EARTH SYSTEMS

Courses offered by the Earth Systems Program are listed under the subject code EARTHSYS (https://explorecourses.stanford.edu/search?q=EARTHSYS&view=catalog&page=0&academicYear=&filter-term-Autumn=on&filter-term-Winter=on&filter-term-Spring=on&filter-term-Summer=on&collapse=&filter-departmentcode-EARTHSYS=on&filter-coursestatus-Active=on&filter-catalognumber-EARTHSYS=on&filter-catalognumber-EARTHSYS=on) on the Stanford Bulletin's ExploreCourses web site.

Mission of the Undergraduate Program in Earth Systems

The Earth Systems Program is an interdisciplinary environmental science major. Students learn about and independently investigate complex environmental problems caused by human activities in conjunction with natural changes in the Earth system. Earth Systems majors become skilled in those areas of science, economics, and policy needed to tackle the world's most pressing social-environmental problems, becoming part of a generation of scientists, professionals, and citizens who approach and solve problems in a systematic, interdisciplinary way.

For students to be effective contributors to solutions for such problems, their training and understanding must be both broad and deep. To this end, Earth Systems students take fundamental courses in ecology, calculus, chemistry, geology, and physics, as well as economics, policy, and statistics. After completing breadth training, they concentrate on advanced work in one of six focus areas: biology, energy, environmental economics and policy, land systems, sustainable food and agriculture, or oceanography and climate. Tracks are designed to support focus and rigor but include flexibility for specialization. Examples of specialized foci have included but are not limited to environment and human health, sustainable agriculture, energy economics, sustainable development, business and the environment, and marine policy. Along with formal course requirements, Earth Systems students complete a 1-unit (270-hour) internship. The internship provides a hands-on academic experience working on a supervised field, laboratory, government, or private sector project.

The Earth Systems Program provides an advising network that includes faculty, staff, and student peer advisers.

The following is an outline of the sequential topics covered and skills developed in this major.

1. *Fundamentals:* The Earth Systems Program includes courses that describe the natural functioning of the physical and biological components of the Earth and human activities that interact with these components. Training in fundamentals includes introductory course work in geology, biology, chemistry, physics, and economics. Additional training in course work in single and multivariable calculus, linear algebra, and statistics provides students with skills needed for quantifying environmental problems. Training in statistics is specific to the area of focus: geostatistics, biostatistics, econometrics.
2. *System Interactions:* Focus in these courses is on the fundamental interactions among the physical, biological, and human components of the Earth system. Understanding the dynamics between natural variation in and human-imposed influences on the Earth system informs the development of effective solutions to social-environmental challenges.
   a. Earth Systems courses that introduce students to the dynamic and multiple interactions that characterize social-environmental challenges include:

EARTHSYS 10	Introduction to Earth Systems	4
EARTHSYS 111	Biology and Global Change	4
EARTHSYS 112	Human Society and Environmental Change	4

   b. Competence in understanding system-level interactions is critical to development as an Earth Systems thinker, so additional classes that meet this objective are excellent choices as electives.
3. *Track-Specific Requirements:* After completing a core designed to introduce students to different functional components of the Earth system, undergraduate students focus their studies through one of six tracks: Human Environmental Systems (formerly Anthrosphere); Biosphere; Energy, Science and Technology; Oceans and Climate (formerly Oceans); Land Systems; or Sustainable Food and Agriculture.
4. *Skills Development:* Students take skills courses that help them to recognize, quantify, describe, communicate, and help solve complex problems that face society. For example, field and laboratory methods can help students to recognize the scope and nature of environmental change. Training in satellite remote sensing and geographic information systems allows students to monitor and analyze large-scale spatial patterns of change. This training is either required or recommended for all tracks.
5. *Communication:* Success in building workable solutions to environmental problems is linked to the ability to effectively communicate ideas, data, and results. Writing intensive courses (WIM) help students to communicate complex concepts to expert and non-expert audiences. Other Earth Systems courses also focus on effective written and oral communication and are recommended. All Stanford students must complete one WIM course in their major. Earth Systems students can fulfill the WIM requirement by successfully completing one of the following courses:

		Units
EARTHSYS 200	Environmental Communication in Action: The SAGE Project	3
EARTHSYS 191	Concepts in Environmental Communication	3
EARTHSYS 177C	Specialized Writing and Reporting: Environmental Journalism	4-5
EARTHSYS 149	Wild Writing	3
EARTHSYS 135	Podcasting the Anthropocene	3

6. *Finding solutions:* Effective solutions to environmental problems take into consideration natural processes as well as human needs. Earth Systems emphasizes the importance of interdisciplinary analysis and implementation of workable solutions through:

		Units
EARTHSYS 210A	Senior Capstone and Reflection	3
or EARTHSYS 210B	Senior Capstone and Reflection	
EARTHSYS 210P	Earth Systems Capstone Project	2
EARTHSYS 260	Internship	1

A comprehensive list of environmental courses (p. 9) is available on the "Related Courses" tab. This list as well as advice on courses that focus on problem solving are available in the program office.

Learning Outcomes (Undergraduate)

The program expects majors to be able to demonstrate the following learning outcomes. These learning outcomes serve as benchmarks for evaluating students and the program's undergraduate degree. Students are expected to:

1. demonstrate knowledge of foundational skills and concepts relevant to interdisciplinary study of the environment.

Units

2. demonstrate the ability to integrate and apply relevant science, economics, engineering, and policy to social-environmental problem analysis and proposed solutions.
3. demonstrate the ability to communicate the ability to communicate complex concepts and data relevant to social-environmental problems, questions, and solutions to expert and non-expert audiences.

Learning Outcomes (Graduate)

The coterminal master's degree in Earth Systems provides the student with enhanced analytical tools to evaluate the disciplines most closely associated with the student's focus area. Specialization is gained through course work and independent research work supervised by the master's faculty adviser.

Bachelor of Science in Earth Systems

The B.S. in Earth Systems (EARTHSYS) requires the completion of courses divided into three categories:

1. core
2. foundation and breadth
3. track-specific requirements.

The student must fulfill the internship requirement, participate in the Senior Capstone and Reflection course (EARTHSYS 210A or EARTHSYS 210B), complete the Earth Systems Capstone Project (EARTHSYS 210P), and complete the Writing in the Major (WIM) requirement.

Core courses, track courses, and electives must be taken for a letter grade. The WIM course may not also count towards the track or electives, if counted as a WIM.

Required Core

		Units
EARTHSYS 10	Introduction to Earth Systems	4
EARTHSYS 111	Biology and Global Change	4
EARTHSYS 112	Human Society and Environmental Change	4
Select one of the following:		3
EARTHSYS 210A	Senior Capstone and Reflection	
EARTHSYS 210	Senior Capstone and Reflection	
EARTHSYS 210P	Earth Systems Capstone Project	2
EARTHSYS 260	Internship	1
Select one of the following (WIM):		
EARTHSYS 200	Environmental Communication in Action: The SAGE Project	
EARTHSYS 191	Concepts in Environmental Communication	
EARTHSYS 177	Specialized Writing and Reporting: Environmental Journalism	
EARTHSYS 149	Wild Writing	
EARTHSYS 135	Podcasting the Anthropocene	

Required Foundation and Breadth Courses

		Units
Biology		4-10
Select one of the following (see specific tracks; in some cases, other Bio courses are required):		
BIO 81	Introduction to Ecology	
BIOHOPK 43	Plant Biology, Evolution, and Ecology	
HUMBIO 2A & HUMBIO 2B	Genetics, Evolution, and Ecology and Culture, Evolution, and Society	
EARTHSYS 116	Ecology of the Hawaiian Islands	
Chemistry		5-10
Select one of the following:		
CHEM 31X	Chemical Principles Accelerated	
CHEM 31A & CHEM 31B	Chemical Principles I and Chemical Principles II	
Economics		5
ECON 1	Principles of Economics	
Geological Sciences [1]		4-5
Select one of the following:		
GS 1	Introduction to Geology	
GS 4	Coevolution of Earth and Life	
EARTHSYS 117	Earth Sciences of the Hawaiian Islands	
EARTHSYS 128	Evolution of Terrestrial Ecosystems	
Mathematics		5-15
MATH 19 & MATH 20 & MATH 21	Calculus and Calculus and Calculus	
MATH 51	Linear Algebra and Differential Calculus of Several Variables	
or CME 100	Vector Calculus for Engineers	
Probability and Statistics		3-5
Select one of the following:		
BIOHOPK 174H	Experimental Design and Probability	
BIO 141	Biostatistics	
ECON 102A	Introduction to Statistical Methods (Postcalculus) for Social Scientists	
STATS 110	Statistical Methods in Engineering and the Physical Sciences	
STATS 116	Theory of Probability	

More extensive work in mathematics and physics may be valuable for those planning graduate study. Graduate study in ecology and evolutionary biology and in economics requires familiarity with differential equations, linear algebra, and stochastic processes. Graduate study in geology, oceanography, and geophysics may require more physics and chemistry. Students should consult their adviser for recommendations beyond the requirements specified above.

[1] The Geological Sciences requirement can be fulfilled by completing GS 1, GS 4, or EARTHSYS 117. GS 1A, 1B, and 1C are no longer offered. If taken in previous years, these will still fulfill the Earth Systems' Geological Sciences requirement.

Tracks

Human Environmental Systems (formerly Anthrosphere)

		Units
Additional foundation and breadth courses		10
ECON 50	Economic Analysis I	
ECON 155	Environmental Economics and Policy	
Physics (select one of the following):		3-4
One physics class from the PHYSICS 20 or 40 series or GEOPHYS 110		
Choose one course in each of the three following sub-categories, with a total of six required. At least one of the six must be a skills/methods course marked with an asterisk (*):		
Economics and Environmental Policy		3-5
ANTHRO 164	Natural Resource Extraction: Use and Development: Assessing Policies, Practices and Outcomes	
EARTHSYS 136	The Ethics of Stewardship	

EARTHSYS 175	California Coast: Science, Policy, and Law
EARTHSYS 243	Environmental Advocacy and Policy Communication
ECON 51	Economic Analysis II
ECON 102B	Applied Econometrics *
ECON 121	(ECON 121 can count towards this track requirement. Not offered 17.18.)
ECON 150	Economic Policy Analysis
ECON 154	Law and Economics
ECON 159	Economic, Legal, and Political Analysis of Climate-Change Policy
GSBGEN 336	Energy Markets and Policy
INTNLREL 135A	International Environmental Law and Policy
IPS 270	The Geopolitics of Energy
LAW 2504	Environmental Law and Policy
MS&E 243	Energy and Environmental Policy Analysis
MS&E 294	Climate Policy Analysis
MS&E 295	Energy Policy Analysis
Social Entrepreneurship and the Environment	2-5
CEE 151	Negotiation
EARTHSYS 187	FEED the Change: Redesigning Food Systems
ENGR 231	Transformative Design
ETHICSOC 234F	Ethics on the Edge: Business, Non-Profit Organizations, Government, and Individuals
ME 206A	Design for Extreme Affordability
ME 377	Design Thinking Studio: Experiences in Innovation and Design
MS&E 177	Creativity Rules
MS&E 180	Organizations: Theory and Management
URBANST 132	Concepts and Analytic Skills for the Social Sector *
URBANST 133	Social Entrepreneurship Collaboratory
Sustainable Development	3-5
ANTHRO 162	Indigenous Peoples and Environmental Problems
ANTHRO 343	Culture as Commodity
ANTHRO 349	Anthropology of Capitalism
CEE 124	Sustainable Development Studio (must be taken for at least 3 units)
CEE 126A	(CEE 126A can count towards this track requirement. Not offered 17.18.)
CEE 126B	Stanford Sustainable Living Lab II
EARTHSYS 106	World Food Economy *
EARTHSYS 138	International Urbanization Seminar: Cross-Cultural Collaboration for Sustainable Urban Development
EARTHSYS 185	Feeding Nine Billion
ECON 52	Economic Analysis III *
ECON 118	Development Economics
HUMBIO 118	Theory of Ecological and Environmental Anthropology
OSPSANTG 29	Sustainable Cities: Comparative Transportation Systems in Latin America
POLISCI 124A	The American West
URBANST 107	Introduction to Urban and Regional Planning
URBANST 163	Land Use Control
URBANST 164	Sustainable Cities
Elective Requirement	6-10

Two additional courses at the 100-level or above are required. Each must be a minimum of 3 units.

Biosphere

		Units
Additional foundation and breadth courses		
Instead of Biology Foundation requirement listed in Required Foundation/Breadth section above, two of the following Bio courses are required:		5
BIO 81	Introduction to Ecology	
BIO 82	Genetics	
Or either BIO 81 or BIO 82 AND:		5
BIOHOPK 43	Plant Biology, Evolution, and Ecology	
Additional Chemistry requirement (in addition to 31A/B or X):		5
CHEM 33	Structure and Reactivity of Organic Molecules	
Physics (select one of the following):		4
PHYSICS 41	Mechanics	
or PHYSICS 45	Light and Heat	
or GEOPHYS 11	Introduction to the foundations of contemporary geophysics	
Choose two courses from Ecology and Conservation Biology, and one course from each of the remaining sub-categories below, total six required:		
Biogeochemistry		3-4
CEE 177	Aquatic Chemistry and Biology	
CEE 274A	Environmental Microbiology I	
EARTHSYS 132	Evolution of Earth Systems	
EARTHSYS 143	Molecular Geomicrobiology Laboratory	
EARTHSYS 151	Biological Oceanography	
EARTHSYS 152	Marine Chemistry	
EARTHSYS 155	Science of Soils	
EARTHSYS 158	Geomicrobiology	
GS 130	Soil Physics and Hydrology (Not offered in 2017-18.)	
Ecology and Conservation Biology		3-12
BIO 115	The Hidden Kingdom - Evolution, Ecology and Diversity of Fungi	
BIO 144	Conservation Biology: A Latin American Perspective	
BIOHOPK 172H	Marine Ecology: From Organisms to Ecosystems	
BIOHOPK 173H	Marine Conservation Biology	
BIOHOPK 177H	Dynamics and Management of Marine Populations	
BIOHOPK 185H	Ecology and Conservation of Kelp Forest Communities	
EARTHSYS 116	Ecology of the Hawaiian Islands	
EARTHSYS 128	Evolution of Terrestrial Ecosystems	
GS 123	Evolution of Marine Ecosystems	
OSPAUSTL 10	Coral Reef Ecosystems	
OSPAUSTL 25	Freshwater Systems	
OSPAUSTL 30	Coastal Forest Ecosystems	
OSPSANTG 58	Living Chile: A Land of Extremes	
OSPSANTG 85	(OSPSANTG 85 can count towards this track requirement. Not offered 17.18.)	
Ecosystems and Society [2]		3-5
ANTHRO 118	Heritage, Environment, and Sovereignty in Hawaii	
ANTHRO 147	Nature, Culture, Heritage	
ANTHRO 162	Indigenous Peoples and Environmental Problems	
ANTHRO 166	Political Ecology of Tropical Land Use: Conservation, Natural Resource Extraction, and Agribusiness	
ANTHRO 177	Environmental Change and Emerging Infectious Diseases	

ANTHRO 178	Evolution and Conservation in Galapagos	
BIOHOPK 168H	Disease Ecology: from parasites evolution to the socio-economic impacts of pathogens on nations	
EARTHSYS 107	Control of Nature	
EARTHSYS 129	Geographic Impacts of Global Change: Mapping the Stories	
EARTHSYS 185	Feeding Nine Billion	
HUMBIO 118	Theory of Ecological and Environmental Anthropology	
SIW 144	Energy, Environment, Climate and Conservation Policy: A Washington, D.C. Perspective	
Elective Requirement		6-10
Two additional courses at the 100-level or above are required. Each must be a minimum of 3 units.		

1 Must take GS 1, GS 4, or EARTHSYS 117 to fulfill this requirement. GS 1C is no longer offered but if taken in previous years fulfills this requirement.

2 May also use ANTHRO 183 to fulfill this requirement. This course is not offered this year.

Energy, Science and Technology

		Units
Instead of Biology Foundation requirement listed in Required Foundation/Breadth section above, select one of the following Bio courses:		8
BIO 81	Introduction to Ecology	
BIO 83	Biochemistry & Molecular Biology	
BIOHOPK 43	Plant Biology, Evolution, and Ecology	
HUMBIO 2A & HUMBIO 2B	Genetics, Evolution, and Ecology and Culture, Evolution, and Society	
EARTHSYS 116	Ecology of the Hawaiian Islands	
Additional Foundation and Breadth Courses		
PHYSICS 43	Electricity and Magnetism	
PHYSICS 45	Light and Heat	
CME 100	Vector Calculus for Engineers (preferred over MATH 51 for this track)	
Computer science requirement: One-unit of Computer Science is required (unless CME 100 was completed); see Earth Systems staff for approved CS courses.		0-1
Energy Fundamentals		3
ENGR 30	(ENGR 30 can count towards this track requirement.)	
Select one of the following:		3-4
CEE 272R	Modern Power Systems Engineering	
ENERGY 120	Fundamentals of Petroleum Engineering	
MATSCI 156	Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution	
Select one of the following:		3-5
EARTHSYS 101	Energy and the Environment	
EARTHSYS 102	Fundamentals of Renewable Power	
EARTHSYS 103	Understanding Energy	
Choose at least one course in each of the three sub-categories, total five required. Note that many of these have prerequisite work:		
Energy Resources & Technology		3-5
CEE 156	Building Systems	
CEE 176A	Energy Efficient Buildings	
EARTHSYS 101	Energy and the Environment	
EARTHSYS 103	Understanding Energy	
ENERGY 120	Fundamentals of Petroleum Engineering	
ENERGY 269	Geothermal Reservoir Engineering	
ENERGY 293B	Fundamentals of Energy Processes	
ENERGY 293C	Energy from Wind and Water Currents	
MATSCI 156	Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution	
ME 250	Internal Combustion Engines	
ME 260	Fuel Cell Science and Technology	
Sustainable Energy & Development		3-4
cee 126A	(CEE 126A is an option for this track requirement. Enroll in 3 units. Not offered 2017-18.)	
CEE 176B	Electric Power: Renewables and Efficiency	
CEE 221A	Planning Tools and Methods in the Power Sector	
CEE 226	Life Cycle Assessment for Complex Systems	
CEE 272S	(Not offered in 2017-18.)	
EARTHSYS 102	Fundamentals of Renewable Power	
EARTHSYS 146	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation	
ENERGY 153	Carbon Capture and Sequestration	
MATSCI 156	Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution	
URBANST 165	Sustainable Urban and Regional Transportation Planning	
Energy Policy, Economics & Entrepreneurship		2-4
ENERGY 104	Sustainable Energy for 9 Billion	
ENERGY 110	Engineering Economics	
ENERGY 171	Energy Infrastructure, Technology and Economics	
ENERGY 191	Optimization of Energy Systems	
GSBGEN 336	Energy Markets and Policy	
MS&E 243	Energy and Environmental Policy Analysis	
LAW 2503	Energy Law	
MS&E 294	Climate Policy Analysis	
MS&E 295	Energy Policy Analysis	
Elective Requirement		3-5
One additional course at the 100-level or above is required. This course must be a minimum of 3 units. 3 units of approved energy seminars may count as one elective. See Earth Systems staff for the approved seminar list.		

Land Systems

		Units
Additional foundation and breadth courses		4
PHYSICS 41	Mechanics	
or PHYSICS 45	Light and Heat	
or GEOPHYS 11	Introduction to the foundations of contemporary geophysics	
Choose at least one course in each of the four sub-categories below, total seven required:		
Land Ecosystems		3-4
BIO 144	Conservation Biology: A Latin American Perspective	
EARTHSYS 128	Evolution of Terrestrial Ecosystems	
EARTHSYS 155	Science of Soils	
EARTHSYS 180	Principles and Practices of Sustainable Agriculture	
ESS 256	Soil and Water Chemistry	
OSPSANTG 58	Living Chile: A Land of Extremes	
Water		3-4
CEE 101B	Mechanics of Fluids	
CEE 166A	Watersheds and Wetlands	
CEE 166B	Floods and Droughts, Dams and Aqueducts	

CEE 177	Aquatic Chemistry and Biology	
EARTHSYS 104	The Water Course	
GEOPHYS 190	Near-Surface Geophysics	
GS 130	Soil Physics and Hydrology (Not offered 2017-18.)	
Land Use		3-5
ANTHRO 166	Political Ecology of Tropical Land Use: Conservation, Natural Resource Extraction, and Agribusiness	
CEE 124	Sustainable Development Studio	
CEE 176A	Energy Efficient Buildings	
EARTHSYS 106	World Food Economy	
EARTHSYS 181	Urban Agriculture in the Developing World (Not offered 2017-18.)	
EARTHSYS 185	Feeding Nine Billion	
ESS 270	Analyzing land use in a globalized world	
URBANST 110	Utopia and Reality: Introduction to Urban Studies	
URBANST 113	Introduction to Urban Design: Contemporary Urban Design in Theory and Practice	
URBANST 163	Land Use Control	
URBANST 171	Urban Design Studio	
Methods		3-5
EARTHSYS 142	Remote Sensing of Land	
EARTHSYS 144	Fundamentals of Geographic Information Science (GIS)	
EARTHSYS 211	Fundamentals of Modeling (Not offered in 2017-18.)	
HISTORY 401A	(HISTORY 401A can count towards this track requirement. Not offered 17.18.)	
Elective Requirement		6-10

Two additional courses at the 100-level or above are required. Each must be a minimum of 3 units.

Sustainable Food and Agriculture

		Units
Instead of Biology Foundation requirement listed in Required Foundation/Breadth section above, the following Bio courses are required:		
BIO 81 & BIO 82	Introduction to Ecology and Genetics	4
or BIO 83	Biochemistry & Molecular Biology	
OR HUMBIO 2A & HUMBIO 2B		
OR EARTHSYS 116		
OR BIOHOPK 43		
Additional foundation and breadth courses		
PHYSICS 41	Mechanics	
or PHYSICS 45	Light and Heat	
or GEOPHYS 110	Introduction to the foundations of contemporary geophysics	
A total of seven courses are required from the Food and Agriculture focus areas:		
Fundamentals of Agriculture Production and Economics		9-10
Both required:		
EARTHSYS 106	World Food Economy	
EARTHSYS 185	Feeding Nine Billion	
Biogeophysical Dimensions		9-12
Required:		
EARTHSYS 155	Science of Soils	
And select two of the following:		
BIO 137	Plant Genetics	
GS 130	Soil Physics and Hydrology (Not offered 2017-18.)	
HUMBIO 113	The Human-Plant Connection	
HUMBIO 130	Human Nutrition	
Social Dimensions		3-5
Select one of the following:		
BIO 144	Conservation Biology: A Latin American Perspective	
EARTHSYS 105	Food and Community: Food Security, Resilience and Equity	
EARTHSYS 181	Urban Agriculture in the Developing World (Not offered in 2017-18.)	
EARTHSYS 187	FEED the Change: Redesigning Food Systems	
ECON 118	Development Economics	
HISTORY 203G	(HISTORY 203G can count towards this track requirement. Not offered 17.18.)	
HUMBIO 113S	Healthy/Sustainable Food Systems: Maximum Sustainability across Health, Economics, and Environment	
HUMBIO 166	Food and Society: Exploring Eating Behaviors in Social, Environmental, and Policy Context	
Applied Study in the Field		3-4
Required:		
EARTHSYS 180	Principles and Practices of Sustainable Agriculture	
Elective Requirement		6-10

Two additional courses at the 100-level or above are required. Each must be a minimum of 3 units.

Oceans and Climate (formerly Oceans)

		Units
Additional Foundation and Breadth Courses		0-5
MATH 51 & MATH 52	Linear Algebra and Differential Calculus of Several Variables and Integral Calculus of Several Variables (CME 100 preferred over MATH 51 and MATH 52)	
or CME 100	Vector Calculus for Engineers	
Physics (select one of the following):		3-4
PHYSICS 41	Mechanics	
PHYSICS 45	Light and Heat	
or GEOPHYS 110	Introduction to the foundations of contemporary geophysics	
Physics of the Atmosphere and Climate		3
Select one of the following:		
CEE 63	Weather and Storms (Students are discouraged from taking CEE 63 in 2017.18. EARTHSYS 164 is not offered in 2017.18, so EARTHSYS 146A and EARTHSYS 146B should be taken to fulfill these track requirements instead.)	
EARTHSYS 146A	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation (preferred)	
Physics of the Ocean		3-4
Select one of the following:		
EARTHSYS 164	Introduction to Physical Oceanography (Not given in 2017.18. Students must take EARTHSYS 146A and EARTHSYS 146B instead.)	
EARTHSYS 146B	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation	
Spatial Analysis		3-4
EARTHSYS 141	Remote Sensing of the Oceans	
Biological Oceanography		3-4
Select one of the following:		

EARTHSYS 151	Biological Oceanography (preferred; take at the same time as EARTHSYS 152)	
BIOHOPK 163H	Oceanic Biology	
Marine Chemistry		3-4
EARTHSYS 152	Marine Chemistry	
Human Dimensions		1-5
Select one of the following:		
BIOHOPK 173H	Marine Conservation Biology	
BIOHOPK 280	Short Course on Ocean Policy	
EARTHSYS 175	California Coast: Science, Policy, and Law	
EARTHSYS 243	Environmental Advocacy and Policy Communication	
LAW 2506	Natural Resources Law and Policy (Seniors only.)	
Field Experience [1]		12-20
Select at least one of the following:		
One quarter abroad at the Stanford in Australia Program		
One quarter at Stanford @ SEA		
One quarter (or more) at the Hopkins Marine Station		
Elective Requirement		6-10

Two additional courses at the 100-level or above are required. Each must be a minimum of 3 units. See Earth Systems staff for a list of possible electives.

[1] Courses taken during Stanford@SEA and BOSP Australia cannot be substituted for track requirements but can count toward electives.

Summary of Course Requirements and Units

For all students:

	Units
Earth Systems Introduction and Core	12
Required Foundation and Breadth Courses	31-48
Internship	1
Senior Capstone & Reflection and Capstone Project	5
Writing in the Major (WIM)	3-5

Track-Specific:

	Units
Human Environmental Systems (formerly Anthrosphere) Track	38-54
Biosphere Track	40-60
Energy, Science and Technology Track	34-47
Land Systems Track	31-44
Sustainable Food and Agriculture Track	34-45
Oceans and Climate Track	37-63

Honors Program

The Earth Systems honors program provides students with an opportunity to pursue interdisciplinary research. It consists of a year-long research project that is mentored by one or more Earth Systems-affiliated faculty members, and culminates in a written thesis.

To qualify for the honors program, students must have and maintain a minimum overall GPA of 3.4. Potential honors students should complete the EARTHSYS 111 Biology and Global Change and EARTHSYS 112 Human Society and Environmental Change sequence by the end of the junior year. Qualified students can apply in Spring Quarter of the junior year, or the fourth quarter before graduation (check with program for specific application deadlines) by submitting a detailed research proposal and a brief statement of support from a faculty research adviser. Students who elect to do an honors thesis should begin planning no later than Winter Quarter of the junior year.

A maximum of 9 units is awarded for thesis research through EARTHSYS 199 Honors Program in Earth Systems. Those 9 units may not substitute for any other required parts of the Earth Systems curriculum. All theses are evaluated for acceptance by the thesis faculty adviser, one additional faculty member (who is the second reader), and the Director of Earth Systems. Both the adviser and second reader must be members of the Academic Council. Acceptance into the Honors program is not a guarantee of graduating with the honors designation.

Honors students are required to present their research publicly, preferably through the School of Earth, Energy, and Environmental Sciences' Annual Thesis Symposium, which highlights undergraduate and graduate research in the school. Faculty advisers are encouraged to sponsor presentation of student research results at professional society meetings.

Minor in Earth Systems, Sustainability Subplan

The minor in Earth Systems, Sustainability subplan, provides an introduction to fundamental science, interdisciplinary systems thinking, and environmental justice considerations, as well as a foundation in practical skills and applied problem solving experience needed to understand social-environmental systems and address intergenerational sustainability challenges. Students declaring the minor in Earth Systems must also declare the Sustainability subplan.

Students pursuing the minor must take the courses listed below and approved electives for a minimum of 35 units. Courses that count towards the fulfillment of major requirements may not be counted towards the minor, and all courses must be taken for a letter grade.

Students declaring a minor in Earth Systems must do so no later than two quarters prior to their intended quarter of degree conferral; for example, a student must declare a minor before the end of Autumn Quarter to graduate the following Spring Quarter. The Sustainability subplan must also be declared in Axess when declaring the minor. In addition, students pursuing the minor must complete the Multiple Major/Minor Form (http://studentaffairs.stanford.edu/sites/default/files/registrar/files/MajMin_MultMaj.pdf) and have it reviewed by all applicable departments/programs. This form must be submitted to the Student Services Center (https://studentservicescenter.stanford.edu) by the application to graduate deadline for the term in which the student intends to graduate.

Required Course Work

Core

		Units
EARTHSYS 10	Introduction to Earth Systems	4
EARTHSYS 111	Biology and Global Change	4
EARTHSYS 112	Human Society and Environmental Change	4
	(ECON 1 recommended as a pre- or co-requisite to EARTHSYS 112.)	
	(Prerequisites to EARTH 280 for the minor: EARTHSYS 111, EARTHSYS 112.)	
EARTHSYS 131	Pathways in Sustainability Careers	1
SUST 210	Pursuing Sustainability: Managing Complex Social Environmental Systems (SUST 210 is a required course for the minor; this will be an active course as of Autumn 17-18.)	3

Electives

Students must take a minimum of 19 units of electives at the 100-level or above that address dimensions of environmental systems and social-

environmental systems in theory or practice, with at least one course taken in each category.

Of the electives selected from the categories above,

- at least one course must address dimensions of environmental justice in theory or practice;
- at least two courses must provide opportunities to develop skills applicable to sustainability-related questions or challenges; and
- at least one course must engage students in applied problem solving on a sustainability-related question or challenge.

A list of approved electives is available on the Earth Systems website and in the Earth Systems Program office (Y2E2 131). Students may petition to count one relevant freshman or sophomore seminar toward the minor.

Coterminal Master's Degrees in Earth Systems

The Earth Systems Program offers current Stanford University undergraduates the opportunity to apply to a one-year coterminal master's program. Earth Systems offers a coterminal Master of Science (M.S.) degree in Earth Systems and a coterminal Master of Arts (M.A.) degree in Earth Systems, Environmental Communication. The Environmental Communication subplan prints on both the transcript and the diploma.

Application and Admission

The Earth Systems Program has quarterly coterminal degree application deadlines: November 7, 2017; February 20, 2018; and May 15, 2018. Seniors must apply by Winter Quarter deadline. To apply, students should submit an online application. The application includes the following:

- The Stanford coterminal application (https://www.applyweb.com/stanterm)
- A statement of purpose
- A resume
- A current Stanford unofficial transcript
- Two letters of recommendation, one of which must be from the master's adviser (who must be an Academic Council member; each coterminal M.A. student has two advisers: Thomas Hayden and Kevin Arrigo, or another approved faculty adviser)
- Master's Program Proposal (https://earth.stanford.edu/esys/program-forms): A list of courses that fulfill degree requirements signed by the master's adviser

1. Applications must be submitted no later than the quarter prior to the expected completion of the B.S. degree (and within quarterly application deadlines). An application fee is assessed by the Registrar's Office for coterminal applications, once students are matriculated into the program.
2. Students applying to the coterminal master's program must have completed a minimum of 120 units toward graduation with a minimum overall Stanford GPA of 3.4.
3. All applicants must devise a program of study that shows a level of specialization appropriate to the master's level, as determined in consultation with the master's adviser and the Director of Earth Systems. (See also following sections, Master of Science and Master of Arts in Earth Systems Degree Requirements).
4. Students applying from an undergraduate major other than Earth Systems should review their undergraduate course list with Deana Fabbro-Johnston, Richard Nevle, or Thomas Hayden (M.A. only).
5. The student has the option of receiving the B.S. degree after completing that degree's requirements or receiving the B.S. and M.A./M.S. degrees concurrently at the completion of the master's program.
6. Students must submit a new application to change from the M.S. to the M.A. in Earth Systems, or from the M.A. to the M.S. in Earth Systems. If accepted, the student must submit a Graduate Authorization Petition through Axess; a $125 fee applies to a successful Graduate Authorization Petition.

University Coterminal Requirements

Coterminal master's degree candidates are expected to complete all master's degree requirements as described in this bulletin. University requirements for the coterminal master's degree are described in the "Coterminal Master's Program (http://exploredegrees.stanford.edu/cotermdegrees)" section. University requirements for the master's degree are described in the "Graduate Degrees (http://exploredegrees.stanford.edu/graduatedegrees/#masterstext)" section of this bulletin.

After accepting admission to this coterminal master's degree program, students may request transfer of courses from the undergraduate to the graduate career to satisfy requirements for the master's degree. Transfer of courses to the graduate career requires review and approval of both the undergraduate and graduate programs on a case by case basis.

In this master's program, courses taken during or after the first quarter of the sophomore year are eligible for consideration for transfer to the graduate career; the timing of the first graduate quarter is not a factor. No courses taken prior to the first quarter of the sophomore year may be used to meet master's degree requirements.

Course transfers are not possible after the bachelor's degree has been conferred.

The University requires that the graduate adviser be assigned in the student's first graduate quarter even though the undergraduate career may still be open. The University also requires that the Master's Degree Program Proposal be completed by the student and approved by the department by the end of the student's first graduate quarter.

Coterminal Master of Science in Earth Systems

Degree Requirements

The master of science degree in Earth Systems allows specialization through graduate-level course work that may include up to 9 units of research with the master's adviser. This may culminate in the preparation of a M.S. thesis; however, a thesis is not required for the degree. The process of building mastery in the field is enriched through steady communication with a faculty adviser.

The following are required of all M.S. students:

- A minimum of 45 units of course work and/or research credit (upon approval).
- At least 34 units of the student's course work for the master's program must be at the 200-level or above.
- All remaining course work must be at the 100-level or above.
- All courses for the master's program must be taken for a letter grade; courses not taken for a letter grade must be approved by the master's adviser and Director of Earth Systems.
- A minimum overall GPA of 3.4 must be maintained.
- All coterminal master's students are required to take the capstone course, EARTHSYS 290 Master's Seminar.

For the Master of Science degree in Earth Systems, the following courses must be taken if not completed in the undergraduate degree program.

These courses do not have to be completed before applying to the coterm program. These may not be counted as part of the 45-unit master's degree:

		Units
Core (both required):		8
EARTHSYS 111	Biology and Global Change	
EARTHSYS 112	Human Society and Environmental Change	
Biology: One Biology Foundations/Core course pre-approved by Master's adviser, OR select from the following:		4-10
BIOHOPK 43	Plant Biology, Evolution, and Ecology	
HUMBIO 2A & HUMBIO 2B	Genetics, Evolution, and Ecology and Culture, Evolution, and Society	
EARTHSYS 116	Ecology of the Hawaiian Islands	
Chemistry (select one of the following):		5-10
CHEM 31X	Chemical Principles Accelerated	
CHEM 31A & CHEM 31B	Chemical Principles I and Chemical Principles II	
Physics (select one of the following):		3-4
One physics class from the PHYSICS 20 or 40 series or GEOPHYS 110		
Mathematics (select one of the following):		5
MATH 51	Linear Algebra and Differential Calculus of Several Variables	
CME 100	Vector Calculus for Engineers	
Statistics (select one of the following):		3-5
BIOHOPK 174H	Experimental Design and Probability	
BIO 141	Biostatistics	
ECON 102A	Introduction to Statistical Methods (Postcalculus) for Social Scientists	
STATS 110	Statistical Methods in Engineering and the Physical Sciences	
STATS 116	Theory of Probability	

Coterminal Master of Arts in Earth Systems, Environmental Communication

Degree Requirements

The Master of Arts in Earth Systems, Environmental Communication, provides an overview of the theory, techniques, and challenges of communicating environmental concepts to non-specialist audiences and includes hands-on experience with different modalities of communication, principally writing, multimedia production, and education. The degree program is built on a three quarter progression of required core courses, including a required practicum experience, along with electives. Students complete 22 units of required core courses along with 23 units of focus courses to be chosen in close consultation with Thomas Hayden and a faculty co-adviser.

For the master of arts degree, prerequisites may vary based on the interests and academic background of each student, to be determined in consultation with primary adviser Thomas Hayden, the faculty co-adviser, and the Director of Earth Systems. At a minimum, entering students must have completed EARTHSYS 10 Introduction to Earth Systems (may be audited), EARTHSYS 111 Biology and Global Change, and EARTHSYS 112 Human Society and Environmental Change. These courses do not have to be completed before applying to the coterm program. Additional course work in the sciences, mathematics, and other fields may also be required on a case-by-case basis; such required foundational course work may not count toward the 45 units of master's-level course requirements.

The following are required of all M.A. students:

- All M.A. students must declare the Environmental Communication subplan in Axess.
- A minimum of 45 units of course work and/or research credit (upon approval).
- At least 34 units of the student's course work for the master's program must be at the 200-level or above.
- All remaining course work must be at the 100-level or above.
- All courses for the master's program must be taken for a letter grade; courses not taken for a letter grade must be approved by the master's adviser and Director of Earth Systems.
- A minimum overall GPA of 3.4 must be maintained.
- All coterminal master's students are required to take the capstone course, EARTHSYS 290 Master's Seminar.

Director: Kevin Arrigo

Deputy Director: Richard Nevle

Associate Director: Deana Fabbro-Johnston

Affiliated Faculty and Lecturers: Michelle Anderson (Law), Patrick Archie (Earth Systems, Earth System Science), Nicole Ardoin (School of Education, Woods Institute for the Environment), Kevin Arrigo (Earth Systems, Earth System Science), Gregory Asner (Department of Global Ecology, Carnegie Institution), Greg Beroza (Geophysics), Barbara Block (Biology, Hopkins Marine Station, Woods Institute for the Environment), Alexandria Boehm (Civil and Environmental Engineering), Gordon Brown (Geological Sciences), Marshall Burke (Earth System Science), Ken Caldeira (Earth System Science), Liz Carlisle (Earth Systems), Karen Casciotti (Earth System Science), Page Chamberlain (Earth System Science), Larry Crowder (Biology, Woods Institute for the Environment), Danny Cullenward (Earth Systems), Lisa Curran (Anthropology, Woods Institute for the Environment), Gretchen Daily (Biology, Woods Institute for the Environment), Jenna Davis (Civil and Environmental Engineering, Woods Institute for the Environment), Anne Dekas (Earth System Science), Mark Denny (Biology, Hopkins Marine Station), Noah Diffenbaugh (Earth System Science, Woods Institute for the Environment), Rodolfo Dirzo (Biology, Woods Institute for the Environment), Robert Dunbar (Earth System Science, Woods Institute for the Environment), Debra Dunn (Earth Systems, Hasso Plattner Institute of Design), William Durham (Anthropology, Woods Institute for the Environment), Louis Durlofsky (Energy Resources Engineering), Stefano Ermon (Computer Science), Gary Ernst (Geological Sciences, emeritus), Walter Falcon (Freeman Spogli Institute for International Studies, emeritus, Woods Institute for the Environment), Scott Fendorf (Earth System Science, Woods Institute for the Environment, Precourt Institute for Energy), Christopher Field (Woods Institute for the Environment), Christopher Francis (Earth System Science, Woods Institute for the Environment), Zephyr Frank (History, Woods Institute for the Environment), David Freyberg (Civil and Environmental Engineering, Woods Institute for the Environment), Tad Fukami (Biology), Margot Gerritsen (Energy Resources Engineering), Elizabeth Hadly (Biology, Woods Institute for the Environment), Thomas Hayden (Earth Systems), George Hilley (Geological Sciences), Suki Hoagland (Earth Systems), Robert Jackson (Earth System Science, Woods Institute for the Environment), Michael Kahan (Urban Studies), David Kennedy (History, emeritus, Woods Institute for the Environment), Alexandra Konings (Earth System Science), Karl Knapp (Atmosphere and Energy Operations), Rosemary Knight (Geophysics, Woods Institute for the Environment), Jonathan Koomey (Earth Systems), Jeffrey Koseff (Civil and Environmental Engineering), Anthony Kovscek (Energy Resources Engineering), Eric Lambin (Earth System Science, Woods Institute for the Environment), Jim Leape (Center for Ocean Solutions), David Lobell (Earth System Science, Woods Institute for the Environment), Evan Lyons (Earth Systems Science), Gilbert Masters (Civil and Environmental Engineering), Pamela Matson (Dean, School of Earth, Energy & Environmental Sciences, Freeman Spogli Institute for International Studies, Woods Institute for the Environment), Anna Michalak (Earth System Science), Fiorenza

Micheli (Hopkins Marine Station, Center for Ocean Solutions), Stephen Monismith (Civil and Environmental Engineering, Woods Institute for the Environment), Ian Monroe (Earth Systems), Harold Mooney (Biology, emeritus, Woods Institute for the Environment), Rosamond Naylor (Earth System Science, Freeman Spogli Institute for International Studies, Woods Institute for the Environment), Richard Nevle (Earth Systems), Julia Novy-Hildesley (Sustainability Science and Practice), Michael Osborne (Earth Systems), Stephen Palumbi (Biology, Hopkins Marine Station, Woods Institute for the Environment), Jonathan Payne (Geological Sciences), Kabir Peay (Biology), Emily Polk (Program in Writing and Rhetoric), Thomas Robinson (Medicine), Matt Rothe (Earth Systems, Hasso Plattner Institute of Design, Graduate School of Business), Jennifer Saltzman (Geological Sciences), Dustin Schroeder (Geophysics), Paul Segall (Geophysics), Deborah Sivas (Law), George Somero (Biology, Hopkins Marine Station), Jenny Suckale (Geophysics), James Sweeney (Management Science and Engineering, Woods Institute for the Environment), Leif Thomas (Earth System Science), Barton Thompson, Junior (Law, Woods Institute for the Environment), Sarah Truebe (Earth Systems), Tiziana Vanorio (Geophysics), Peter Vitousek (Biology, Emmett Interdisciplinary Program in Environment and Resources, Woods Institute for the Environment), Virginia Walbot (Biology), Paula Welander (Earth System Science), Cindy Wilber (Jasper Ridge), Michael Wilcox (Anthropology), Mikael Wolfe (History), Jane Woodward (Atmosphere and Energy Operations), Mark Zoback (Geophysics)

Overseas Studies Courses in Earth Systems

The Bing Overseas Studies Program (http://bosp.stanford.edu) manages Stanford study abroad programs for Stanford undergraduates. Students should consult their department or program's student services office for applicability of Overseas Studies courses to a major or minor program.

The Bing Overseas Studies course search site (https://undergrad.stanford.edu/programs/bosp/explore/search-courses) displays courses, locations, and quarters relevant to specific majors.

For course descriptions and additional offerings, see the listings in the Stanford Bulletin's ExploreCourses (http://explorecourses.stanford.edu) or Bing Overseas Studies (http://bosp.stanford.edu).

		Units
OSPAUSTL 10	Coral Reef Ecosystems	3
OSPAUSTL 25	Freshwater Systems	3
OSPAUSTL 30	Coastal Forest Ecosystems	3
OSPCPTWN 63	Socio-Ecological Systems	3
OSPKYOTO 45	Japan's Energy-Environment Conundrum	4
OSPMADRD 79	Earth and Water Resources' Sustainability in Spain	3-4
OSPSANTG 58	Living Chile: A Land of Extremes	5

Environmental Courses List

		Units
AA 115N	The Global Positioning System: Where on Earth are We, and What Time is It?	
AA 116Q	Electric Automobiles and Aircraft	
AA 260	Sustainable Aviation	
AA 272C	Global Positioning Systems	
AFRICAAM 47	History of South Africa	
AFRICAAM 147	History of South Africa	
AFRICAST 109	Running While Others Walk: African Perspectives on Development	
AFRICAST 112	AIDS, Literacy, and Land: Foreign Aid and Development in Africa	
AFRICAST 141A	Science, Technology, and Medicine in Africa	
AFRICAST 209	Running While Others Walk: African Perspectives on Development	
AMSTUD 1B	Media, Culture, and Society	
AMSTUD 124A	The American West	
AMSTUD 136X	Indigenous Peoples and Environmental Change in the North American Wes	
ANTHRO 11SC	Conservation and Development Dilemmas in the Amazon	
ANTHRO 12SC	Parks and Peoples: Dilemmas of Protected Area Conservation in East Africa	
ANTHRO 18	Peopling of the Globe: Changing Patterns of Land Use and Consumption Over the Last 50,000 Years	
ANTHRO 31	Ecology, Evolution, and Human Health	
ANTHRO 34	Animals and Us	
ANTHRO 90C	Theory of Ecological and Environmental Anthropology	
ANTHRO 106	Incas and their Ancestors: Peruvian Archaeology	
ANTHRO 110A	Neandertals and Modern Humans: Origin, Evolution, Interactions	
ANTHRO 117	Thinking Through Animals	
ANTHRO 118	Heritage, Environment, and Sovereignty in Hawaii	
ANTHRO 119	Zooarchaeology: An Introduction to Faunal Remains	
ANTHRO 125	Language and the Environment	
ANTHRO 130B	Introduction to GIS in Anthropology	
ANTHRO 137	The Politics of Humanitarianism	
ANTHRO 141A	Science, Technology, and Medicine in Africa	
ANTHRO 147	Nature, Culture, Heritage	
ANTHRO 155	Research Methods in Ecological Anthropology	
ANTHRO 156B	Environment, Nature and Race	
ANTHRO 160	Social and Environmental Sustainability: The Costa Rican Case	
ANTHRO 160A	Tragedy of the Commons: Human Ecology of Communal Resources	
ANTHRO 161A	Human Ecology: Adaptations to Climate and Climate Change	
ANTHRO 162	Indigenous Peoples and Environmental Problems	
ANTHRO 163	Conservation and Evolutionary Ecology	
ANTHRO 164	Natural Resource Extraction: Use and Development: Assessing Policies, Practices and Outcomes	
ANTHRO 164A	Anthropology of Ecotourism	
ANTHRO 165	Parks and Peoples: The Benefits and Costs of Protected Area Conservation	
ANTHRO 165A	People and Parks: Management of Protected Areas	
ANTHRO 166	Political Ecology of Tropical Land Use: Conservation, Natural Resource Extraction, and Agribusiness	
ANTHRO 167A	A Wilderness Empire: The Political Ecology of California	
ANTHRO 168	Everest: Extreme Anthropology	
ANTHRO 168A	Risky Environments: The Nature of Disaster	
ANTHRO 169	The Ecology of Cuisine: Food, Nutrition, and the Evolution of the Human Diet	
ANTHRO 170	Australian Ecosystems: Human Dimensions and Environmental Dynamics	
ANTHRO 172	Seminar on Cultural Evolution and Coevolution	

ANTHRO 177	Environmental Change and Emerging Infectious Diseases
ANTHRO 178	Evolution and Conservation in Galapagos
ANTHRO 219	Zooarchaeology: An Introduction to Faunal Remains
ANTHRO 225	Language and the Environment
ANTHRO 230B	Introduction to GIS in Anthropology
ANTHRO 237	The Politics of Humanitarianism
ANTHRO 247	Nature, Culture, Heritage
ANTHRO 255	Research Methods in Ecological Anthropology
ANTHRO 260	Social and Environmental Sustainability: The Costa Rican Case
ANTHRO 260A	Tragedy of the Commons: Human Ecology of Communal Resources
ANTHRO 261A	Human Ecology: Adaptations to Climate and Climate Change
ANTHRO 262	Indigenous Peoples and Environmental Problems
ANTHRO 263	Conservation and Evolutionary Ecology
ANTHRO 264	Natural Resource Extraction: Use and Development: Assessing Policies, Practices and Outcomes
ANTHRO 266	Political Ecology of Tropical Land Use: Conservation, Natural Resource Extraction, and Agribusiness
ANTHRO 268A	Risky Environments: The Nature of Disaster
ANTHRO 270	Australian Ecosystems: Human Dimensions and Environmental Dynamics
ANTHRO 272	Seminar on Cultural Evolution and Coevolution
ANTHRO 277	Environmental Change and Emerging Infectious Diseases
ANTHRO 278	Evolution and Conservation in Galapagos
ANTHRO 283	Ecology, Evolution, and Human Health
ANTHRO 302	History of Anthropological Theory, Ecology and Environment
ANTHRO 305	Research Methods in Ecological Anthropology
ANTHRO 353	Landscape
ANTHRO 362A	Introduction to Human Evolution, Ecology, Genetics, and Culture
ANTHRO 363A	Anthropology of Environmental Conservation
ANTHRO 364	EcoGroup: Current Topics in Ecological, Evolutionary, and Environmental Anthropology
ANTHRO 364A	EcoGroup: Problems in Ecological and Evolutionary Anthropology
ANTHRO 368	Dynamics of Coupled Human-Natural Systems
ANTHRO 372	Urban Ecologies
ANTHRO 378	Dynamics of Coupled Human-Natural Systems
APPPHYS 219	Solid State Physics Problems in Energy Technology
APPPHYS 294	Cellular Biophysics
ARCHLGY 12	Peopling of the Globe: Changing Patterns of Land Use and Consumption Over the Last 50,000 Years
ARCHLGY 102E	Incas and their Ancestors: Peruvian Archaeology
ARCHLGY 119	Zooarchaeology: An Introduction to Faunal Remains
ARCHLGY 126	Archaeobotany
ARCHLGY 224	Archaeology of Food: production, consumption and ritual
ARCHLGY 226	Archaeobotany
ARTHIST 152	The American West
ARTSTUDI 12A	Drawing Intensive: Revisiting Nature
ARTSTUDI 153	Ecology of Materials
ARTSTUDI 153I	Ecology of Materials
ARTSTUDI 157	Art, Invention, Activism in the Public Sphere
ARTSTUDI 253	ECOLOGY OF MATERIALS
BIO 2N	Ecology and Evolution of Infectious Disease in a Changing World
BIO 3	Frontiers in Marine Biology
BIO 3N	Views of a Changing Sea: Literature & Science
BIO 7N	Introduction to Conservation Photography
BIO 8N	Human Origins
BIO 10AX	Conservation Photography
BIO 10SC	Natural History, Marine Biology, and Research
BIO 12N	Sensory Ecology of Marine Animals
BIO 30	Ecology for Everyone
BIO 33N	Conservation Science and Practice
BIO 34N	Hunger
BIO 105A	Ecology and Natural History of Jasper Ridge Biological Preserve
BIO 105B	Ecology and Natural History of Jasper Ridge Biological Preserve
BIO 108	Essential Statistics for Human Biology
BIO 115	The Hidden Kingdom - Evolution, Ecology and Diversity of Fungi
BIO 116	Ecology of the Hawaiian Islands
BIO 117	Biology and Global Change
BIO 137	Plant Genetics
BIO 138	Ecosystem Services: Frontiers in the Science of Valuing Nature
BIO 141	Biostatistics
BIO 144	Conservation Biology: A Latin American Perspective
BIO 145	Ecology and Evolution of Animal Behavior
BIO 146	Population Studies
BIO 157	Biochemistry and Molecular Biology of Plants
BIO 182	Modeling Cultural Evolution
BIO 196A	Biology Senior Reflection
BIO 196B	Biology Senior Reflection
BIO 196C	Biology Senior Reflection
BIO 202	Ecological Statistics
BIO 208	Spanish in Science/Science in Spanish
BIO 227	Foundations of Community Ecology
BIO 234	Conservation Biology: A Latin American Perspective
BIO 238	Ecosystem Services: Frontiers in the Science of Valuing Nature
BIO 245	Ecology and Evolution of Animal Behavior
BIO 257	Biochemistry and Molecular Biology of Plants
BIO 274S	Hopkins Microbiology Course
BIO 286	Natural History of the Vertebrates
BIO 312	Ethical Issues in Ecology and Evolutionary Biology
BIO 375	Field Ecology & Conservation
BIO 459	Frontiers in Interdisciplinary Biosciences
BIOC 459	Frontiers in Interdisciplinary Biosciences
BIOE 44	Fundamentals for Engineering Biology Lab
BIOE 80	Introduction to Bioengineering (Engineering Living Matter)
BIOE 191	Bioengineering Problems and Experimental Investigation

BIOE 372	Design for Service Innovation
BIOE 459	Frontiers in Interdisciplinary Biosciences
BIOHOPK 43	Plant Biology, Evolution, and Ecology
BIOHOPK 150H	Ecological Mechanics
BIOHOPK 152H	Physiology of Global Change
BIOHOPK 153H	Current Topics and Concepts in Quantitative Fish Dynamics and Fisheries Management
BIOHOPK 155H	Developmental Biology and Evolution
BIOHOPK 160H	Developmental Biology in the Ocean: Diverse Embryonic & Larval Strategies of marine invertebrates
BIOHOPK 161H	Invertebrate Zoology
BIOHOPK 162H	Comparative Animal Physiology
BIOHOPK 163H	Oceanic Biology
BIOHOPK 165H	The Extreme Life of the Sea
BIOHOPK 166H	Molecular Ecology
BIOHOPK 167H	Nerve, Muscle, and Synapse
BIOHOPK 168H	Disease Ecology: from parasites evolution to the socio-economic impacts of pathogens on nations
BIOHOPK 172H	Marine Ecology: From Organisms to Ecosystems
BIOHOPK 173H	Marine Conservation Biology
BIOHOPK 174H	Experimental Design and Probability
BIOHOPK 177H	Dynamics and Management of Marine Populations
BIOHOPK 179H	Physiological Ecology of Marine Megafauna
BIOHOPK 180H	Air and Water
BIOHOPK 181H	Physiology of Global Change
BIOHOPK 182H	Stanford at Sea
BIOHOPK 184H	Holistic Biology
BIOHOPK 185H	Ecology and Conservation of Kelp Forest Communities
BIOHOPK 187H	Sensory Ecology
BIOHOPK 189H	Sustainability and Marine Ecosystems
BIOHOPK 198H	Directed Instruction or Reading
BIOHOPK 199H	Undergraduate Research
BIOHOPK 250H	Ecological Mechanics
BIOHOPK 252H	Physiology of Global Change
BIOHOPK 253H	Current Topics and Concepts in Quantitative Fish Dynamics and Fisheries Management
BIOHOPK 255H	Developmental Biology and Evolution
BIOHOPK 260H	Developmental Biology in the Ocean: Diverse Embryonic & Larval Strategies of marine invertebrates
BIOHOPK 261H	Invertebrate Zoology
BIOHOPK 262H	Comparative Animal Physiology
BIOHOPK 263H	Oceanic Biology
BIOHOPK 264H	POPULATION GENOMICS
BIOHOPK 266H	Molecular Ecology
BIOHOPK 267H	Nerve, Muscle, and Synapse
BIOHOPK 268H	Disease Ecology: from parasites evolution to the socio-economic impacts of pathogens on nations
BIOHOPK 272H	Marine Ecology: From Organisms to Ecosystems
BIOHOPK 273H	Marine Conservation Biology
BIOHOPK 274	Hopkins Microbiology Course
BIOHOPK 274H	Experimental Design and Probability
BIOHOPK 275H	Synthesis in Ecology
BIOHOPK 276H	Estimates and Errors: The Theory of Scientific Measurement
BIOHOPK 277H	Dynamics and Management of Marine Populations
BIOHOPK 279H	Physiological Ecology of Marine Megafauna
BIOHOPK 280	Short Course on Ocean Policy
BIOHOPK 280H	Air and Water
BIOHOPK 284H	Holistic Biology
BIOHOPK 285H	Ecology and Conservation of Kelp Forest Communities
BIOHOPK 287H	Sensory Ecology
BIOHOPK 289H	Sustainability and Marine Ecosystems
BIOHOPK 300H	Research
BIOHOPK 320H	Physical Biology
BIOHOPK 323H	Stanford at Sea
BIOMEDIN 156	Economics of Health and Medical Care
BIOMEDIN 256	Economics of Health and Medical Care
CEE 1	Introduction to Environmental Systems Engineering
CEE 29N	Managing Natural Disaster Risk
CEE 50N	Multi-Disciplinary Perspectives on a Large Urban Estuary: San Francisco Bay
CEE 63	Weather and Storms
CEE 64	Air Pollution and Global Warming: History, Science, and Solutions
CEE 70	Environmental Science and Technology
CEE 70N	Water, Public Health, and Engineering
CEE 73	Water: An Introduction
CEE 100	Managing Sustainable Building Projects
CEE 101B	Mechanics of Fluids
CEE 101D	Computations in Civil and Environmental Engineering
CEE 107A	Understanding Energy
CEE 107S	Energy Resources: Fuels and Tools
CEE 112A	Industry Applications of Virtual Design & Construction
CEE 112B	Industry Applications of Virtual Design & Construction
CEE 112C	Industry Applications of Virtual Design & Construction
CEE 113	Patterns of Sustainability
CEE 124	Sustainable Development Studio
CEE 125	Defining Smart Cities: Visions of Urbanism for the 21st Century
CEE 126	International Urbanization Seminar: Cross-Cultural Collaboration for Sustainable Urban Development
CEE 129S	Climate Change Adaptation in the Coastal Built Environment
CEE 131B	Financial Management of Sustainable Urban Systems
CEE 151	Negotiation
CEE 155	Introduction to Sensing Networks for CEE
CEE 156	Building Systems
CEE 165C	Water Resources Management
CEE 166A	Watersheds and Wetlands
CEE 166B	Floods and Droughts, Dams and Aqueducts
CEE 166D	Water Resources and Water Hazards Field Trips
CEE 169	Environmental and Water Resources Engineering Design
CEE 171	Environmental Planning Methods
CEE 171F	New Indicators of Well-Being and Sustainability
CEE 172	Air Quality Management
CEE 172A	Indoor Air Quality

CEE 174A	Providing Safe Water for the Developing and Developed World
CEE 174B	Wastewater Treatment: From Disposal to Resource Recovery
CEE 175A	California Coast: Science, Policy, and Law
CEE 175S	Environmental Entrepreneurship and Innovation
CEE 176A	Energy Efficient Buildings
CEE 176B	Electric Power: Renewables and Efficiency
CEE 176C	Energy Storage Integration - Vehicles, Renewables, and the Grid
CEE 177	Aquatic Chemistry and Biology
CEE 177L	Smart Cities & Communities
CEE 177S	Design for a Sustainable World
CEE 177X	Current Topics in Sustainable Engineering
CEE 178	Introduction to Human Exposure Analysis
CEE 179A	Water Chemistry Laboratory
CEE 179C	Environmental Engineering Design
CEE 179S	Seminar: Issues in Environmental Science, Technology and Sustainability
CEE 195	Fundamentals of Structural Geology
CEE 196	Engineering Geology and Global Change
CEE 201D	Computations in Civil and Environmental Engineering
CEE 206	Decision Analysis for Civil and Environmental Engineers
CEE 207A	Understanding Energy
CEE 207S	Energy Resources: Fuels and Tools
CEE 213	Patterns of Sustainability
CEE 217	Renewable Energy Infrastructure
CEE 223	Materials for Sustainable Built Environments
CEE 224A	Sustainable Development Studio
CEE 225	Defining Smart Cities: Visions of Urbanism for the 21st Century
CEE 226	Life Cycle Assessment for Complex Systems
CEE 226E	Advanced Topics in Integrated, Energy-Efficient Building Design
CEE 227	Global Project Finance
CEE 229S	Climate Change Adaptation in the Coastal Built Environment
CEE 251	Negotiation
CEE 255	Introduction to Sensing Networks for CEE
CEE 256	Building Systems
CEE 260A	Physical Hydrogeology
CEE 260C	Contaminant Hydrogeology and Reactive Transport
CEE 262A	Hydrodynamics
CEE 262B	Transport and Mixing in Surface Water Flows
CEE 262C	Hydrodynamics and Sediment Transport Modeling
CEE 262D	Introduction to Physical Oceanography
CEE 262F	Ocean Waves
CEE 263A	Air Pollution Modeling
CEE 263B	Numerical Weather Prediction
CEE 263C	Weather and Storms
CEE 263D	Air Pollution and Global Warming: History, Science, and Solutions
CEE 263S	Atmosphere/Energy Seminar
CEE 265A	Sustainable Water Resources Development
CEE 265C	Water Resources Management
CEE 265D	Water and Sanitation in Developing Countries
CEE 266A	Watersheds and Wetlands
CEE 266B	Floods and Droughts, Dams and Aqueducts
CEE 266C	Advanced Topics in Hydrology and Water Resources
CEE 266D	Water Resources and Water Hazards Field Trips
CEE 268	Groundwater Flow
CEE 269A	Environmental Engineering Seminar
CEE 269B	Environmental Engineering Seminar
CEE 269C	Environmental Engineering Seminar
CEE 270	Movement and Fate of Organic Contaminants in Waters
CEE 270B	Environmental Organic Reaction Chemistry
CEE 271A	Physical and Chemical Treatment Processes
CEE 271B	Environmental Biotechnology
CEE 271D	Introduction to Wastewater Treatment Process Modeling
CEE 271F	New Indicators of Well-Being and Sustainability
CEE 272	Coastal Contaminants
CEE 272R	Modern Power Systems Engineering
CEE 272T	SmartGrids and Advanced Power Systems Seminar
CEE 273	Aquatic Chemistry
CEE 273A	Water Chemistry Laboratory
CEE 273D	Wastewater Treatment Process Simulators and Their Use for Emerging Technologies
CEE 274A	Environmental Microbiology I
CEE 274B	Microbial Bioenergy Systems
CEE 274D	Pathogens and Disinfection
CEE 274P	Environmental Health Microbiology Lab
CEE 274S	Hopkins Microbiology Course
CEE 275A	California Coast: Science, Policy, and Law
CEE 275B	Process Design for Environmental Biotechnology
CEE 275C	Water, Sanitation and Health
CEE 275K	The Practice of Environmental Consulting
CEE 275S	Environmental Entrepreneurship and Innovation
CEE 276	Introduction to Human Exposure Analysis
CEE 276C	Energy Storage Integration - Vehicles, Renewables, and the Grid
CEE 277D	Water, Health & Development in Africa
CEE 277F	Advanced Field Methods in Water, Health and Development
CEE 277L	Smart Cities & Communities
CEE 277S	Design for a Sustainable World
CEE 277X	Current Topics in Sustainable Engineering
CEE 278A	Air Pollution Fundamentals
CEE 278C	Indoor Air Quality
CEE 279S	Seminar: Issues in Environmental Science, Technology and Sustainability
CEE 279W	Innovation in Water Sector
CEE 287	Earthquake Resistant Design and Construction
CEE 288	Introduction to Performance Based Earthquake Engineering
CEE 293	Foundations and Earth Structures
CEE 301	The Energy Seminar
CEE 316	Sustainable Built Environment Research
CEE 363C	Ocean and Estuarine Modeling
CEE 363F	Oceanic Fluid Dynamics

CEE 363G	Field Techniques in Coastal Oceanography
CEE 364F	Advanced Topics in Geophysical Fluid Dynamics
CEE 365A	Advanced Topics in Environmental Fluid Mechanics and Hydrology
CEE 365B	Advanced Topics in Environmental Fluid Mechanics and Hydrology
CEE 365C	Advanced Topics in Environmental Fluid Mechanics and Hydrology
CEE 365D	Advanced Topics in Environmental Fluid Mechanics and Hydrology
CEE 370A	Environmental Research
CEE 370B	Environmental Research
CEE 370C	Environmental Research
CEE 370D	Environmental Research
CEE 374A	Introduction to Physiology of Microbes in Biofilms
CEE 374B	Introduction to Physiology of Microbes in Biofilms
CEE 374C	Introduction to Physiology of Microbes in Biofilms
CEE 374D	Introduction to Physiology of Microbes in Biofilms
CEE 374S	Advanced Topics in Microbial Pollution
CEE 374T	Advanced Topics in Coastal Pollution
CEE 374U	Advanced Topics in Submarine Groundwater Discharge
CEE 374V	Advanced Topics in Microbial Source Tracking
CEE 374W	Advanced Topics in Water, Health and Development
CEE 377	Research Proposal Writing in Environmental Engineering and Science
CEE 385	Performance-Based Earthquake Engineering
CHEM 10	Exploring Research and Problem Solving Across the Sciences
CHEM 25N	Science in the News
CHEM 28N	Science Innovation and Communication
CHEM 459	Frontiers in Interdisciplinary Biosciences
CHEMENG 25E	Energy: Chemical Transformations for Production, Storage, and Use
CHEMENG 35N	Renewable Energy for a Sustainable World
CHEMENG 60Q	Environmental Regulation and Policy
CHEMENG 70Q	Masters of Disaster
CHEMENG 162	Polymers for Clean Energy and Water
CHEMENG 174	Environmental Microbiology I
CHEMENG 262	Polymers for Clean Energy and Water
CHEMENG 274	Environmental Microbiology I
CHEMENG 432	Electrochemical Energy Conversion
CHEMENG 456	Microbial Bioenergy Systems
CHEMENG 459	Frontiers in Interdisciplinary Biosciences
CLASSICS 121	Ecology in Philosophy and Literature
CLASSICS 358	The Archaeology of Ancient Mediterranean Environments
CME 211	Software Development for Scientists and Engineers
COMM 1B	Media, Culture, and Society
COMM 104W	Reporting, Writing, and Understanding the News
COMM 108	Media Processes and Effects
COMM 172	Media Psychology
COMM 177C	Specialized Writing and Reporting: Environmental Journalism
COMM 272	Media Psychology
COMM 277C	Specialized Writing and Reporting: Environmental Journalism
COMPMED 84Q	Globally Emerging Zoonotic Diseases
CSRE 109A	Federal Indian Law
CSRE 109B	Indian Country Economic Development
CSRE 156J	Environment, Nature and Race
CSRE 178	Ethics and Politics of Public Service
CSRE 187A	The Anthropology of Race, Nature, and Animality
EARTH 1	Current Research in the Earth and Environmental Sciences
EARTH 1A	Know Your Planet: Research Frontiers
EARTH 1B	Know Your Planet: Big Earth
EARTH 1C	Know Your Planet: Science Outside
EARTH 2	Climate and Society
EARTH 5	Geokids: Earth Sciences Education
EARTH 14	Our National Parks
EARTH 15	Living on the Edge
EARTH 100	Research Preparation for Undergraduates
EARTH 114A	Our National Parks
EARTH 117	Earth Sciences of the Hawaiian Islands
EARTH 126X	Hard Earth: Stanford Graduate-Student Talks Exploring Tough Environmental Dilemmas
EARTH 126Y	Hard Earth: Stanford Graduate-Student Talks Exploring Tough Environmental Dilemmas
EARTH 131	Pathways in Sustainability Careers
EARTH 191	Stanford EARTH Field Courses
EARTH 193	Natural Perspectives: Geology, Environment, and Art
EARTH 202	PhD Students on the PhD
EARTH 211	Software Development for Scientists and Engineers
EARTH 214	Software Design in Modern Fortran for Scientists and Engineers
EARTH 218	Communicating Science
EARTH 219	OPINION WRITING IN THE SCIENCES
EARTH 251	Negotiation
EARTH 300	Earth Sciences Seminar
EARTH 310	Computational Geosciences Seminar
EARTHSYS 4	Coevolution of Earth and Life
EARTHSYS 8	The Oceans: An Introduction to the Marine Environment
EARTHSYS 9	Public Service Internship Preparation
EARTHSYS 10	Introduction to Earth Systems
EARTHSYS 12SE	Environmental and Geological Field Studies in the Rocky Mountains
EARTHSYS 13S	People, Land, and Water in the Heart of the West
EARTHSYS 18	Promoting Sustainability Behavior Change at Stanford
EARTHSYS 21	Peopling of the Globe: Changing Patterns of Land Use and Consumption Over the Last 50,000 Years
EARTHSYS 36N	Life at the Extremes: From the Deep Sea to Deep Space
EARTHSYS 37N	Climate Change: Science & Society
EARTHSYS 38N	The Worst Journey in the World: The Science, Literature, and History of Polar Exploration
EARTHSYS 39N	The Carbon Cycle: Reducing Your Impact
EARTHSYS 41N	The Global Warming Paradox
EARTHSYS 42	The Global Warming Paradox II
EARTHSYS 44N	The Invisible Majority: The Microbial World That Sustains Our Planet

EARTHSYS 46N	Exploring the Critical Interface between the Land and Monterey Bay: Elkhorn Slough
EARTHSYS 46Q	Environmental Impact of Energy Systems: What are the Risks?
EARTHSYS 49N	Multi-Disciplinary Perspectives on a Large Urban Estuary: San Francisco Bay
EARTHSYS 56Q	Changes in the Coastal Ocean: The View From Monterey and San Francisco Bays
EARTHSYS 57C	Climate Change from the Past to the Future
EARTHSYS 61Q	Food and security
EARTHSYS 100	Environmental and Geological Field Studies in the Rocky Mountains
EARTHSYS 101	Energy and the Environment
EARTHSYS 102	Fundamentals of Renewable Power
EARTHSYS 103	Understanding Energy
EARTHSYS 104	The Water Course
EARTHSYS 105	Food and Community: Food Security, Resilience and Equity
EARTHSYS 105	Ecology and Natural History of Jasper Ridge Biological Preserve
EARTHSYS 105E	Ecology and Natural History of Jasper Ridge Biological Preserve
EARTHSYS 106	World Food Economy
EARTHSYS 107	Control of Nature
EARTHSYS 110	Introduction to the foundations of contemporary geophysics
EARTHSYS 111	Biology and Global Change
EARTHSYS 112	Human Society and Environmental Change
EARTHSYS 113	Earthquakes and Volcanoes
EARTHSYS 115	Wetlands Ecology of the Pantanal Prefield Seminar
EARTHSYS 115T	Island Biogeography of Tasmania Prefield Seminar
EARTHSYS 116	Ecology of the Hawaiian Islands
EARTHSYS 117	Earth Sciences of the Hawaiian Islands
EARTHSYS 118	Heritage, Environment, and Sovereignty in Hawaii
EARTHSYS 119	Will Work for Food
EARTHSYS 121	Building a Sustainable Society: New Approaches for Integrating Human and Environmental Priorities
EARTHSYS 122	Evolution of Marine Ecosystems
EARTHSYS 125	Shades of Green: Redesigning and Rethinking the Environmental Justice Movements
EARTHSYS 128	Evolution of Terrestrial Ecosystems
EARTHSYS 129	Geographic Impacts of Global Change: Mapping the Stories
EARTHSYS 131	Pathways in Sustainability Careers
EARTHSYS 132	Evolution of Earth Systems
EARTHSYS 133	Social Entrepreneurship Collaboratory
EARTHSYS 135	Podcasting the Anthropocene
EARTHSYS 135A	Podcasting the Anthropocene 1.0
EARTHSYS 136	The Ethics of Stewardship
EARTHSYS 138	International Urbanization Seminar: Cross-Cultural Collaboration for Sustainable Urban Development
EARTHSYS 140	The Energy-Water Nexus
EARTHSYS 141	Remote Sensing of the Oceans
EARTHSYS 142	Remote Sensing of Land
EARTHSYS 144	Fundamentals of Geographic Information Science (GIS)
EARTHSYS 146	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation
EARTHSYS 146B	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation
EARTHSYS 148	Grow it, Cook it, Eat it. An Experiential Exploration of How and Why We Eat What We Eat
EARTHSYS 149	Wild Writing
EARTHSYS 151	Biological Oceanography
EARTHSYS 152	Marine Chemistry
EARTHSYS 155	Science of Soils
EARTHSYS 158	Geomicrobiology
EARTHSYS 160	Sustainable Cities
EARTHSYS 164	Introduction to Physical Oceanography
EARTHSYS 170	Environmental Geochemistry
EARTHSYS 172	Australian Ecosystems: Human Dimensions and Environmental Dynamics
EARTHSYS 175	California Coast: Science, Policy, and Law
EARTHSYS 176	Open Space Management Practicum
EARTHSYS 176	Open Space Practicum Independent Study
EARTHSYS 177C	Specialized Writing and Reporting: Environmental Journalism
EARTHSYS 179	Seminar: Issues in Environmental Science, Technology and Sustainability
EARTHSYS 180	Principles and Practices of Sustainable Agriculture
EARTHSYS 181	Urban Agriculture in the Developing World
EARTHSYS 182	Designing Educational Gardens
EARTHSYS 183	Food Matters: Agriculture in Film
EARTHSYS 185	Feeding Nine Billion
EARTHSYS 186	Farm and Garden Environmental Education Practicum
EARTHSYS 187	FEED the Change: Redesigning Food Systems
EARTHSYS 188	Social and Environmental Tradeoffs in Climate Decision-Making
EARTHSYS 191	Concepts in Environmental Communication
EARTHSYS 199	Honors Program in Earth Systems
EARTHSYS 200	Environmental Communication in Action: The SAGE Project
EARTHSYS 201	Editing for Publication
EARTHSYS 206	World Food Economy
EARTHSYS 207	Spanish in Science/Science in Spanish
EARTHSYS 210S	Senior Capstone and Reflection
EARTHSYS 210	Senior Capstone and Reflection
EARTHSYS 210P	Earth Systems Capstone Project
EARTHSYS 211	Fundamentals of Modeling
EARTHSYS 219	Will Work for Food
EARTHSYS 225	Shades of Green: Redesigning and Rethinking the Environmental Justice Movements
EARTHSYS 232	Evolution of Earth Systems
EARTHSYS 235	Podcasting the Anthropocene
EARTHSYS 235A	Podcasting the Anthropocene 1.0
EARTHSYS 236	The Ethics of Stewardship
EARTHSYS 238	Land Use Law
EARTHSYS 241	Remote Sensing of the Oceans
EARTHSYS 242	Remote Sensing of Land
EARTHSYS 243	Environmental Advocacy and Policy Communication
EARTHSYS 246A	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation
EARTHSYS 246	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation
EARTHSYS 249	Wild Writing

EARTHSYS 250	Directed Research
EARTHSYS 251	Biological Oceanography
EARTHSYS 252	Marine Chemistry
EARTHSYS 255	Microbial Physiology
EARTHSYS 256	Soil and Water Chemistry
EARTHSYS 258	Geomicrobiology
EARTHSYS 260	Internship
EARTHSYS 263	Groundwork for COP21
EARTHSYS 272	Antarctic Marine Geology
EARTHSYS 275	California Coast: Science, Policy, and Law
EARTHSYS 276	Open Space Management Practicum
EARTHSYS 276A	Open Space Practicum Independent Study
EARTHSYS 277	Specialized Writing and Reporting: Environmental Journalism
EARTHSYS 281	Urban Agriculture in the Developing World
EARTHSYS 283	Food Matters: Agriculture in Film
EARTHSYS 286	Farm and Garden Environmental Education Practicum
EARTHSYS 288	Social and Environmental Tradeoffs in Climate Decision-Making
EARTHSYS 289A	FEED Lab: Food System Design & Innovation
EARTHSYS 289	FEED Lab: Food System Design & Innovation
EARTHSYS 290	Master's Seminar
EARTHSYS 291	Concepts in Environmental Communication
EARTHSYS 292	Multimedia Environmental Communication
EARTHSYS 293	Environmental Communication Practicum
EARTHSYS 294	Environmental Communication Capstone
EARTHSYS 297	Directed Individual Study in Earth Systems
EARTHSYS 298	Earth Systems Book Review
EARTHSYS 299	M.S. Thesis
EARTHSYS 323	Stanford at Sea
EASTASN 94	The Rise of China in World Affairs
EASTASN 117	Health and Healthcare Systems in East Asia
EASTASN 217	Health and Healthcare Systems in East Asia
EASTASN 294	The Rise of China in World Affairs
ECON 17N	Energy, the Environment, and the Economy
ECON 106	World Food Economy
ECON 118	Development Economics
ECON 126	Economics of Health and Medical Care
ECON 127	Economics of Health Improvement in Developing Countries
ECON 155	Environmental Economics and Policy
ECON 159	Economic, Legal, and Political Analysis of Climate-Change Policy
ECON 206	World Food Economy
ECON 214	Development Economics I
ECON 216	Development Economics III
ECON 250	Environmental Economics
ECON 251	Natural Resource and Energy Economics
ECON 253	Energy Markets: Theory and Evidence from Latin America
ECON 341	Public Economics and Environmental Economics Seminar
EDUC 100A	EAST House Seminar: Current Issues and Debates in Education
EDUC 126A	Introduction to Public Service Leadership
EDUC 126B	Public Service Leadership Program Practicum
EDUC 139	Educating Young STEM Thinkers
EDUC 239	Educating Young STEM Thinkers
EDUC 267A	Curriculum and Instruction in Science
EDUC 267B	Curriculum and Instruction in Science
EDUC 267C	Curriculum and Instruction in Science
EDUC 267E	Development of Scientific Reasoning and Knowledge
EDUC 267F	Development of Scientific Reasoning and Knowledge II
EDUC 267G	Integrating the Garden into the Elementary Curriculum
EDUC 280	Learning & Teaching of Science
EDUC 302	Behavior Design
EDUC 320	Sociology of Science
EDUC 332	Theory and Practice of Environmental Education
EDUC 357	Science and Environmental Education in Informal Contexts
EDUC 359C	Science Literacy
EDUC 362	The Science Curriculum: Values and Ideology in a Contested Terrain
EE 60N	Man versus Nature: Coping with Disasters Using Space Technology
EE 151	Sustainable Energy Systems
EE 155	Green Electronics
EE 255	Green Electronics
EE 292H	Engineering, Entrepreneurship & Climate Change
EE 293A	Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution
EE 293B	Fundamentals of Energy Processes
EEES 302	Challenges and Practices in Crossdisciplinary Research and Teaching
ENERGY 101	Energy and the Environment
ENERGY 101A	Energizing California
ENERGY 102	Fundamentals of Renewable Power
ENERGY 104	Sustainable Energy for 9 Billion
ENERGY 110	Engineering Economics
ENERGY 120	Fundamentals of Petroleum Engineering
ENERGY 120A	Flow Through Porous Media Laboratory
ENERGY 121	Fundamentals of Multiphase Flow
ENERGY 122	Lunch with Numerics
ENERGY 123	When Technology Meets Reality; An In-depth Look at the Deepwater Horizon Blowout and Oil Spill
ENERGY 130	Well Log Analysis I
ENERGY 141	Seismic Reservoir Characterization
ENERGY 146	Reservoir Characterization and Flow Modeling with Outcrop Data
ENERGY 153	Carbon Capture and Sequestration
ENERGY 155	Undergraduate Report on Energy Industry Training
ENERGY 158	Bringing New Energy Technologies to Market: Optimizing Technology Push and Market Pull
ENERGY 160	Modeling Uncertainty in the Earth Sciences
ENERGY 167	Engineering Valuation and Appraisal of Oil and Gas Wells, Facilities, and Properties
ENERGY 171	Energy Infrastructure, Technology and Economics
ENERGY 175	Well Test Analysis
ENERGY 180	Oil and Gas Production Engineering
ENERGY 191	Optimization of Energy Systems
ENERGY 192	Undergraduate Teaching Experience
ENERGY 193	Undergraduate Research Problems
ENERGY 194	Special Topics in Energy and Mineral Fluids

ENERGY 199	Senior Project and Seminar in Energy Resources
ENERGY 201	Laboratory Measurement of Reservoir Rock Properties
ENERGY 203	The Energy Transformation Collaborative
ENERGY 214	The Global Price of Oil
ENERGY 216	Entrepreneurship in Energy
ENERGY 217	Research Seminar: Energy Development in the Emerging Economy
ENERGY 221	Fundamentals of Multiphase Flow
ENERGY 222	Advanced Reservoir Engineering
ENERGY 223	Reservoir Simulation
ENERGY 224	Advanced Reservoir Simulation
ENERGY 225	Theory of Gas Injection Processes
ENERGY 227	Enhanced Oil Recovery
ENERGY 230	Advanced Topics in Well Logging
ENERGY 240	Data science for geoscience
ENERGY 241	Seismic Reservoir Characterization
ENERGY 246	Reservoir Characterization and Flow Modeling with Outcrop Data
ENERGY 251	Thermodynamics of Equilibria
ENERGY 253	Carbon Capture and Sequestration
ENERGY 267	Engineering Valuation and Appraisal of Oil and Gas Wells, Facilities, and Properties
ENERGY 269	Geothermal Reservoir Engineering
ENERGY 271	Energy Infrastructure, Technology and Economics
ENERGY 273	Special Topics in Energy Resources Engineering
ENERGY 274	Complex Analysis for Practical Engineering
ENERGY 275	Quantitative Methods in Basin and Petroleum System Modeling
ENERGY 280	Oil and Gas Production Engineering
ENERGY 291	Optimization of Energy Systems
ENERGY 293A	Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution
ENERGY 293B	Fundamentals of Energy Processes
ENERGY 293C	Energy from Wind and Water Currents
ENERGY 301	The Energy Seminar
ENERGY 359	Teaching Experience in Energy Resources Engineering
ENERGY 360	Advanced Research Work in Energy Resources Engineering
ENERGY 361	Master's Degree Research in Energy Resources Engineering
ENGLISH 124	The American West
ENGR 25E	Energy: Chemical Transformations for Production, Storage, and Use
ENGR 90	Environmental Science and Technology
ENGR 113A	Solar Decathlon 2015
ENGR 113B	Solar Decathlon 2015
ENGR 113C	Solar Decathlon 2015
ENGR 113D	SOLAR DECATHLON 2015
ENGR 120	Fundamentals of Petroleum Engineering
ENGR 213	Solar Decathlon
ENGR 213A	Solar Decathlon 2015
ENGR 213B	Solar Decathlon 2015
ENGR 213C	Solar Decathlon 2015
ENGR 213D	SOLAR DECATHLON 2015
ENVRES 220	The Social Ocean: Ocean Conservation, Management, and Policy
ENVRES 225	E-IPER Current Topics Seminar
ENVRES 230	Field Survey Data Collection & Analysis
ENVRES 240	Environmental Decision-Making and Risk Perception
ENVRES 250	Environmental Governance
ENVRES 270	Graduate Practicum in Environment and Resources
ENVRES 276	Water Resources: Culture and Context
ENVRES 280	Introduction to Environmental Science
ENVRES 290	Capstone Project Seminar in Environment and Resources
ENVRES 300	Introduction to Resource, Energy and Environmental Economics
ENVRES 315	Environmental Research Design Seminar
ENVRES 320	Designing Environmental Research
ENVRES 330	Research Approaches for Environmental Problem Solving
ENVRES 380	Collaborating with the Future: Launching Large Scale Sustainable Transformations
ENVRES 398	Directed Reading in Environment and Resources
ENVRES 399	Directed Research in Environment and Resources
ENVRINST 198	Prehonors Seminar
ENVRINST 199	Interschool Honors Program in Environmental Science, Technology, and Policy
ENVRINST 260	Water in the West: Challenges and Opportunities
ESS 8	The Oceans: An Introduction to the Marine Environment
ESS 10SC	In the Age of the Anthropocene: Coupled-Human Natural Systems of Southeast Alaska
ESS 12SC	Environmental and Geological Field Studies in the Rocky Mountains
ESS 38N	The Worst Journey in the World: The Science, Literature, and History of Polar Exploration
ESS 42	The Global Warming Paradox II
ESS 43	The Global Warming Paradox III
ESS 46N	Exploring the Critical Interface between the Land and Monterey Bay: Elkhorn Slough
ESS 49N	Multi-Disciplinary Perspectives on a Large Urban Estuary: San Francisco Bay
ESS 56Q	Changes in the Coastal Ocean: The View From Monterey and San Francisco Bays
ESS 57Q	Climate Change from the Past to the Future
ESS 60	Food, Water and War: Life on the Mekong
ESS 61Q	Food and security
ESS 101	Environmental and Geological Field Studies in the Rocky Mountains
ESS 106	World Food Economy
ESS 107	Control of Nature
ESS 111	Biology and Global Change
ESS 112	Human Society and Environmental Change
ESS 117	Earth Sciences of the Hawaiian Islands
ESS 118	D^3: Disasters, Decisions, Development
ESS 132	Evolution of Earth Systems
ESS 135	Community Leadership
ESS 141	Remote Sensing of the Oceans
ESS 146A	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation
ESS 146B	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation

ESS 148	Introduction to Physical Oceanography
ESS 151	Biological Oceanography
ESS 152	Marine Chemistry
ESS 155	Science of Soils
ESS 158	Geomicrobiology
ESS 162	Remote Sensing of Land
ESS 164	Fundamentals of Geographic Information Science (GIS)
ESS 165	Advanced Geographic Information Systems
ESS 179S	Seminar: Issues in Environmental Science, Technology and Sustainability
ESS 181	Urban Agriculture in the Developing World
ESS 183	Food Matters: Agriculture in Film
ESS 206	World Food Economy
ESS 208	Topics in Geobiology
ESS 210	Techniques in Environmental Microbiology
ESS 211	Fundamentals of Modeling
ESS 212	Measurements in Earth Systems
ESS 214	Introduction to geostatistics and modeling of spatial uncertainty
ESS 215	Earth System Dynamics
ESS 216	Terrestrial Biogeochemistry
ESS 217	Climate of the Cenozoic
ESS 218	D^3: Disasters, Decisions, Development
ESS 219	Climate Variability during the Holocene: Understanding what is Natural Climate Change
ESS 220	Physical Hydrogeology
ESS 221	Contaminant Hydrogeology and Reactive Transport
ESS 232	Evolution of Earth Systems
ESS 240	Advanced Oceanography
ESS 241	Remote Sensing of the Oceans
ESS 242	Antarctic Marine Geology
ESS 244	Marine Ecosystem Modeling
ESS 245	Advanced Biological Oceanography
ESS 246A	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation
ESS 246B	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation
ESS 249	Marine Stable Isotopes
ESS 250	Elkhorn Slough Microbiology
ESS 251	Biological Oceanography
ESS 252	Marine Chemistry
ESS 253S	Hopkins Microbiology Course
ESS 255	Microbial Physiology
ESS 256	Soil and Water Chemistry
ESS 258	Geomicrobiology
ESS 259	Environmental Microbial Genomics
ESS 260	Advanced Statistical Methods for Earth System Analysis
ESS 261	Molecular Microbial Biosignatures
ESS 262	Remote Sensing of Land
ESS 263	Topics in Advanced Geostatistics
ESS 265	Advanced Geographic Information Systems
ESS 270	Analyzing land use in a globalized world
ESS 280	Principles and Practices of Sustainable Agriculture
ESS 281	Urban Agriculture in the Developing World
ESS 282	Designing Educational Gardens
ESS 283	Food Matters: Agriculture in Film
ESS 292	Directed Individual Study in Earth System Science
ESS 300	Climate studies of terrestrial environments
ESS 301	Topics in Earth System Science
ESS 305	Climate Change: An Earth Systems Perspective
ESS 306	From Freshwater to Oceans to Land Systems: An Earth System Perspective to Global Challenges
ESS 307	Research Proposal Development and Delivery
ESS 310	Climate and Energy Seminar
ESS 311	Seminar in Advanced Applications of Remote Sensing
ESS 318	Global Land Use Change to 2050
ESS 322A	Seminar in Hydrogeology
ESS 322B	Seminar in Hydrogeology
ESS 323	Stanford at Sea
ESS 330	Advanced Topics in Hydrogeology
ESS 342	Geostatistics
ESS 342B	Geostatistics
ESS 342C	Geostatistics
ESS 360	Social Structure and Social Networks
ESS 363	Demography and Life History Theory
ESS 363F	Oceanic Fluid Dynamics
ESS 364F	Advanced Topics in Geophysical Fluid Dynamics
ESS 385	Practical Experience in the Geosciences
ESS 398	Current Topics in Ecosystem Modeling
ESS 400	Graduate Research
ETHICSOC 133	Ethics and Politics of Public Service
ETHICSOC 136R	Introduction to Global Justice
ETHICSOC 174A	Moral Limits of the Market
ETHICSOC 178N	Introduction to Environmental Ethics
ETHICSOC 180I	The Ethics and Politics of Collective Action
ETHICSOC 185M	Contemporary Moral Problems
ETHICSOC 278I	Introduction to Environmental Ethics
FEMGEN 129	Critical Issues in International Women's Health
GEOPHYS 20N	Predicting Volcanic Eruptions
GEOPHYS 50N	Planetary Habitability, World View, and Sustainability
GEOPHYS 60N	Man versus Nature: Coping with Disasters Using Space Technology
GEOPHYS 70	The Water Course
GEOPHYS 80	The Energy-Water Nexus
GEOPHYS 90	Earthquakes and Volcanoes
GEOPHYS 110	Introduction to the foundations of contemporary geophysics
GEOPHYS 112	Exploring Geosciences with MATLAB
GEOPHYS 118	D^3: Disasters, Decisions, Development
GEOPHYS 120	Ice, Water, Fire
GEOPHYS 130	Introductory Seismology
GEOPHYS 141	Remote Sensing of the Oceans
GEOPHYS 146A	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation
GEOPHYS 150	Geodynamics: Our Dynamic Earth
GEOPHYS 160	D^3: Disasters, Decisions, Development
GEOPHYS 162	Laboratory Methods in Geophysics
GEOPHYS 171	Tectonics Field Trip
GEOPHYS 181	Fluids and Flow in the Earth: Computational Methods
GEOPHYS 182	Reflection Seismology

GEOPHYS 183	Reflection Seismology Interpretation
GEOPHYS 184	Journey to the Center of the Earth
GEOPHYS 185	Rock Physics for Reservoir Characterization
GEOPHYS 186	Tectonophysics
GEOPHYS 190	Near-Surface Geophysics
GEOPHYS 191	Observing Freshwater
GEOPHYS 196	Undergraduate Research in Geophysics
GEOPHYS 201	Frontiers of Geophysical Research at Stanford: Faculty Lectures
GEOPHYS 202	Reservoir Geomechanics
GEOPHYS 203	Fluids and Flow in the Earth: Computational Methods
GEOPHYS 205	Effective Scientific Presentation and Public Speaking
GEOPHYS 206	FLUID DYNAMICS OF THE SOLID EA
GEOPHYS 208	Unconventional Reservoir Geomechanics
GEOPHYS 210	Basic Earth Imaging
GEOPHYS 211	Environmental Soundings Image Estimation
GEOPHYS 212	Topics in Climate Change
GEOPHYS 217	Numerical Methods in Engineering and Applied Sciences
GEOPHYS 218	D^3: Disasters, Decisions, Development
GEOPHYS 220	Ice, Water, Fire
GEOPHYS 222	Reflection Seismology
GEOPHYS 223	Reflection Seismology Interpretation
GEOPHYS 224	Seismic Reflection Processing
GEOPHYS 229	Earthquake Rupture Dynamics
GEOPHYS 235	WAVES AND FIELDS IN GEOPHYSICS
GEOPHYS 240	Borehole Seismic Modeling and Imaging
GEOPHYS 241A	Seismic Reservoir Characterization
GEOPHYS 246A	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation
GEOPHYS 255	Report on Energy Industry Training
GEOPHYS 257	Introduction to Computational Earth Sciences
GEOPHYS 259	Laboratory Methods in Geophysics
GEOPHYS 260	Rock Physics for Reservoir Characterization
GEOPHYS 262	Rock Physics
GEOPHYS 265	Imaging Radar and Applications
GEOPHYS 270	Electromagnetic Properties of Geological Materials
GEOPHYS 274	Journey to the Center of the Earth
GEOPHYS 280	3-D Seismic Imaging
GEOPHYS 281	Geophysical Inverse Problems
GEOPHYS 284	Hydrogeophysics
GEOPHYS 287	Earthquake Seismology
GEOPHYS 288A	Crustal Deformation
GEOPHYS 288B	Crustal Deformation
GEOPHYS 289	Global Positioning System in Earth Sciences
GEOPHYS 290	Tectonophysics
GEOPHYS 385A	Reflection Seismology
GEOPHYS 385B	Environmental Geophysics
GEOPHYS 385D	Theoretical Geophysics
GEOPHYS 385E	Tectonics
GEOPHYS 385K	Crustal Mechanics
GEOPHYS 385L	Earthquake Seismology, Deformation, and Stress
GEOPHYS 385M	Experimental Rock Physics
GEOPHYS 385S	Wave Physics
GEOPHYS 385V	Poroelasticity
GEOPHYS 385W	GEOPHYSICAL MULTI-PHASE FLOWS
GEOPHYS 385Z	Radio Remote Sensing
GERMAN 285	Environmentalism, Literature and Cultural Criticism
GES 50Q	
GES 260	
GES 267	
GES 277	
GES 310	
GES 340	
GS 1	Introduction to Geology
GS 4	Coevolution of Earth and Life
GS 5	Living on the Edge
GS 8	Oceanography: An Introduction to the Marine Environment
GS 12SC	Environmental and Geological Field Studies in the Rocky Mountains
GS 14	Our National Parks
GS 38N	The Worst Journey in the World: The Science, Literature, and History of Polar Exploration
GS 40N	Diamonds
GS 46Q	Environmental Impact of Energy Systems: What are the Risks?
GS 55Q	The California Gold Rush: Geologic Background and Environmental Impact
GS 59N	Earthquake 9.0: The Heritage of Fukushima Daiichi 6 Years Later
GS 90	Introduction to Geochemistry
GS 102	Earth Materials: Introduction to Mineralogy
GS 103	Earth Materials: Rocks in Thin Section
GS 104	Introduction to Petrology
GS 105	Introduction to Field Methods
GS 106	Sedimentary Geology and Depositional Systems
GS 107	Journey to the Center of the Earth
GS 110	Structural Geology and Tectonics
GS 111	Fundamentals of Structural Geology
GS 114A	Our National Parks
GS 115	Engineering Geology and Global Change
GS 118	D^3: Disasters, Decisions, Development
GS 121	What Makes a Habitable Planet?
GS 122	Planetary Systems: Dynamics and Origins
GS 123	Evolution of Marine Ecosystems
GS 128	Evolution of Terrestrial Ecosystems
GS 130	Soil Physics and Hydrology
GS 131	Hydrologically-Driven Landscape Evolution
GS 135	Sedimentary Geochemistry and Analysis
GS 150	Senior Seminar: Issues in Earth Sciences
GS 163	Introduction to Isotope Geochemistry
GS 170	Environmental Geochemistry
GS 171	Geochemical Thermodynamics
GS 180	Igneous Processes
GS 182	Field Trip to Cascade Volcanoes of California
GS 184	Field Trip to Volcanoes of the Eastern Sierran Volcanism
GS 185	Volcanology
GS 190	Research in the Field
GS 191	Stanford EARTH Field Courses
GS 192	Undergraduate Research in Geological Sciences
GS 197	Senior Thesis

GS 198	Special Problems in Geological Sciences
GS 204	Introduction to Petrology
GS 206	Topics in Organismal Paleobiology
GS 207	Journey to the Center of the Earth
GS 208	Topics in Geobiology
GS 209	Microstructures
GS 210	Geologic Evolution of the Western U.S. Cordillera
GS 211	Topics in Regional Geology and Tectonics
GS 212	Topics in Tectonic Geomorphology
GS 213	Topics in Sedimentary Geology
GS 214	Topics in Paleobiology
GS 218	D^3: Disasters, Decisions, Development
GS 221	What Makes a Habitable Planet?
GS 222	Planetary Systems: Dynamics and Origins
GS 223	Reflection Seismology Interpretation
GS 223B	Evolution of Marine Ecosystems
GS 226	At the intersection of geochemistry, sedimentary geology, and paleobiology
GS 228	Evolution of Terrestrial Ecosystems
GS 233A	Microbial Physiology
GS 234A	Molecular Microbial Biosignatures
GS 235	Sedimentary Geochemistry and Analysis
GS 238	Soil Physics
GS 240	Data science for geoscience
GS 246	Reservoir Characterization and Flow Modeling with Outcrop Data
GS 248	The Petroleum System: Investigative method to explore for conventional & unconventional hydrocarbons
GS 249	Petroleum Geochemistry in Environmental and Earth Science
GS 250	Sedimentation Mechanics
GS 251	Sedimentary Basins
GS 252	Sedimentary Petrography
GS 253	Petroleum Geology and Exploration
GS 254	Carbonate Sedimentology
GS 255	Basin and Petroleum System Modeling
GS 256	Quantitative Methods in Basin and Petroleum System Modeling
GS 257	Clastic Sequence Stratigraphy
GS 258	Introduction to Depositional Systems
GS 259	Stratigraphic Architecture
GS 261	Physics and Chemistry of Minerals and Mineral Surfaces
GS 262	Thermodynamics and Disorder in Minerals and Melts
GS 263	Introduction to Isotope Geochemistry
GS 266	Managing Nuclear Waste: Technical, Political and Organizational Challenges
GS 270	Environmental Geochemistry
GS 276	Earth's Weathering Engine
GS 280	Igneous Processes
GS 281	Principles of 40Ar/39Ar Thermochronometry
GS 282	Interpretative Methods in Detrital Geochronology
GS 283	Thermochronology and Crustal Evolution
GS 284	Field Seminar on Eastern Sierran Volcanism
GS 285	Igneous Petrogenesis of the Continents
GS 285A	Volcanology
GS 286	Secondary Ionization Mass Spectrometry
GS 287	Fundamentals of Mass Spectrometry
GS 290	Departmental Seminar in Geological Sciences
GS 291	GS Field Trips
GS 292	Directed Reading with Geological Sciences Faculty
GS 293A	Modern Carbonates Field Trip
GS 299	Field Research
GS 311	Interpretation of Tectonically Active Landscapes
GS 312	Analysis of Landforms
GS 313	Modeling of Landforms
GS 315	Literature of Structural Geology
GS 325	The Evolution of Body Size
GS 328	Seminar in Paleobiology
GS 336	Stanford Alpine Project Seminar
GS 373	METAMORPHIC PETROLOGY
GS 373L	Metamorphic Petrology Laboratory
GS 381	Igneous Petrology and Petrogenesis Seminar
GS 385	Practical Experience in the Geosciences
GS 399	Advanced Projects
GS 400	Graduate Research
GSBGEN 332	Sustainable Energy: Business Opportunities and Public Policy
GSBGEN 335	Clean Energy Project Development and Finance
GSBGEN 336	Energy Markets and Policy
GSBGEN 532	Clean Energy Opportunities
GSBGEN 533	Technology Licensing
GSBGEN 537	The Role of Business in Sustainable Food Systems
GSBGEN 538	Energy Policy, Markets, and Climate Change
GSBGEN 553	Intrapreneurship for Sustainability: Driving Environmental Change from Within Corporations
GSBGEN 585	Project You: Building and Extending your Personal Brand
HISTORY 1B	Global History: The Early Modern World, 1300 to 1800
HISTORY 40	World History of Science
HISTORY 40A	The Scientific Revolution
HISTORY 42S	The Circle of Life: Visions of Nature in Modern Science, Religion, Politics and Culture
HISTORY 44	Women and Gender in Science, Medicine and Engineering
HISTORY 47	History of South Africa
HISTORY 102	History of the International System
HISTORY 103D	Human Society and Environmental Change
HISTORY 106A	Global Human Geography: Asia and Africa
HISTORY 106B	Global Human Geography: Europe and Americas
HISTORY 140	World History of Science
HISTORY 147	History of South Africa
HISTORY 151	The American West
HISTORY 207B	Environment, Technology and Revolution in World History
HISTORY 208A	Science and Law in History
HISTORY 226E	Famine in the Modern World
HISTORY 243S	Human Origins: History, Evidence, and Controversy
HISTORY 254	Popular Culture and American Nature
HISTORY 278S	The Ethical Challenges of Climate Change
HISTORY 283	Middle East Oil and Global Economy
HISTORY 308A	Science and Law in History
HISTORY 309E	History Meets Geography

HISTORY 326E	Famine in the Modern World
HISTORY 342	Darwin in the History of Life
HISTORY 383	Middle East Oil and Global Economy
HISTORY 471A	Environmental History of Latin America
HISTORY 471B	Environmental History of Latin America
HISTORY 478	The Ethical Challenges of Climate Change
HRP 206	Meta-research: Appraising Research Findings, Bias, and Meta-analysis
HRP 214	Scientific Writing
HRP 216	Analytical and Practical Issues in the Conduct of Clinical and Epidemiologic Research
HRP 220	BIOTECHNOLOGY LAW AND POLICY
HRP 223	Introduction to Data Management and Analysis in SAS
HRP 225	Design and Conduct of Clinical and Epidemiologic Studies
HRP 226	Intermediate Epidemiologic and Clinical Research Methods
HRP 228	Genetic Epidemiology
HRP 230	Cancer Epidemiology
HRP 231	Epidemiology of Infectious Diseases
HRP 236	Epidemiology Research Seminar
HRP 238	Genes and Environment in Disease Causation: Implications for Medicine and Public Health
HRP 256	Economics of Health and Medical Care
HRP 259	Introduction to Probability and Statistics for Epidemiology
HRP 274	Design for Service Innovation
HRP 299	Directed Reading in Health Research and Policy
HUMBIO 2A	Genetics, Evolution, and Ecology
HUMBIO 2B	Culture, Evolution, and Society
HUMBIO 3B	Behavior, Health, and Development
HUMBIO 4B	Environmental and Health Policy Analysis
HUMBIO 5E	Science Education in Human Biology
HUMBIO 18SC	Conservation and Development Dilemmas in the Amazon
HUMBIO 19SC	Parks and Peoples: Dilemmas of Protected Area Conservation in East Africa
HUMBIO 112	Conservation Biology: A Latin American Perspective
HUMBIO 113	The Human-Plant Connection
HUMBIO 113S	Healthy/Sustainable Food Systems: Maximum Sustainability across Health, Economics, and Environment
HUMBIO 114	Environmental Change and Emerging Infectious Diseases
HUMBIO 118	Theory of Ecological and Environmental Anthropology
HUMBIO 121E	Ethnicity and Medicine
HUMBIO 122M	Challenges of Human Migration: Health and Health Care of Migrants and Autochthonous Populations
HUMBIO 125	Current Topics and Controversies in Women's Health
HUMBIO 126	Promoting Health Over the Life Course: Multidisciplinary Perspectives
HUMBIO 129	Critical Issues in International Women's Health
HUMBIO 130	Human Nutrition
HUMBIO 151R	Biology, Health and Big Data
HUMBIO 152	Viral Lifestyles
HUMBIO 153	Parasites and Pestilence: Infectious Public Health Challenges
HUMBIO 154A	Engineering Better Health Systems: modeling for public health
HUMBIO 155H	Humans and Viruses I
HUMBIO 159	Genes and Environment in Disease Causation: Implications for Medicine and Public Health
HUMBIO 166	Food and Society: Exploring Eating Behaviors in Social, Environmental, and Policy Context
HUMBIO 173	Science, Innovation and the Law
HUMBIO 178	Ethics and Politics of Public Service
HUMBIO 182	Peopling of the Globe: Changing Patterns of Land Use and Consumption Over the Last 50,000 Years
ILAC 263	Visions of the Andes
ILAC 271	Brazilian Presence: Landscape, Life and Literature
ILAC 363	Visions of the Andes
INTNLREL 61Q	Food and security
INTNLREL 102	History of the International System
INTNLREL 135A	International Environmental Law and Policy
INTNLREL 136F	Introduction to Global Justice
IPS 201	Managing Global Complexity
IPS 203	Issues in International Economics
IPS 270	The Geopolitics of Energy
LATINAM 207	Spanish in Science/Science in Spanish
MATSCI 156	Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution
MATSCI 256	Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution
MATSCI 302	Solar Cells
MATSCI 303	Principles, Materials and Devices of Batteries
ME 16N	Energy & The Industrial Revolution - Past, Present & Future
ME 23Q	The Worldly Engineer
ME 24N	Designing the Car of the Future
ME 25N	Energy Sustainability and Climate Change
ME 70	Introductory Fluids Engineering
ME 185	Electric Vehicle Design
ME 206A	Design for Extreme Affordability
ME 206B	Design for Extreme Affordability
ME 221	Green Design Strategies and Metrics
ME 222	Design for Sustainability
ME 226	Designing Sustainable Behavior
ME 250	Internal Combustion Engines
ME 257	Gas-Turbine Design Analysis
ME 260	Fuel Cell Science and Technology
ME 262	Physics of Wind Energy
ME 357	Gas-Turbine Design Analysis
ME 370A	Energy Systems I: Thermodynamics
ME 370B	Energy Systems II: Modeling and Advanced Concepts
ME 370C	Energy Systems III: Projects
ME 371	Combustion Fundamentals
ME 399	Fuel Cell Seminar
MED 108Q	Human Rights and Health
MED 274	Design for Service Innovation
MGTECON 651	Natural Resource and Energy Economics
MI 70Q	Photographing Nature
MLA 282	Indigenous Peoples and Environmental Problems

MS&E 52	Introduction to Decision Making
MS&E 92Q	International Environmental Policy
MS&E 93Q	Nuclear Weapons, Energy, Proliferation, and Terrorism
MS&E 152	Introduction to Decision Analysis
MS&E 181	Issues in Technology and Work
MS&E 185	Global Work
MS&E 190	Methods and Models for Policy and Strategy Analysis
MS&E 243	Energy and Environmental Policy Analysis
MS&E 250A	Engineering Risk Analysis
MS&E 250B	Project Course in Engineering Risk Analysis
MS&E 252	Decision Analysis I: Foundations of Decision Analysis
MS&E 292	Health Policy Modeling
MS&E 294	Climate Policy Analysis
MS&E 295	Energy Policy Analysis
MS&E 299	Voluntary Social Systems
MS&E 352	Decision Analysis II: Professional Decision Analysis
MS&E 494	The Energy Seminar
NATIVEAM 109	Federal Indian Law
NATIVEAM 109B	Indian Country Economic Development
OBGYN 256	Current Topics and Controversies in Women's Health
OIT 333	Design for Extreme Affordability
OIT 334	Design for Extreme Affordability
OIT 539	Environmental Science for Managers - Advanced
OIT 540	Environmental Science for Managers II
OSPAUSTL 10	Coral Reef Ecosystems
OSPAUSTL 25	Freshwater Systems
OSPAUSTL 30	Coastal Forest Ecosystems
OSPAUSTL 40	Australian Studies
OSPCPTWN 50	[Independent Study] Conservation & Resources in Sub-Saharan Africa
OSPCPTWN 63	Socio-Ecological Systems
OSPGEN 53	Corals of Palau: Ecology, the Physical Environment, and Reefs at Risk
OSPGEN 75	Evolution of Life in Neotropical Forests of Ecuador
OSPKYOTO 45	Japan's Energy-Environment Conundrum
OSPMADRD 8A	Cities and Creativity: Cultural and Architectural Interpretations of Madrid
OSPPARIS 86	Measuring Well-Being and Sustainability in Today's World
OSPSANTG 29	Sustainable Cities: Comparative Transportation Systems in Latin America
OSPSANTG 58	Living Chile: A Land of Extremes
OSPSANTG 71	Santiago: Urban Planning, Public Policy, and the Built Environment
OUTDOOR 101	Introduction to Outdoor Education
OUTDOOR 105	Outdoor Living Skills
OUTDOOR 106	Outdoor Leadership Practicum
PEDS 150	Social and Environmental Determinants of Health
PEDS 250	Social and Environmental Determinants of Health
PHIL 23M	Justice and Climate Change
PHIL 25SI	The Animal-Human Relationship: Interdisciplinary Perspectives
PHIL 64S	Introduction to Environmental Philosophy
PHIL 72	Contemporary Moral Problems
PHIL 73	The Ethics and Politics of Collective Action
PHIL 76	Introduction to Global Justice
PHIL 164	Central Topics in the Philosophy of Science: Theory and Evidence
PHIL 167B	Philosophy, Biology, and Behavior
PHIL 174A	Moral Limits of the Market
PHIL 175A	Ethics and Politics of Public Service
PHIL 177C	Ethics of Climate Change
PHIL 178M	Introduction to Environmental Ethics
PHIL 264	Central Topics in the Philosophy of Science: Theory and Evidence
PHIL 267B	Philosophy, Biology, and Behavior
PHIL 274A	Moral Limits of the Market
PHIL 275A	Ethics and Politics of Public Service
PHIL 277C	Ethics of Climate Change
PHIL 278M	Introduction to Environmental Ethics
PHYSICS 240	Introduction to the Physics of Energy
PHYSICS 241	Introduction to Nuclear Energy
POLECON 230	Strategy Beyond Markets
POLECON 231	Strategy Beyond Markets: Challenges and Opportunities in Developing Economies
POLISCI 12N	Climate Change and Conflict: Will Warming Lead to Warring?
POLISCI 18SC	The Federal Government and the West
POLISCI 19N	Politics of Energy Efficiency
POLISCI 73	Energy Policy in California
POLISCI 124A	The American West
POLISCI 131A	The Ethics and Politics of Collective Action
POLISCI 133	Ethics and Politics of Public Service
POLISCI 134L	Introduction to Environmental Ethics
POLISCI 136R	Introduction to Global Justice
POLISCI 241S	Spatial Approaches to Social Science
PSYCH 459	Frontiers in Interdisciplinary Biosciences
PUBLPOL 101	Politics and Public Policy
PUBLPOL 103D	Ethics and Politics of Public Service
PUBLPOL 104	Economic Policy Analysis
PUBLPOL 121	Policy and Climate Change
PUBLPOL 125	Law and Public Policy
PUBLPOL 194	Technology Policy
PUBLPOL 294	Technology Policy
PWR 1CS	Writing & Rhetoric 1: Debating the Environment
PWR 1KMB	Writing & Rhetoric 1: Cradle to Cradle: the Rhetoric of Sustainability
PWR 1MG	Writing & Rhetoric 1: The Rhetoric of the American West
PWR 1MS	Writing & Rhetoric 1: Seeing Nature: The Power of Environmental Visual Rhetoric
PWR 1SI	Writing & Rhetoric 1: Super-Storms, Polar Bears, and Droughts: The Rhetoric of Climate Change
PWR 1VS	Writing & Rhetoric 1: Eating-Animals: The Rhetoric of Animals, Food, and the Environment
PWR 2CR	Writing & Rhetoric 2: Communicating Science
PWR 2JS	Writing & Rhetoric 2: In Science We Trust
PWR 2KM	Writing & Rhetoric 2: A Planet on the Edge: The Rhetoric of Sustainable Energy
PWR 2RL	Writing & Rhetoric 2: The Rhetoric of the Natural and Beyond
PWR 2SB	Writing & Rhetoric 2: Writing 'Science': Fact, Fiction, and Everything Between

PWR 91CL	Intermediate Writing: Self & Science
PWR 91EP	Intermediate Writing: Communicating Climate Change: Navigating the Stories from the Frontlines
PWR 91JS	Intermediate Writing: Stanford Science Podcast
PWR 91KS	Intermediate Writing: Design Thinking and Science Communication
PWR 91NSC	Intermediate Writing: Introduction to Science Communication
PWR 91RS	Intermediate Writing: Communicating Bioinformation
PWR 91S	Intermediate Writing: Communicating Science
SIW 115	Health and Environmental Regulatory Policy
SIW 116	International Environmental Policy
SIW 122	Energy, Environment and Security in South Asia
SIW 128	Transitions in Energy Policy Speakers Series
SIW 132	Bridging the gap between environmental science and policy
SIW 137	Energy and Environment: Technology, Economics and Policy
SIW 140	Health and Environmental Policy Speaker Series
SIW 144	Energy, Environment, Climate and Conservation Policy: A Washington, D.C. Perspective
SIW 153	Energy and Climate Cooperation in the Western Hemisphere
SOC 118	Social Movements and Collective Action
SOC 159	Social and Cultural Dimensions of GlobalnIndigeneity
SOC 160	Formal Organizations
SOC 218	Social Movements and Collective Action
SOC 260	Formal Organizations
STATS 60	Introduction to Statistical Methods: Precalculus
STATS 110	Statistical Methods in Engineering and the Physical Sciences
STATS 141	Biostatistics
STATS 160	Introduction to Statistical Methods: Precalculus
STRAMGT 341	Achieving Social Impact
STS 131	Science, Technology, and Environmental Justice
STS 140	Science, Technology and Politics
STS 190	Issues in Technology and the Environment
STS 200A	Food and Society: Politics, Culture and Technology
STS 200E	Technology, Nature, and Environmentalism
SURG 231	Healthcare in Haiti and other Resource Poor Countries
THINK 8	Sustainability and Collapse
THINK 29	Networks: Ecological, Revolutionary, Digital
THINK 33	The Water Course
THINK 39	Energy? Understanding the Challenge, Developing Solutions
THINK 40	Sustainability Challenges and Transitions
URBANST 110	Utopia and Reality: Introduction to Urban Studies
URBANST 113	Introduction to Urban Design: Contemporary Urban Design in Theory and Practice
URBANST 114	Urban Culture in Global Perspective
URBANST 122	Ethics and Politics of Public Service
URBANST 124	Spatial Approaches to Social Science
URBANST 160	Environmental Policy and the City in U.S. History
URBANST 163	Land Use Control
URBANST 164	Sustainable Cities
URBANST 165	Sustainable Urban and Regional Transportation Planning
URBANST 167	Green Mobilities for the Suburbs of the Future
URBANST 174	Defining Smart Cities: Visions of Urbanism for the 21st Century
Total Units	0