausser College students must have at least a 2.0 cumulative UC GPA to declare a Rausser College major.
 - Non-Rausser College students must have at least a 3.0 cumulative UC GPA to change to or add a Rausser College major.
 - Students must have at least a 2.0 cumulative UC GPA to graduate, both overall and in the upper-division courses required for the major.
- Academic Probation: The terms for Academic Probation (AP) have been modified.
 - Rausser CNR students currently in good standing who earn all "P" grades will remain in good standing.
 - Students currently in good standing who earn NP grades, Incompletes, or failing letter grades for more than 50% of units will be placed on academic probation and will be required to meet with their college advisor and complete an Academic Success Plan for the subsequent semester.
 - Students on AP must take all coursework for letter grades. Students on AP may be removed from probationary status with sufficient letter graded course work to raise their cumulative GPA above 2.0.
 - Students on Academic Probation who do not attain sufficient letter-graded coursework to be removed from AP (ie. enough grade points to raise cumulative GPA above 2.0 cumulative GPA)

will remain on AP for the subsequent semester and must complete an Academic Success Plan with their college advisor.

- Students on Academic Probation who earn NP grades, Incompletes, or failing letter grades for more than 50% of units will be Subject to Dismissal and will be required to meet with their college advisor and complete an Academic Success Plan for the subsequent semester.
- Term Probation: Students in this category are placed on academic probation if their GPA falls below 1.5 in any fall or spring semester ("Term"). To get back into good standing, you must earn a UC Berkeley term GPA of 2.0 the following regular semester (fall/spring) and maintain an overall GPA of 2.0. If you fail to meet these conditions, you will be subject to dismissal from the University. For Fall 2020 & Spring 2021, the terms for Term Probation have been modified.
 - Rausser CNR students currently in good standing who earn all "P" grades will remain in good standing and will not be placed on Term Probation.
- Transferring Credit: If you are taking coursework through another institution in Fall 2020 & Spring 2021, P grades earned will be accepted for all degree requirements. Note: This does not include the systemwide Entry Level Writing requirement. College Writing R1A must be taken for a letter grade and completed with a C or better to fulfill the Entry Level Writing requirement.

For additional information, please see Changes to Policies and Procedures for Fall 2020, Spring 2021, & Summer 2021 (<https://nature.berkeley.edu/advising/AY-2020-2021-policy-adjustments/>).

Spring 2020

In light of the substantial disruptions to instruction caused by the novel coronavirus emergency, the Berkeley Division of the Academic Senate made changes to grading options for the Spring 2020 semester. Rausser College adjusted college requirements as follows:

- College Course Requirements: All passing course work taken in Spring 2020 may be used for college requirements regardless of the grading option selected.
- Requirements to Graduate: To graduate, Rausser College students usually must have at least a 2.0 cumulative UC GPA to graduate, both overall and in the upper-division courses required for their major. For Spring 2020, students with at least a 1.9 cumulative GPA overall and in the upper-division courses required for their major to graduate will be considered as having met the requirement.
- Academic Probation: Recognizing the challenges to teaching and learning during the COVID-19 pandemic, Rausser College of Natural Resources will not be penalizing any students' academic progress for Spring 2020.
 - Students in good academic standing who earn all "P" grades will remain in good standing.
 - Students, who are in good standing, who earn NP grades, Incompletes, or failing grades for more than 50% of units will be required to meet with their college advisor and complete an Academic Success Plan for Fall 2020 by September 11, 2020, but will not be placed on Academic Probation.

- Students on Academic Probation may be removed from probationary status with sufficient letter graded course work to raise their cumulative GPA above 2.0.
- Students on Academic Probation who do not attain sufficient letter-graded coursework to be removed from AP (ie. enough grade points to raise cumulative GPA above 2.0 cumulative GPA) will remain on AP for Fall 2020 and must complete an Academic Success Plan with their college advisor by September 11, 2020.
- Term Probation: Recognizing the challenges to teaching and learning during the COVID-19 pandemic, Rausser College of Natural Resources will not be penalizing any students' academic progress for Spring 2020.
 - Students in good academic standing who earn all "P" grades will remain in good standing.
 - Students on Term Probation, but not AP, may be removed from probationary status with passing grades in at least 50% of units for Spring 2020.
 - Students on Term Probation at the start of Spring 2020 who earn NP, Incomplete, or failing grades for more than 50% of units must complete an Academic Success Plan with their college advisor by September 11, 2020 and will remain on Term Probation.
- Transferring Credit: If you are taking coursework through another institution in Spring 2020 (i.e. through Concurrent Enrollment or instead of being enrolled in Spring 2020 at UC Berkeley) and that institution has moved to a P/NP-default or P/NP-only grading model, P grades earned will be accepted for all degree requirements.

For additional information, please see Changes to Policies and Procedures for Spring 2020 (<https://nature.berkeley.edu/advising/spring-2020-changing-policies-faq/>).

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.

Major Maps help undergraduate students discover academic, co-curricular, and discovery opportunities at UC Berkeley based on intended major or field of interest. Developed by the Division of Undergraduate Education in collaboration with academic departments, these experience maps will help you:

- **Explore** your major and gain a better understanding of your field of study
- **Connect** with people and programs that inspire and sustain your creativity, drive, curiosity and success
- **Discover** opportunities for independent inquiry, enterprise, and creative expression
- **Engage** locally and globally to broaden your perspectives and change the world
- **Reflect** on your academic career and prepare for life after Berkeley

Use the major map below as a guide to planning your undergraduate journey and designing your own unique Berkeley experience.

View the Environmental Sciences Major Map PDF. (https://ue.berkeley.edu/sites/default/files/environmental_sciences.pdf)

At the Rausser 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 or minor, contact the undergraduate advisor for your intended major. To schedule an appointment or get in touch, please follow the instructions on our website (<https://nature.berkeley.edu/advising/meet-rausser-advisors/>).

Undergraduate Academic Advisor, Environmental Sciences

Bodo
 envsci.ugrad@berkeley.edu
 260 Mulford Hall
 510-642-4249

Common Career Paths for Environmental Sciences Majors

Career Destinations Survey

Every year the Career Center surveys graduating seniors (<https://career.berkeley.edu/start-exploring/where-do-cal-grads-go/>) 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://whatcanidowiththismajor.com/major/environmental-studies-science/#bottom>) 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/prepare-for-success/develop-a-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/start-exploring/majors-to-career/>) resource to explore additional career paths most commonly associated with over 80 majors, including Environmental Sciences (<https://whatcanidowiththismajor.com/major/environmental-studies-science/#bottom>).

Career Services Overview

Our Vision

Cultivate a university-wide culture of career readiness, where every student engages in meaningful experiences, has a supportive

professional community, and is empowered to achieve lifelong career success.

Our Mission

We are dedicated to advancing equity and access to career resources for every student and recent alumni of UC Berkeley.

We engage with students on their journey to reflect, discover, and design a personally meaningful career (Career Clarity (<https://career.berkeley.edu/start-exploring/career-essentials/gain-clarity/>)).

We connect students with alumni, employers, and their larger professional community to forge meaningful relationships that will guide them into their early career (Career Connections (<https://career.berkeley.edu/start-exploring/career-essentials/make-connections/>)).

We empower students to develop the professional confidence and experience necessary to secure the career opportunities they seek (Career Competitiveness (<https://career.berkeley.edu/start-exploring/career-essentials/develop-competitiveness/>)).

The Career Center utilizes Handshake (<https://career.berkeley.edu/handshake/>), a powerful recruiting platform that uses cutting-edge technology to help students more easily connect with employers, jobs, internships, events, and resources, as well as access to career coaching appointments.

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/find-opportunities/jobs/>): Resume and cover letter writing, job search strategies, networking tools, interviewing skills, and more, can be found in their Career Readiness Workbook. (https://issuu.com/calcareercenter/docs/cr_workbook_19-20__2_/)
- 24/7 Online Resources: (<https://career.berkeley.edu/resources-on-demand/>) Their Resources on Demand are here to help you engage and grow in your career development.
- Career Counseling: (<https://career.berkeley.edu/start-exploring/meet-with-us/career-counseling/>) They offer a wide variety of scheduled and drop-in appointment options based on major and topic.
- Internships (<https://career.berkeley.edu/find-opportunities/internships/>): Internship listings, search strategies, FAQs, and more.
- Career Exploration (<https://career.berkeley.edu/start-exploring/>): Discover their resources to help you explore career options, identify career goals, and develop effective career plans.
- Events and Workshops (<https://career.berkeley.edu/start-exploring/events/calendar/>): They deliver over 100 events each semester including workshops, alumni networking events, career panels, conferences, and Alumni Career Chats.
- Career Fairs (<https://career.berkeley.edu/find-opportunities/career-fairs/>) and Employer Information Sessions (<https://career.berkeley.edu/find-opportunities/employer-events/info-sessions/>): They offer a variety of career fairs each year across

different career fields and partner with numerous employers for on-campus information sessions.

- Graduate and Professional School (<https://career.berkeley.edu/get-into-grad-school/>): Counseling and resources to help students research and apply for graduate and professional school including medical school (<https://career.berkeley.edu/get-into-grad-school/medical-school/>) and law school (<https://career.berkeley.edu/get-into-grad-school/law-school/>).