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 interaction with natural changes in the Earth system. Earth Systems majors become skilled in those areas of science, economics, and policy needed to tackle the globe's most pressing 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 courses in the fundamentals of biology, 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. Tracks are designed to support focus and rigor but include flexibility for specialization. Examples of specialized focus 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 9-unit (270-hour) internship. The internship provides a hands-on academic experience working on a supervised field, laboratory, government, or private sector project.

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 workings of the physical and biological components of the Earth, as well as courses that describe the human activities that lead to change in the Earth system. Training in fundamentals includes introductory course work in geology, biology, chemistry, physics, and economics. Depending on the Earth Systems track chosen, training may also include introduction to the study of energy systems, microbiology, or soils.
2. *System Interactions:* Focus in these courses is on the fundamental interactions among the physical, biological, and human components of the Earth system. The dynamics of the interplay between natural variation and human-imposed influences must be understood to achieve effective solutions to environmental problems.
   a. Earth Systems courses that introduce students to the dynamic and multiple interactions that characterize global change problems include:

		Units
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 components of the environment's functions, undergraduate students focus their studies through one of six tracks: Anthrosphere, Biosphere, Energy Science & Technology, Oceans, Land Systems, or Sustainable Food & Agriculture.
4. *Skills Development:* Students take skills courses that help them to recognize, quantify, describe, and help solve complex problems that face society.

Field and laboratory methods can help students to recognize the scope and nature of environmental change. For example, 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.

Quantification of environmental problems requires training in single and multivariable calculus, linear algebra, and statistics. Training in statistics is specific to the area of focus: geostatistics, biostatistics, econometrics.

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. All Stanford students must complete one WIM course in their major. The Earth Systems WIM course is offered in Winter and Spring quarters:

		Units
EARTHSYS 200	Sustaining Action: Research, Analysis and Writing for the Public	3

Other Earth Systems courses also focus on effective written and oral communication and are recommended.

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	
or EARTHSYS 210C	Senior Capstone and Reflection	
EARTHSYS 210P	Earth Systems Capstone Project	1
EARTHSYS 260	Internship	9

A comprehensive list of environmental courses (p. 8) and advice on courses that focus on problem solving are available in the program office.

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

Learning Outcomes (Undergraduate)

The program expects majors to be able to demonstrate the following learning outcomes. These learning outcomes are used in 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.
2. analyze environmental problems at the interface of natural and human systems in an interdisciplinary fashion.
3. demonstrate the ability to communicate complex concepts and data to expert and non-expert audiences.

4. integrate and apply relevant science, economics, engineering, and policy to problem analysis and proposed solutions, both independently and as part of a team.

Learning Outcomes (Graduate)

The 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 carry out an internship project, participate in the Senior Capstone and Reflection (EARTHSYS 210A, EARTHSYS 210B, EARTHSYS 210C), 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 210B	Senior Capstone and Reflection	
EARTHSYS 210C	Senior Capstone and Reflection	
EARTHSYS 210P	Earth Systems Capstone Project	1
EARTHSYS 200	Sustaining Action: Research, Analysis and Writing for the Public	3
EARTHSYS 260	Internship	1-9

Required Foundation and Breadth Courses

		Units
Biology		4-10
Select one of the following:		
BIO 41	Genetics, Biochemistry, and Molecular Biology	
BIO 43	Plant Biology, Evolution, and Ecology	
BIOHOPK 43	Plant Biology, Evolution, and Ecology	
BIO 101	Ecology	
EARTHSYS 30	Ecology for Everyone	
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 1A	Introduction to Geology: The Physical Science of the Earth	
GS 1B	Introduction to Geology	
GS 1C	Introduction to Geology: Dynamic Earth	
GS 4	How to Build and Maintain a Habitable Planet: An Introduction to Earth System History	
EARTHSYS 117	Earth Sciences of the Hawaiian Islands	
Mathematics		5-15
Select one of the following:		
MATH 19 & MATH 20 & MATH 21	Calculus and Calculus and Calculus	
or MATH 41 & MATH 42	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 1A, 1B, 1C, or 4, or EARTHSYS 117. GS 1B, GS 1C, and EARTHSYS 117 are not offered in 15-16.

Tracks

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		
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 175	California Coast: Science, Policy, and Law	
ECON 51	Economic Analysis II	
ECON 102B	Applied Econometrics *	
ECON 150	Economic Policy Analysis	
ECON 154	Law and Economics	

INTNLREL 135A	International Environmental Law and Policy	
IPS 270	The Geopolitics of Energy	
LAW 603	Environmental Law and Policy	
MSE 197	Ethics, Technology, and Public Policy	
MSE 243	Energy and Environmental Policy Analysis	
MSE 294	Climate Policy Analysis	
MSE 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	
ME 206A	Entrepreneurial Design for Extreme Affordability	
ME 377	Design Thinking Studio: Experiences in Innovation and Design	
MSE 177	Creativity Rules	
MSE 180	Organizations: Theory and Management	
MSE 264	Sustainable Product Development and Manufacturing	
URBANST 132	Concepts and Analytic Skills for the Social Sector *	
URBANST 133	Social Entrepreneurship Collaboratory	
Sustainable Development		3-5
ANTHRO 161	Human Behavioral Ecology	
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)	
EARTHSYS 106	World Food Economy *	
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	
URBANST 163	Land Use Control	
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 above, these Bio courses are required:		5
BIO 41	Genetics, Biochemistry, and Molecular Biology	
And select one of the following:		5
BIO 43	Plant Biology, Evolution, and Ecology	
or BIOHOPK 43	Plant Biology, Evolution, and Ecology	
Additional Chemistry requirement (in addition to 31A/B or X):		5
CHEM 33	Structure and Reactivity	
Instead of Geology Foundation requirement listed above, select one of the following: [1]		4
GS 1C	Introduction to Geology: Dynamic Earth	
or GS 4	How to Build and Maintain a Habitable Planet: An Introduction to Earth System History	
or EARTHSYS 117	Earth Sciences of the Hawaiian Islands	
Physics (select one of the following):		4
PHYSICS 41	Mechanics	
or PHYSICS 45	Light and Heat	
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
BIO 216	Terrestrial Biogeochemistry	
CEE 177	Aquatic Chemistry and Biology	
CEE 274A	Environmental Microbiology I	
EARTHSYS 151	Biological Oceanography	
EARTHSYS 152	Marine Chemistry	
EARTHSYS 155	Science of Soils	
EARTHSYS 158	Geomicrobiology	
GS 130	Soil Physics and Hydrology	
Ecology and Conservation Biology		3-12
BIO 101	Ecology	
BIO 115	The hidden kingdom - evolution, ecology and diversity of fungi	
BIO 143	Evolution	
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	
GS 123	Paleobiology	
OSPAUSTL 10	Coral Reef Ecosystems	
OSPAUSTL 25	Freshwater Systems	
OSPAUSTL 30	Coastal Forest Ecosystems	
OSPSANTG 58	Living Chile: A Land of Extremes	
OSPSANTG 85	Marine Ecology of Chile and the South Pacific	
Ecosystems and Society [2]		3-5
ANTHRO 118	Heritage, Environment, and Sovereignty in Hawaii	
ANTHRO 147	Nature, Culture, Heritage	
ANTHRO 161	Human Behavioral Ecology	
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	
ANTHRO 183		
BIOHOPK 168H	Disease Ecology: from parasites evolution to the socio-economic impacts of pathogens on nations	
EARTHSYS 129	Geographic Impacts of Global Change: Mapping the Stories	
EARTHSYS 185	Feeding Nine Billion	
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 1C, GS 4, or EARTHSYS 117 to fulfill this requirement, and not GS 1A or 1B.

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

Energy, Science and Technology

		Units
Additional Foundation and Breadth Courses		8
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	Engineering Thermodynamics	
Select one of the following:		3-4
CEE 272R	Modern Power Systems Engineering	
ENERGY 120	Fundamentals of Petroleum Engineering	
MATSCI 154	Thermodynamic Evaluation of Green Energy Technologies	
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	Renewable Energy Sources and Greener Energy Processes	
EARTHSYS 103	Understanding Energy	
Choose at least one course in each of the three sub-categories, total five required. Please 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 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	Green House Gas Mitigation	
EARTHSYS 102	Renewable Energy Sources and Greener Energy Processes	
EARTHSYS 146	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation	
ENERGY 153	Carbon Capture and Sequestration	
MATSCI 154	Thermodynamic Evaluation of Green Energy Technologies	
MATSCI 156	Solar Cells, Fuel Cells, and Batteries: Materials for the Energy Solution	
Energy Policy, Economics & Entrepreneurship		2-4
ENERGY 104	Sustainable Energy for 9 Billion	
ENERGY 171	Energy Infrastructure, Technology and Economics	
ENERGY 191	Optimization of Energy Systems	
GSBGEN 336	Energy Markets and Policy	
LAW 455	Energy Law	
MSE 243	Energy and Environmental Policy Analysis	
MSE 264	Sustainable Product Development and Manufacturing	
MSE 294	Climate Policy Analysis	
MSE 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	
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	
BIO 216	Terrestrial Biogeochemistry	
EARTHSYS 155	Science of Soils	
EARTHSYS 156	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	
GEOPHYS 190	Near-Surface Geophysics	
GS 130	Soil Physics and Hydrology	
Land Use		3-5
CEE 124	Sustainable Development Studio	
CEE 176A	Energy Efficient Buildings	
EARTHSYS 106	World Food Economy	
EARTHSYS 181	Urban Agriculture in the Developing World	
EARTHSYS 185	Feeding Nine Billion	
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	
HISTORY 401A	Spatial History: Concepts, Methods, Problems	
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
Additional foundation and breadth courses		4

PHYSICS 41	Mechanics	
or PHYSICS 45	Light and Heat	
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	
EARTHSYS 184	Climate and Agriculture	
GS 130	Soil Physics and Hydrology	
HUMBIO 113	The Human-Plant Connection	
HUMBIO 130	Human Nutrition	
Social Dimensions		3-5
Select one of the following:		
ANTHRO 169	The Ecology of Cuisine: Food, Nutrition, and the Evolution of the Human Diet	
EARTHSYS 181	Urban Agriculture in the Developing World	
EARTHSYS 187	FEED the Change: Redesigning Food Systems	
ECON 118	Development Economics	
HISTORY 203G	Mobile Food: A Global Food History	
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

		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 11B	Earth on the Edge: Introduction to Geophysics	
Physics of the Atmosphere and Climate		3
Select one of the following:		
CEE 63	Weather and Storms	
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	
EARTHSYS 146B	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation [1]	
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	
EARTHSYS 175	California Coast: Science, Policy, and Law	
Field Experience [2]		12-20
Select at least one of the following:		
EARTHSYS 323	Stanford at Sea	
One quarter abroad at the Stanford in Australia Program		
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 EARTHSYS 146B can be taken in addition to EARTHSYS 164 and would count as an elective.

2 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	9
Senior Capstone & Reflection and Capstone Project	4
Writing in the Major (WIM)	3

Track-Specific:

	Units
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 Track	37-63

Honors Program

The Earth Systems honors program provides students with an opportunity to pursue individual 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 and one additional faculty member, who is the second reader. 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. The thesis must be accepted and approved by both readers and the Director of Earth Systems, and a minimum overall GPA of 3.4 must be maintained.

Honors students are required to present their research 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.

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

To apply, complete and return the following to the Earth Systems office (Y2E2, 131, attn: Kristin Tewksbury):

- The Stanford coterminal application (https://stanford.box.com/CotermApplic)
- 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; the advisers for the coterminal M.A. are Kevin Arrigo and Thomas Hayden)
- A list of courses that fulfill degree requirements signed by the master's adviser and the Director of Earth Systems

1. Applications must be submitted no later than the quarter prior to the expected completion of the B.S. degree (check with program office for specific 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.
4. Students applying from an undergraduate major other than Earth Systems should review their undergraduate course list with Deana Fabbro-Johnston, Richard Nevle, Katie Phillips, 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.

Master of Science in Earth Systems

Degree Requirements

The master of science degree in Earth Systems allows increased 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 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 (select one of the following):		4-10
BIO 41	Genetics, Biochemistry, and Molecular Biology	
BIO 43	Plant Biology, Evolution, and Ecology	
BIOHOPK 43	Plant Biology, Evolution, and Ecology	
BIO 101	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		
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	

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 student 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. 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 requirement.

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: 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), Karen Casciotti (Earth System Science), Page Chamberlain (Earth System Science), Larry Crowder (Biology, Woods Institute for the Environment), 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), 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), Ashley Erickson Reineman (Center for Ocean Solutions), 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 (Department of Global Ecology, Carnegie Institution, Woods Institute for the Environment), Derek Fong (Civil and Environmental Engineering), 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), Deborah Gordon (Biology, Woods Institute for the Environment), Steven Gorelick (Earth System Science, Woods Institute for the Environment), Elizabeth Hadly (Biology, Woods Institute for the Environment), Thomas Hayden (Earth Systems), George Hilley (Geological Sciences), Robert Jackson (Earth System Science, Woods Institute for the Environment), David Kennedy (History, emeritus, Woods Institute for the Environment), Donald Kennedy (Biology, Freeman Spogli Institute for International Studies, emeritus, Woods Institute for the Environment), Julie Kennedy (Earth Systems, Earth System Science, Woods Institute for the Environment), Karl Knapp (Atmosphere and Energy Operations), Rosemary Knight (Geophysics, Woods Institute for the Environment), Jeffrey Koseff (Civil and Environmental Engineering, Woods Institute for the Environment), Anthony Kovscek (Energy Resources Engineering), Eric Lambin (Earth System Science, Woods Institute for the Environment), 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), 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 (Earth Systems), Stephen Palumbi (Biology, Hopkins Marine Station, Woods Institute for the Environment), Jonathan Payne (Geological Sciences), Kabir Peay (Biology), Kathleen Phillips (Earth Systems), Bala Rajaratnam (Earth System Science, Statistics), Thomas Robinson (Medicine), Terry Root (Biology, Woods Institute for the Environment), Matt Rothe (Earth Systems, Hasso Plattner Institute of Design, Graduate School of Business), Paul Segall (Geophysics), Deborah Sivas (Law), George Somero (Biology, Hopkins Marine Station), 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	4
OSPSANTG 58	Living Chile: A Land of Extremes	5
OSPSANTG 85	Marine Ecology of Chile and the South Pacific	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 16N	African Americans and Social Movements	
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 190	Madagascar Prefield Seminar	
AFRICAST 200	The HIV/AIDS Epidemic in Tanzania: A Pre-Field Seminar	
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 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 161	Human Behavioral Ecology	
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 173	Human Dimensions of Global Environmental Change: Resilence, Vulnerability, and Environmental Justice	

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 261	Human Behavioral Ecology
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,Japanese Society and Culture
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 79N	Energy Options for the 21st Century
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 102B	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
ARCHLGY 270	Heritage Ecologies: Heritage, Culture, and the Environment
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 1	Human Evolution and Environment
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 10AX	Conservation Photography
BIO 10SC	Natural History, Marine Biology, and Research
BIO 12N	Sensory Ecology of Marine Animals
BIO 15N	Environmental Literacy
BIO 18Q	Plant Evolutionary Ecology
BIO 21	The Science of the Extreme Life of the Sea
BIO 29N	PARTY WITH TREES
BIO 30	Ecology for Everyone
BIO 30N	Extinctions in Near Time: Biodiversity loss since the Pleistocene
BIO 33N	Conservation Science and Practice
BIO 34N	Hunger
BIO 43	Plant Biology, Evolution, and Ecology
BIO 44Y	Core Plant Biology & Eco Evo Laboratory
BIO 101	Ecology
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 121	Biogeography
BIO 128	Geographic Impacts of Global Change: Mapping the Stories
BIO 136	Evolutionary Paleobiology
BIO 137	Plant Genetics
BIO 138	Ecosystem Services: Frontiers in the Science of Valuing Nature
BIO 141	Biostatistics
BIO 143	Evolution
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 186	Natural History of the Vertebrates
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 216	Terrestrial Biogeochemistry
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 326	Foundations in Biogeography
BIO 355	Ecology and Conservation of the Brazilian Cerrado: a neglected Latin American Ecosystem
BIO 356	Ecology & Conservation beyond Amazon and the Andes: The Rupestrian Grasslands of Tropical Mountains
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 44Y	Core Laboratory in Plant Biology, Ecology and Evolution
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 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 48N	Managing Complex, Global Projects
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	Foundations of Water Science and Engineering
CEE 100	Managing Sustainable Building Projects
CEE 101B	Mechanics of Fluids
CEE 101D	Computations in Civil and Environmental Engineering
CEE 107A	Understanding Energy
CEE 107F	Understanding Energy -- Field Trips
CEE 107S	Energy Resources: Fuels and Tools

CEE 107W	Understanding Energy -- Workshop
CEE 109	Creating a Green Student Workforce to Help Implement Stanford's Sustainability Vision
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 161A	Rivers, Streams, and Canals
CEE 163E	International Climate Negotiations: Unpacking the Road to Paris
CEE 163F	Groundwork for COP21
CEE 164	Introduction to Physical Oceanography
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 172S	Green House Gas Mitigation
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 179X	Sustainable Urban System Seminar
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 207F	Understanding Energy -- Field Trips
CEE 207S	Energy Resources: Fuels and Tools
CEE 207W	Understanding Energy -- Workshop
CEE 213	Patterns of Sustainability
CEE 217	Renewable Energy Infrastructure
CEE 223	Materials for Sustainable Urban Systems
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 260B	Surface and Near-Surface Hydrologic Response
CEE 260C	Contaminant Hydrogeology and Reactive Transport
CEE 261	Physics of Wind Energy
CEE 262A	Hydrodynamics
CEE 262B	Transport and Mixing in Surface Water Flows
CEE 262C	Modeling Environmental Flows
CEE 262D	Introduction to Physical Oceanography
CEE 262E	Lakes and Reservoirs
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 263E	International Climate Negotiations: Unpacking the Road to Paris
CEE 263F	Groundwork for COP21
CEE 263S	Atmosphere/Energy Seminar
CEE 264	Sediment Transport Modeling
CEE 264A	Rivers, Streams, and Canals
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 266D	Water Resources and Water Hazards Field Trips
CEE 268	Groundwater Flow
CEE 269A	Environmental Fluid Mechanics and Hydrology Seminar
CEE 269B	Environmental Fluid Mechanics and Hydrology Seminar
CEE 269C	Environmental Fluid Mechanics and Hydrology

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 272S	Green House Gas Mitigation
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 277C	Environmental Governance
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 279	Environmental Engineering Seminar
CEE 279S	Seminar: Issues in Environmental Science, Technology and Sustainability
CEE 279W	Innovation in Water Sector
CEE 279X	Sustainable Urban System Seminar
CEE 287	Earthquake Resistant Design and Construction
CEE 288	Introduction to Performance Based Earthquake Engineering
CEE 293	Foundations and Earth Structures
CEE 297R	Structural Geology and Rock Mechanics
CEE 301	The Energy Seminar
CEE 316	Sustainable Built Environment Research
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
CHPR 213	Healthy/Sustainable Food Systems: Maximum Sustainability across Health, Economics, and Environment
CHPR 266	Food and Society: Exploring Eating Behaviors in Social, Environmental, and Policy Context
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
COMPLIT 168	Imagining the Oceans

COMPLIT 363	Ecology, History, Exchange
COMPLIT 368A	Imagining the Oceans
COMPMED 84Q	Globally Emerging Zoonotic Diseases
CS 325	Topics in Computational Sustainability
CSRE 16N	African Americans and Social Movements
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 2	CLIMATE AND SOCIETY
EARTH 5	Geokids: Earth Sciences Education
EARTH 100	Research Preparation for Undergraduates
EARTH 117	Earth Sciences of the Hawaiian Islands
EARTH 191	GS Field Trips
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	How to Build and Maintain a Habitable Planet: An Introduction to Earth System History
EARTHSYS 9	Public Service Internship Preparation
EARTHSYS 10	Introduction to Earth Systems
EARTHSYS 12S	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 30	Ecology for Everyone
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 46C	Environmental Impact of Energy Systems: What are the Risks?
EARTHSYS 49N	Multi-Disciplinary Perspectives on a Large Urban Estuary: San Francisco Bay
EARTHSYS 56C	Changes in the Coastal Ocean: The View From Monterey and San Francisco Bays
EARTHSYS 57Q	Climate Change from the Past to the Future
EARTHSYS 61C	Food and security
EARTHSYS 100	Environmental and Geological Field Studies in the Rocky Mountains
EARTHSYS 101	Energy and the Environment
EARTHSYS 102	Renewable Energy Sources and Greener Energy Processes
EARTHSYS 103	Understanding Energy
EARTHSYS 104	The Water Course
EARTHSYS 105	Food and Community: New Visions for a Sustainable Future
EARTHSYS 105E	Ecology and Natural History of Jasper Ridge Biological Preserve
EARTHSYS 105	Ecology and Natural History of Jasper Ridge Biological Preserve
EARTHSYS 106	World Food Economy
EARTHSYS 107	Control of Nature
EARTHSYS 109	Creating a Green Student Workforce to Help Implement Stanford's Sustainability Vision
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 115	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	Paleobiology
EARTHSYS 127	GIS for good: Applications of GIS for International Development and Humanitarian Assistance
EARTHSYS 128	Evolutionary History of Terrestrial Ecosystems
EARTHSYS 129	Geographic Impacts of Global Change: Mapping the Stories
EARTHSYS 135	Podcasting the Anthropocene
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 151	Biological Oceanography
EARTHSYS 152	Marine Chemistry
EARTHSYS 155	Science of Soils
EARTHSYS 156	Soil and Water Chemistry
EARTHSYS 156	Marine Resource Economics and Conservation
EARTHSYS 158	Geomicrobiology
EARTHSYS 160	Sustainable Cities
EARTHSYS 163E	International Climate Negotiations: Unpacking the Road to Paris
EARTHSYS 163	Groundwork for COP21
EARTHSYS 164	Introduction to Physical Oceanography
EARTHSYS 168	The Evolving Sphere of Food Security
EARTHSYS 170	Environmental Geochemistry

EARTHSYS 172	Australian Ecosystems: Human Dimensions and Environmental Dynamics
EARTHSYS 173	Aquaculture and the Environment: Science, History, and Policy
EARTHSYS 175	California Coast: Science, Policy, and Law
EARTHSYS 176	Open Space Management Practicum
EARTHSYS 176	Open Space Practicum Independent Study
EARTHSYS 177	Interdisciplinary Research Survival Skills
EARTHSYS 177	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 183	Food Matters: Agriculture in Film
EARTHSYS 185	Feeding Nine Billion
EARTHSYS 187	FEED the Change: Redesigning Food Systems
EARTHSYS 188	Social and Environmental Tradeoffs in Climate Decision-Making
EARTHSYS 191	Introduction to Environmental Communication
EARTHSYS 195	Natural Hazards and Risk Communication
EARTHSYS 197	Directed Individual Study in Earth Systems
EARTHSYS 199	Honors Program in Earth Systems
EARTHSYS 200	Sustaining Action: Research, Analysis and Writing for the Public
EARTHSYS 205	Navigating Wicked Marine Problems
EARTHSYS 206	World Food Economy
EARTHSYS 207	Spanish in Science/Science in Spanish
EARTHSYS 210	Senior Capstone and Reflection
EARTHSYS 210	Senior Capstone and Reflection
EARTHSYS 210	Senior Capstone and Reflection
EARTHSYS 210	Earth Systems Capstone Project
EARTHSYS 211	Fundamentals of Modeling
EARTHSYS 219	Will Work for Food
EARTHSYS 235	Podcasting the Anthropocene
EARTHSYS 238	Land Use
EARTHSYS 241	Remote Sensing of the Oceans
EARTHSYS 242	Remote Sensing of Land
EARTHSYS 246	Atmosphere, Ocean, and Climate Dynamics: The Atmospheric Circulation
EARTHSYS 246	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation
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	International Climate Negotiations: Unpacking the Road to Paris
EARTHSYS 263	Groundwork for COP21
EARTHSYS 268	The Evolving Sphere of Food Security
EARTHSYS 272	Antarctic Marine Geology
EARTHSYS 273	Aquaculture and the Environment: Science, History, and Policy
EARTHSYS 275	California Coast: Science, Policy, and Law
EARTHSYS 276	Open Space Management Practicum
EARTHSYS 277	Interdisciplinary Research Survival Skills
EARTHSYS 277	Specialized Writing and Reporting: Environmental Journalism
EARTHSYS 281	Urban Agriculture in the Developing World
EARTHSYS 283	Food Matters: Agriculture in Film
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	Introduction to 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 156	Marine Resource Economics and Conservation
ECON 158	Regulatory Economics
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: Connecting People to Nature
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 237	Solar Energy Conversion
EE 255	Green Electronics
EE 292H	Engineering, Entrepreneurship & Climate Change
EE 292K	Intelligent Energy Projects
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
EESS 323	
ENERGY 24	Making Molehills out of Mountains: Energy and Development in Appalachia
ENERGY 101	Energy and the Environment
ENERGY 101A	Energizing California
ENERGY 102	Renewable Energy Sources and Greener Energy Processes
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 123	When Technology Meets Reality; An In-depth Look at the Deepwater Horizon Blowout and Oil Spill
ENERGY 125	Modeling and Simulation for Geoscientists and Engineers
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 212	Advanced Programming for Scientists and Engineers
ENERGY 221	Fundamentals of Multiphase Flow
ENERGY 223	Reservoir Simulation
ENERGY 227	Enhanced Oil Recovery
ENERGY 240	Geostatistics
ENERGY 241	Seismic Reservoir Characterization
ENERGY 246	Reservoir Characterization and Flow Modeling with Outcrop Data
ENERGY 253	Carbon Capture and Sequestration
ENERGY 256	Electronic Structure Theory and Applications to Chemical Kinetics
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 275	Quantitative Methods in Basin and Petroleum System Modeling
ENERGY 280	Oil and Gas Production Engineering
ENERGY 291	Optimization of Energy Systems
ENERGY 293B	Fundamentals of Energy Processes
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
ENGLISH 168	Imagining the Oceans
ENGLISH 368A	Imagining the Oceans
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 201	The Energy Transformation Collaborative
ENVRES 220	The Social Ocean: Ocean Conservation, Management, and Policy
ENVRES 230	Field Survey Data Collection & Analysis
ENVRES 238	Commercial Agriculture Seminar
ENVRES 240	Environmental Decision-Making and Risk Perception
ENVRES 250	Environmental Governance
ENVRES 270	Graduate Practicum in Environment and Resources
ENVRES 275	The Practice of Mining and Its Social and Environmental Context
ENVRES 280	Introduction to Environmental Science

ENVRES 290	Capstone Project Seminar in Environment and Resources
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 109	Creating a Green Student Workforce to Help Implement Stanford's Sustainability Vision
ENVRINST 177	Interdisciplinary Research Survival Skills
ENVRINST 198	Prehonors Seminar
ENVRINST 199	Interschool Honors Program in Environmental Science, Technology, and Policy
ENVRINST 260	Water in the West: Challenges and Opportunities
ENVRINST 277	Interdisciplinary Research Survival Skills
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 105	Food and Community: New Visions for a Sustainable Future
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, Developmen
ESS 122	GIS for good: Applications of GIS for International Development and Humanitarian Assistance
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 156	Soil and Water Chemistry
ESS 158	Geomicrobiology
ESS 162	Remote Sensing of Land
ESS 164	Fundamentals of Geographic Information Science (GIS)
ESS 173	Aquaculture and the Environment: Science, History, and Policy
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 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, Developmen
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 222	GIS for good: Applications of GIS for International Development and Humanitarian Assistance
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 270	Analyzing land use in a globalized world
ESS 273	Aquaculture and the Environment: Science, History, and Policy
ESS 280B	Principles and Practices of Sustainable Agriculture
ESS 281	Urban Agriculture in the Developing World
ESS 282	Ecological Farm Management
ESS 283	Food Matters: Agriculture in Film
ESS 292	Directed Individual Study in Environmental 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 330	Advanced Topics in Hydrogeology
ESS 342	Geostatistics
ESS 342B	Geostatistics
ESS 342C	Geostatistics
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 11Q	Sustainability And Social Justice
ETHICSOC 133	Ethics and Politics of Public Service
ETHICSOC 136I	Introduction to Global Justice
ETHICSOC 174A	Moral Limits of the Market
ETHICSOC 178I	Introduction to Environmental Ethics
ETHICSOC 180M	Collective Action Problems: Ethics, Politics, & Culture
ETHICSOC 185I	Contemporary Moral Problems
ETHICSOC 278M	Introduction to Environmental Ethics
FEMGEN 129	Critical Issues in International Women's Health
FRENCH 168	Imagining the Oceans
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	Earth on the Edge: Introduction to Geophysics
GEOPHYS 112	Exploring Geosciences with MATLAB
GEOPHYS 118	D^3: Disasters, Decisions, Developmen
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 146B	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation
GEOPHYS 150	Geodynamics: Our Dynamic Earth
GEOPHYS 160	D^3: Disasters, Decisions, Development
GEOPHYS 162	Laboratory Methods in Geophysics
GEOPHYS 170	Global Tectonics
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 199	Senior Seminar: Issues in Earth Sciences
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 204	Spectral Finite Element Method (SPECFEM) Seismograms
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, Developmen
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 246E	Atmosphere, Ocean, and Climate Dynamics: the Ocean Circulation
GEOPHYS 251	Structural Geology and Rock Mechanics
GEOPHYS 255	Report on Energy Industry Training
GEOPHYS 257	Introduction to Computational Earth Sciences
GEOPHYS 258	Applied Optimization Laboratory (Geophys 258)
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 286	Global Seismology
GEOPHYS 287	Earthquake Seismology
GEOPHYS 288A	Crustal Deformation
GEOPHYS 288B	Crustal Deformation
GEOPHYS 289	Global Positioning System in Earth Sciences
GEOPHYS 290	Tectonophysics
GEOPHYS 292	Magnetotellurics: Introduction, practical data analysis and inversion
GEOPHYS 385A	Reflection Seismology
GEOPHYS 385E	Environmental Geophysics
GEOPHYS 385D	Theoretical Geophysics

GEOPHYS 385E	Tectonics
GEOPHYS 385J	Global Seismic Techniques, Theory, and Application
GEOPHYS 385K	Crustal Mechanics
GEOPHYS 385L	Earthquake Seismology, Deformation, and Stress
GEOPHYS 385N	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 1A	Introduction to Geology: The Physical Science of the Earth
GS 1B	Introduction to Geology
GS 1C	Introduction to Geology: Dynamic Earth
GS 4	How to Build and Maintain a Habitable Planet: An Introduction to Earth System History
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 38N	The Worst Journey in the World: The Science, Literature, and History of Polar Exploration
GS 40N	Diamonds
GS 42N	Landscapes and Tectonics of the San Francisco Bay Area
GS 43Q	Environmental Problems
GS 46Q	Environmental Impact of Energy Systems: What are the Risks?
GS 55Q	The California Gold Rush: Geologic Background and Environmental Impact
GS 59N	The Legacy of Fukushima Daiichi
GS 90	Introduction to Geochemistry
GS 101	Environmental and Geological Field Studies in the Rocky Mountains
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 107	Journey to the Center of the Earth
GS 110	Structural Geology and Tectonics
GS 111	Fundamentals of Structural Geology
GS 115	Engineering Geology and Global Change
GS 118	D^3: Disasters, Decisions, Developmen
GS 121	What Makes a Habitable Planet?
GS 122	Planetary Systems: Dynamics and Origins
GS 123	Paleobiology
GS 128	Evolutionary History of Terrestrial Ecosystems
GS 130	Soil Physics and Hydrology
GS 131	Hydrologically-Driven Landscape Evolution
GS 135	Field and Analytical Methods in Historical Geobiology
GS 150	Senior Seminar: Issues in Earth Sciences
GS 151	Sedimentary Geology and Petrography: Depositional Systems
GS 163	Introduction to Isotope Geochemistry
GS 170	Environmental Geochemistry
GS 171	Geochemical Thermodynamics
GS 180	Igneous Processes
GS 184	Field Seminar on Eastern Sierran Volcanism
GS 185	Volcanology
GS 190	Research in the Field
GS 191	GS Field Trips
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 215	Structural Geology and Rock Mechanics
GS 218	D^3: Disasters, Decisions, Developmen
GS 222	Planetary Systems: Dynamics and Origins
GS 223	Reflection Seismology Interpretation
GS 223B	Paleobiology
GS 225	Contaminant Hydrogeology and Reactive Transport
GS 226	At the intersection of geochemistry, sedimentary geology, and paleobiology
GS 228	Evolutionary History of Terrestrial Ecosystems
GS 233A	Microbial Physiology
GS 234A	Molecular Microbial Biosignatures
GS 235	Field and Analytical Methods in Historical Geobiology
GS 237	Surface and Near-Surface Hydrologic Response
GS 238	Soil Physics
GS 240	Geostatistics
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 273	Isotope Geochemistry Seminar
GS 276	Earth's Weathering Engine
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 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 337	Business Collaboration to Promote a Sustainable Food System
GSBGEN 532	Cleantech: Business Fundamentals and Public Policy
GSBGEN 533	Sustainability as Market Strategy
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	Social Innovation through Corporate Social Responsibility
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 44Q	Gendered Innovations in Science, Medicine, Engineering, and Environment
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 144	Women and Gender in Science, Medicine and Engineering
HISTORY 147	History of South Africa
HISTORY 151	The American West
HISTORY 202B	Coffee, Sugar, and Chocolate: Commodities and Consumption in World History, 1200-1800
HISTORY 203G	Mobile Food: A Global Food History
HISTORY 203J	Water in World History
HISTORY 207B	Environment, Technology and Revolution in World History
HISTORY 226E	Famine in the Modern World
HISTORY 232F	The Scientific Revolution
HISTORY 243C	People, Plants, and Medicine: Atlantic World Amerindian, African, and European Science
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	The New Global Economy, Oil and Origins of the Arab Spring
HISTORY 302B	Coffee, Sugar, and Chocolate: Commodities and Consumption in World History, 1200-1800
HISTORY 303G	Mobile Food: A Global Food History
HISTORY 303J	Water in World History
HISTORY 309E	History Meets Geography
HISTORY 326E	Famine in the Modern World
HISTORY 332F	The Scientific Revolution
HISTORY 342	Darwin in the History of Life
HISTORY 343C	People, Plants, and Medicine: Atlantic World Amerindian, African, and European Science
HISTORY 383	The New Global Economy, Oil and Origins of the Arab Spring
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	Advanced 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 111	Human Dimensions of Global Environmental Change: Resilence, Vulnerability, and Environmental Justice
HUMBIO 111M	Marine Resource Economics and Conservation
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 117H	Human Behavioral Ecology
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	Disease control systems: epidemics, outbreaks, and 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
ILAC 263	Visions of the Andes
ILAC 264	Visions of the Andes
ILAC 271	Brazilian Presence: Landscape, Life and Literature
ILAC 363	Visions of the Andes
ILAC 364	Visions of the Andes
INTNLREL 61Q	Food and security
INTNLREL 102	History of the International System
INTNLREL 128E	International Problem-Solving Through NGOs: Policy, Players, Strategies, and Ethics
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
LAW 281	Natural Resources Law and Policy
LAW 338	Land Use
LAW 368	Law and Biosciences: Neuroscience
LAW 395	Creating New Legal Tools to Address the Environmental Impacts of Energy Projects
LAW 413O	Policy Practicum: China's Solar Industry and its Global Implications
LAW 413P	Policy Practicum: Wildlife Trafficking: Stopping the Scourge
LAW 413R	Policy Practicum: The National Environmental Policy Act: Pushing the Reset Button
LAW 413S	Policy Practicum: Carbon Pollution Standards and Carbon Taxes
LAW 413Y	Policy Practicum: Catalyzing Nature-Based Coastal Flood Mitigation and Adaptation
LAW 414A	Policy Practicum: Central Valley Habitat Exchange
LAW 414G	Policy Practicum: Energy and Environmental Governance
LAW 414Q	Policy Practicum: Developing a Federal Framework for Climate Change Policy
LAW 432	Managing Natural Resources In the Face of Climate Change and Other Stressors Workshop
LAW 437	Water Law and Policy
LAW 455	Energy Law
LAW 514	California Coast: Science, Policy and Law
LAW 515	Sustainable Energy: Business Opportunities and Public Policy
LAW 603	Environmental Law and Policy
LAW 605	International Environmental Law
LAW 622A	Environmental Law Clinic: Clinical Practice
LAW 622B	Environmental Law Clinic: Clinical Methods
LAW 622C	Environmental Law Clinic: Clinical Coursework
LAW 623	Advanced Environmental Law Clinic
LAW 681I	The Sea Around Us: Ethical, Physical, and Emotional Connections Between Humans and the Ocean
LAW 746	Climate Change Policy: Economic, Legal, and Political Analysis
LAW 768	Environmental Justice
LAW 774	Clean Energy Project Development and Finance
LAW 776	U.S. and International Issues in the Changing Arctic
MATSCI 154	Thermodynamic Evaluation of Green Energy Technologies
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	Entrepreneurial Design for Extreme Affordability
ME 206B	Entrepreneurial Design for Extreme Affordability
ME 214	Good Products, Bad Products
ME 221	Green Design Strategies and Metrics
ME 222	Design for Sustainability
ME 226	Designing Sustainable Behavior
ME 250	Internal Combustion Engines
ME 257	Turbine and Internal Combustion Engines
ME 260	Fuel Cell Science and Technology
ME 262	Physics of Wind Energy
ME 314	Good Products, Bad Products
ME 357	Turbine and Internal Combustion Engines
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
MI 155H	Humans and Viruses I
MLA 282	Indigenous Peoples and Environmental Problems
MSE 52	Introduction to Decision Making
MSE 92Q	International Environmental Policy
MSE 93Q	Nuclear Weapons, Energy, Proliferation, and Terrorism
MSE 152	Introduction to Decision Analysis
MSE 152W	Introduction to Decision Analysis
MSE 181	Issues in Technology and Work for a Postindustrial Economy
MSE 185	Global Work
MSE 190	Methods and Models for Policy and Strategy Analysis
MSE 197	Ethics, Technology, and Public Policy
MSE 243	Energy and Environmental Policy Analysis
MSE 250A	Engineering Risk Analysis
MSE 250B	Project Course in Engineering Risk Analysis
MSE 252	Decision Analysis I: Foundations of Decision Analysis
MSE 264	Sustainable Product Development and Manufacturing
MSE 292	Health Policy Modeling
MSE 294	Climate Policy Analysis
MSE 295	Energy Policy Analysis
MSE 299	Voluntary Social Systems
MSE 352	Decision Analysis II: Professional Decision Analysis
MSE 453	Decision Analysis Applications: Business Strategy and Public Policy
MSE 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
OSPBER 16	Technology and Policy for Sustainable Energy in Germany
OSPCPTWN 50	[Independent Study] Conservation & Resources in Sub-Saharan Africa
OSPCPTWN 63	Socio-Ecological Systems
OSPKYOTO 45	Japan's Energy-Environment Conundrum
OSPMADRD 8A	Architecture, Culture and Nature in Madrid: Towards a Sustainable City
OSPPARIS 10D	Climate Change Research Internship
OSPPARIS 10G	Oceanography Research Internship
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
OSPSANTG 85	Marine Ecology of Chile and the South Pacific
OUTDOOR 101	Introduction to Outdoor Education
OUTDOOR 105	Outdoor Living Skills
OUTDOOR 106	Outdoor Leadership Practicum
OUTDOOR 415	Adventure Experience Management
OUTDOOR 416	Outdoor Educator Apprenticeship
OUTDOOR 495	Outdoor Education: Assistant Instructor
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	Collective Action Problems: Ethics, Politics, & Culture
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	Collective Action Problems: Ethics, Politics, & Culture
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 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: Everyone Has a ¿Climate Thing¿: The Discourse 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 1KMB	Writing & Rhetoric 1: Cradle to Cradle: the Rhetoric of Sustainability
PWR 91CL	Intermediate Writing: Creative Inquiry: New Genres for Science Writing
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 91RS	Intermediate Writing: Communicating Bioinformation
PWR 91S	Intermediate Writing: Communicating Science
PWR 91NSC	Intermediate Writing: Introduction to Science Communication
RELIGST 106	Religion and the Environment: The Moral Meanings of Nature
SIW 115	Health and Environmental Regulatory Policy
SIW 116	International Environmental Policy
SIW 121	Economic Analysis of Federal Environmental and Health Regulations
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 16N	African Americans and Social Movements
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 & 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	Meeting the Global Sustainability Challenge
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