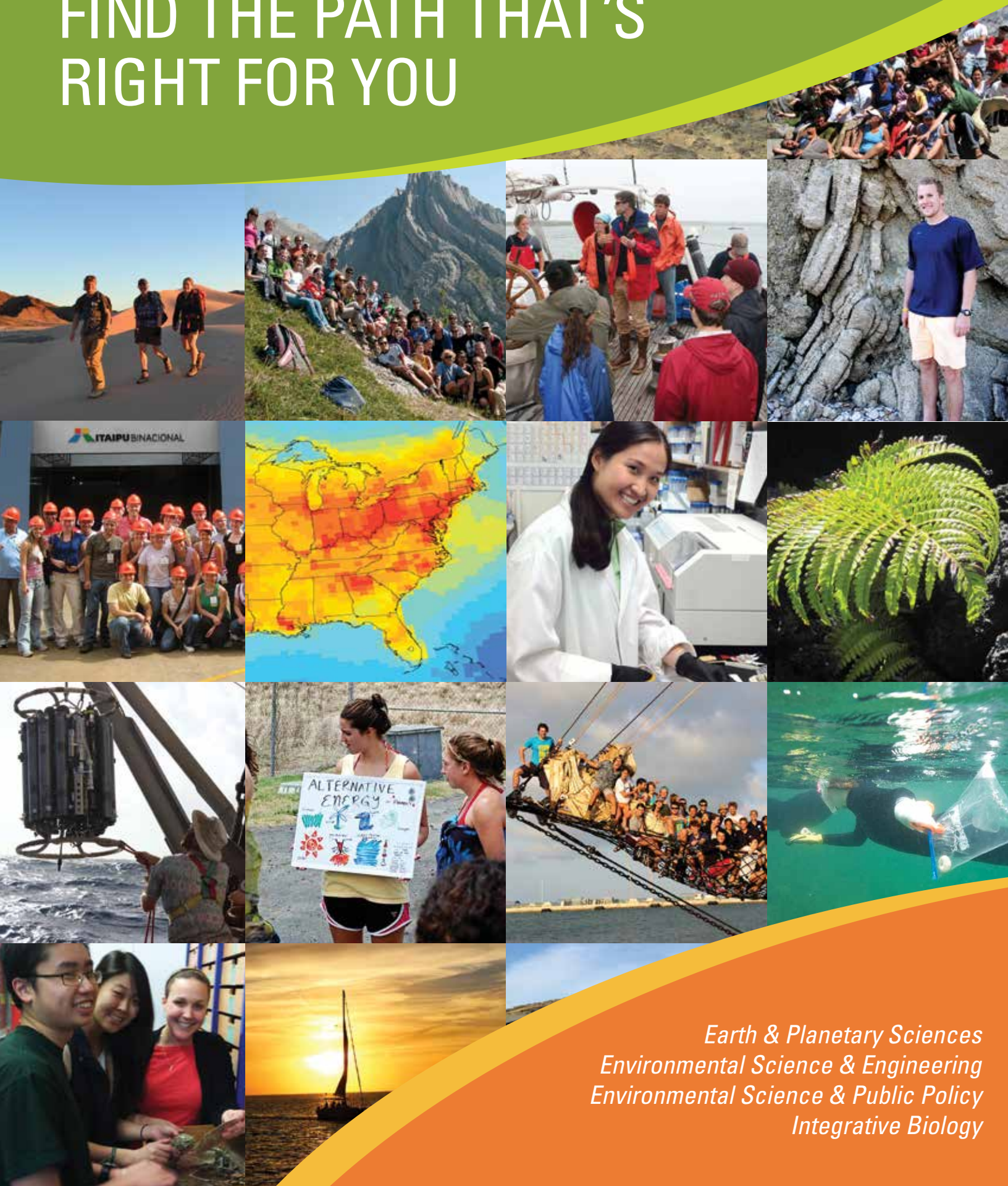
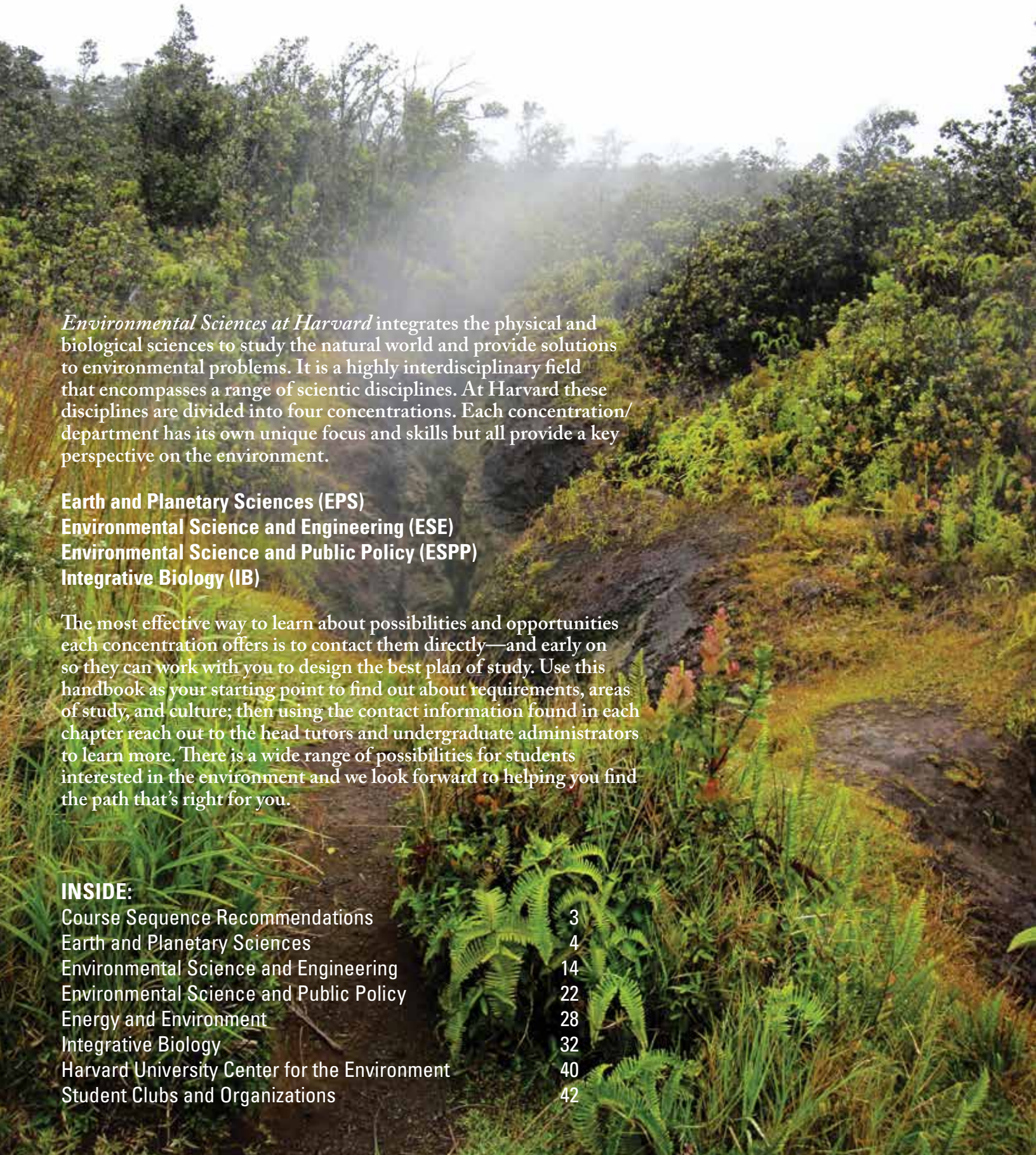
2017-2018 Undergraduate Education • Environmental Sciences at Harvard

FIND THE PATH THAT'S RIGHT FOR YOU



Earth & Planetary Sciences
Environmental Science & Engineering
Environmental Science & Public Policy
Integrative Biology

WELCOME TO
ENVIRONMENTAL SCIENCES AT HARVARD



Environmental Sciences at Harvard integrates the physical and biological sciences to study the natural world and provide solutions to environmental problems. It is a highly interdisciplinary field that encompasses a range of scientic disciplines. At Harvard these disciplines are divided into four concentrations. Each concentration/department has its own unique focus and skills but all provide a key perspective on the environment.

Earth and Planetary Sciences (EPS)
Environmental Science and Engineering (ESE)
Environmental Science and Public Policy (ESPP)
Integrative Biology (IB)

The most effective way to learn about possibilities and opportunities each concentration offers is to contact them directly—and early on so they can work with you to design the best plan of study. Use this handbook as your starting point to find out about requirements, areas of study, and culture; then using the contact information found in each chapter reach out to the head tutors and undergraduate administrators to learn more. There is a wide range of possibilities for students interested in the environment and we look forward to helping you find the path that's right for you.

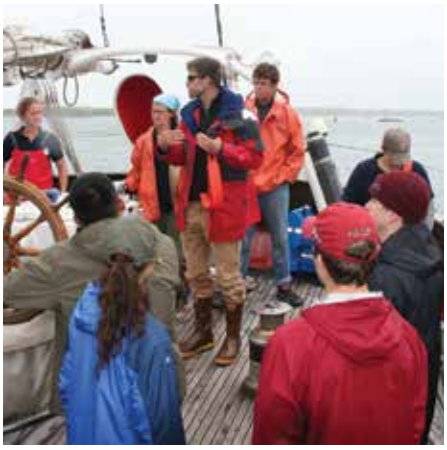
INSIDE:

COURSE SEQUENCE RECOMMENDATIONS

The chart below lists courses each environmental science concentration recommends students consider taking within their first three terms at Harvard. Every student's plan of study and trajectory is different so we encourage you to contact the departments directly for advice on course selection.

	Earth & Planetary Sciences	**Environmental Science & Engineering**	**Environmental Science & Public Policy**	**Integrative Biology**
Introductory Courses	EPS 10 *or* SPU 12, 14, 25, 29, 30 or 31 *or* any 50-level EPS course	ES 6	ESPP 11 *or* ES 6 *or* EPS 50 *or* SPU 25 *or* SPU 29 *or* SPU 31	LS 1A (or LPSA or LS 50A) LS 1B (or LS 50B) OEB 10
Chemistry	Physical Sciences 10 & 11 *or* Physical Sciences 1, 10, or 11 followed by EPS-ES 133, 135 or ES 164 *or* Chemistry 17 or higher *or* EPS-ES 133, 135 or ES 164	Physical Sciences 11 *and* Life Sciences 1a *or* Physical Sciences 10	Physical Sciences 1 *or* Physical Sciences 11 *or* EPS 135	Optional
Math	Math 21a,b *or* Applied Math 21a,b	Math 1a,b *and* Math 21a,b *or* Applied Math 21a,b	Minimum requirement is Math1a and 1b; More advanced courses in math and statistics can be chosen; *Begin according to placement.*	Optional
Physics	Physical Sciences 12a,b *or* Physics 15a,b,c *or* Applied Physics 50a,b	Physical Sciences 12a,b or Physics 15a,b *or* Physics 16, 15b *or* Applied Physics 50a,b	Optional	Optional

EARTH & PLANETARY SCIENCES



…we have an imperative to better understand the consequences of human activities for the Earth's atmosphere, the oceans, the solid Earth, and the organisms that live on it.

These are intellectually exciting times for the Earth and planetary sciences, which are of unprecedented importance to contemporary society. Our environment is increasingly subject to stresses placed upon it. As never before, we have an imperative to better understand the consequences of human activities for the Earth's atmosphere, the oceans, the solid Earth, and the organisms that live on it. Exploring for, extracting, and conserving natural resources are vital to the global political economy. We must mitigate the ill effects of earthquakes, landslides, volcanic eruptions, and climate change by learning to predict their time and place. Moreover, new technologies, datasets and computational capacity are allowing us to better understand the functioning of Earth systems and the interplay between tectonics, climate, and life.

WHY EARTH AND PLANETARY SCIENCES?

The field of Earth and Planetary Sciences (EPS) deals with questions that require a combination of scientific innovation, deep understanding, and an interdisciplinary approach involving all the core sciences. EPS's research environment is an unparalleled resource for undergraduate education. Concentrators may work with faculty and graduate students on major research projects as a research or field assistant, in the context of course work, or as part of an undergraduate research project. Class sizes are small and student-professor contact is frequent and informal. Students are encouraged to participate in department-sponsored field trips; experiences that build a tight-knit community among undergraduates, graduate students, and faculty. By the time they graduate, each EPS concentrator has become personally acquainted with numerous faculty members in the department, and many complete their studies with a senior thesis based on original research. Earth and Planetary Sciences provides a challenging and sophisticated environment with many career opportunities in the private sector, government, and academic research.

EPS OFFERS:

- A science that addresses important societal challenges
- A mid-size department, accessible and friendly
- High faculty to student ratio
- Individual faculty advisor for each EPS concentrator and secondary fielder
- Flexible course of study
- Training in the basic sciences leading to focused study in selected subfields
- World-wide summer field research camps and January field experiences
- Research/lab opportunities and summer internships with funding
- Opportunities to conduct original research with guidance from EPS faculty, resulting in a senior thesis

ACTIVITIES:

- Department-sponsored field trips: Canadian Rockies, Hawaii, and sailing off the coast of California or Massachusetts
- Weekend field trips to geological sites
- Seminars/tutorials/special presentations
- Opportunities for informal interaction with faculty and students
- Daily 3:00 pm cookies and tea, weekly Friday 5:00 pm pizza
- GeoSociety: a student-run organization whose activities complement the work in and out of the classroom.
  To learn more contact Hannah Byrne (hbyrne@college.harvard.edu) or Katie Polik (catherinepolik@college.harvard.edu).

WHY I CHOSE EPS

I came to Harvard expecting to study mechanical engineering and, after two fairly long years of pursuing that, decided to explore other options in the sciences. I stumbled upon EPS and switched concentrations, having never before taken a class in the department. Within a few weeks I had met several EPS professors, eaten more than my fair share of department-supplied cookies in Hoffman Lounge and had seen ample evidence of the warm community within the department. A year down the line, I can confidently say that choosing to join EPS is the best decision that I have made at Harvard and is one that has put me on a path that I am excited to explore further. I have worked with some of the most incredible people I have ever met, have discovered a real passion for Earth sciences and cannot imagine being in a more caring and tight-knit community than the one that exists here.

HANNAH BYRNE '18
EPS PRIMARY

I knew I loved science, but I could not choose between chemistry and physics. EPS was perfect for me because it combines all the sciences and applies them to problems that influence the entire world. (I get a kick out of being able to analyze data from the entire planet on my small laptop.) The EPS community is also spectacular; undergraduates, grad students, administrators and professors bond through small classes, community events, and field trips. Additionally, the EPS professors are geniuses with diverse research interests. They are well-connected with the worldwide Earth science community, which helps when you apply to internships or want advice. They are very approachable (everyone goes by their first name) and they care about undergrads' development as scientists. And you can choose a professor to be your academic advisor, which is unheard of in most other concentrations. EPS is truly the "hidden gem" of the Harvard concentrations.

MAYA CHUNG '19
EPS PRIMARY

I started at Harvard without knowing what I really wanted to do, and so, perhaps unsurprisingly, I had trouble picking what classes to take my freshman fall. In the end, I took an introductory EPS course and Professor Miaki Ishii's Freshman Seminar, GeoSciFi Movies: Real v. Fiction. Both classes fascinated me, and helped me realize how great the department is. I loved how learning about all the ways that we can read the Earth as if it were a book. In fact, I loved it so much that the very next semester, I ended up both working in Professor Ishii's lab and declaring EPS as my concentration. It has a great community feel about it, and that made events like the departmental field trip to Hawaii even more fun. I have found the department to be one of the friendliest places on campus, and now, I can't imagine my life without EPS!

THOMAS LEE '19
EPS PRIMARY

I chose EPS for a number of reasons. For one, the chance to do science in amazing places is something that deeply appealed to my sense of adventure, and in EPS I've found the opportunity to satisfy that with field work in a variety of far off locales. I was also interested by the multidisciplinary nature of Earth science, which combines biology, chemistry, and physics to build models of our great, complicated planet. The interplay of methods is always intellectually exciting. Finally, I settled on EPS because I knew it could provide me with a community. I've made wonderful friendships with undergrads, graduate students, and faculty and am inspired by the passion and fun-loving spirit of all in the department. Hoffman labs really does feel like home at the end of the day!

MATTHEW MILLER '18
EPS PRIMARY

I've always loved the mountains. My family used to vacation in the Rockies, and I would bring back a rock from each hike we went on. It only seemed natural for me to follow this passion when I came to college. As luck would have it, my first EPS trip was to the Canadian Rockies. Learning the geological history of the area had me hooked, but what really sealed the deal were the other undergraduates. There's a lot of time to talk while hiking, so I got to know everyone really quickly. Some people joined EPS because they loved rocks like me, others wanted to do research on climate change or the ocean, and some just really loved to be outside. EPS covers such a broad range of disciplines, and each person is just as passionate about their research area as you will become about yours. Being an EPS concentrator has allowed me to study what I love, travel the world, and do both of these things with some really cool people.

KATIE POLIK '18
EPS PRIMARY

The EPS department only has nice people. In every interaction, be it with fellow undergrads, graduate students, professors, or staff, you'll walk away amazed by how nice and happy they are. The resources the department invests in supporting community are mind-boggling and its help make EPS the best department at Harvard. An EPS degree is about as versatile as you can get too—you're able to tailor your studies to what interests you and you can work in just about any industry. I arrived at EPS at the end of my freshman year interested in mountains and rocks, and since then have developed a strong interest in ice and Earth's natural processes. There are still so many unknowns with regard to the Earth and studying the cutting edge discoveries of our professors in class and working on problems no one knows the answer to in the lab is a feeling you can probably only get in EPS.

VLAD SEVOSTIANOV '19
EPS PRIMARY

EARTH AND PLANETARY SCIENCES COURSE SEQUENCE

Because the Earth's natural systems (atmosphere, ocean, biosphere, solid earth) are interconnected, the training of Earth and planetary scientists broadly spans the boundaries between biology, chemistry, engineering, physics, mathematics, and the Earth sciences themselves, and provides a broad intellectual foundation that is beyond what is typically possible in a "pure" science program. The department trains students rigorously in the basic sciences, typically in the same foundational courses as students in Astrophysics, Chemistry, Engineering Sciences, and Physics. These foundational courses are followed by upper-level courses that focus on disciplines within Earth and planetary sciences. To facilitate and reinforce our interdisciplinary vision, students are required to take at least one course in each of the three major sub-disciplines in the department: Atmosphere(s) and Oceans; Geobiology and Earth History; and Geology, Geophysics and Planetary Science. The chart below lists courses EPS recommends students consider taking within their first three terms at Harvard. Each student's plan of study and trajectory is different so we encourage you to contact us directly for advice on course selection.

EPS/GEN-ED	EPS 10	**A Brief History of the Earth** *or*
	SPU 12	**Natural Disasters** *or*
	SPU 14	**How to Build a Habitable Planet** *or*
	SPU 25	**Energy and Climate: Vision for the Future** *or*
	SPU 29	**The Climate-Energy Challenge** *or*
	SPU 30	**Life as a Planetary Phenomenon** *or*
	SPU 31	**Energy Resources and the Environment** *or*
		NB: No more than one of these from EPS 10 or SPU 12, 14, 25, 29, 30 or 31. *All 50-level EPS courses can count as foundational courses.*
MATH	Math 21a	**Multivariable Calculus** *and*
	Math 21b	**Linear Algebra and Differential Equations** *or*
	Applied Math 21a	**Mathematical Methods in the Sciences** *and*
	Applied Math 21b	**Mathematical Methods in the Sciences**
CHEMISTRY	Physical Sciences 1	**Chemical Bonding, Energy, and Reactivity: An Introduction to the Physical Sciences** *and*
	Physical Sciences 10	**Quantum and Statistical Foundations of Chemistry** *and/or*
	Physical Sciences 11	**Foundations and Frontiers of Modern Chemistry: A Molecular and Global Perspective** *or*
	Chemistry 17	**Principles of Organic Chemistry** *or higher or*
	EPS-ES 133	**Atmospheric Chemistry** *or*
	EPS-ES 135	**Physics and Chemistry: Context of Energy and Climate** *or*
	ES 164	**Environmental Chemistry**
PHYSICS	*Preferred*	
	Physical Sciences 12a	**Mechanics from an Analytic, Numerical and Experimental Perspective** *and*
	Physical Sciences 12b	**Electromagnetism and Statistical Physics from an Analytic, Numerical and Experimental Perspective** *or*
	Physics 15a	**Introductory Mechanics and Relativity** *and*
	Physics 15b	**Introductory Electromagnetism and Statistical Physics** *and*
	Physics 15c	**Wave Phenomena**
	Applied Physics 50a	**Physics as a Foundation for Science and Engineering, Part I** *and*
	Applied Physics 50b	**Physics as a Foundation for Sciences and Engineering, Part II**
	By petition	
	Physical Sciences 2	**Mechanics, Elasticity, Fluids, and Diffusion** *and*
	Physical Sciences 3	**Electromagnetism, Circuits, Waves, Optics, and Imaging**

EARTH AND PLANETARY SCIENCES CONCENTRATION REQUIREMENTS
(14 COURSES + DEPARTMENT TUTORIAL)

A total of six EPS courses with at least one course at the 50- or 100-level sampling all three sub-disciplines: Atmosphere(s) and Oceans; Earth History and Geobiology; and Geology, Geophysics and Planetary Science.

1. EARTH & PLANETARY SCIENCES (2 courses)	EPS 10	*or*	SPU 12, 14, 25, 29, 30 *or* 31	*or*	any 50-level EPS course

No more than one of these from EPS 10 or SPU 12, 14, 25, 29, 30 or 31.

2. MATHEMATICS (2 courses)	Math 21a & 21b		*or*	Applied Math 21a & 21b	
3. CHEMISTRY (1-2 courses)	Phy Sci 10 & 11	*or*	Phy Sci 1, 10, or 11 followed by EPS-ES 133, EPS-ES 135 or ES 164	*or*	Chem 17 or higher or EPS-ES 133 or EPS-ES 135 or ES 164
4. PHYSICS (2-3 courses)	Physics 12a & 12b or Physics 15a, 15b &15c	*or*	Applied Physics 50a & 50b	*or*	Physical Sciences 2 & 3 *by petition*
5. UPPER LEVEL EPS COURSES (4 courses)	Four additional courses in EPS, three of which must be numbered 99 or above.				
6. FURTHER HALF-COURSES (1-3 courses)	Additional courses in EPS or related fields may be required to complete the requirement of at least 14 courses. Related fields include applied math, astrophysics, biology, chemistry, computer sciences, engineering sciences, ESPP, mathematics, physics, and statistics which count toward the respective concentration requirements.				
7. TUTORIAL (Minimum 5 sessions)	Schedule for 2017-2018 October 4 November 1 December 6 February 7 March 7 April 4				
8. HONORS ELIGIBILITY	EPS 99r Senior Thesis Tutorial				

See student handbook to learn about subdisciplines in Atmospheric and Ocean Science, Energy and Climate, Environmental Geoscience, Geobiology, Geochemistry, Geology, Planetary Sciences, and Solid Earth Geophysics.

EARTH AND PLANETARY SCIENCES SECONDARY REQUIREMENTS
(5 COURSES + DEPARTMENT TUTORIAL)

The EPS secondary field is intended to provide a strong foundation in one or more subfields of Earth science (Atmospheric and Ocean Science, Energy and Climate, Environmental Geoscience, Geobiology, Geochemistry, Geology, Planetary Sciences, and Solid Earth Geophysics) to students who have sufficient preparation in physics, chemistry, and mathematics. Secondary field students are required to take the departmental tutorial, an ongoing series of lectures by faculty scheduled periodically through the academic year.

2 FOUNDATIONAL COURSES

A minimum of 2 foundational courses from either EPS 10 or SPU 12, 14, 25, 29, 30, and 31, and all 50-level EPS courses.
NB: No more than one of these from EPS 10 or SPU 12, 14, 25, 29, 30 or 31.

COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:

3 ADDITIONAL COURSES IN EPS

COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:

DEPARTMENT TUTORIAL *Non-credit.*

Generally taken in the first year of declaring. Need to attend five EPS tutorials. Non-credit.
Schedule for 2017-2018:

- [ ] OCTOBER 4
- [ ] NOVEMBER 1
- [ ] DECEMBER 6
- [ ] FEBRUARY 7
- [ ] MARCH 7
- [ ] APRIL 4

MEDICAL DOCTOR
DANNY KIM '10
5TH YEAR MD/MPH STUDENT, UCSF SCHOOL OF MEDICINE, PRIME-US

I chose to study EPS for a couple reasons: content and community. One, as a pre-med, I liked that my EPS courses covered requirements for applying to medical school, but I could expand my horizons with interesting chemistry courses that engaged with the Earth and our environment. Two, the sense of community within EPS is quite special. The annual field trips and frequent pizza parties are so fun and helped build a lot of friendships. It makes a huge difference when you can take classes (and still meet medical school course requirements) with friends who seek to grasp and enjoy the material—as opposed to more traditional "pre-med" science courses where some of my peers seemed more intent on achieving grades.

ENERGY ANALYST
KATE TOMFORD '99
CHICAGO TRANSIT AUTHORITY

As a freshman at Harvard, I chose to concentrate in EPS to pursue interests I had developed through a summer geology program in Alaska that I attended during high school. Concentrating in EPS enabled me to take courses across a variety of science departments at Harvard, to interact closely with professors and fellow students in small classes, and to learn through hands-on experiences in the field, geochemistry labs, and computer labs. In my job at the Chicago Transit Authority, I manage initiatives to reduce energy use, control energy costs, and improve the environmental impact of the energy use that is required. Perhaps most importantly for my job today, EPS prepared me to interpret technical studies, design and perform quantitative analyses, and draw conclusions from observations. It also gave me a deep appreciation of the trade-offs between development and conservation of natural resources—balance that I think about every day in the context of energy policy and energy use.

PORTFOLIO MANAGER
ARTHUR WHITE '94, PHD

I did not know my ideal job nor the trajectory I would follow when I entered my first year at Harvard. I chose what I was most interested in pursuing, while always keeping a thought to what I might be able to do next. After surviving Prof. Brian Wernicke's Introduction to Geological Sciences, spring 1991, I realized that a geology concentration with EPS, offered me a chance to think about some of the really big questions governing the mechanics of our world while combining scientific discipline with outdoor adventure. I was thrilled. My senior-year thesis with Prof. Ulrich Petersen on ore deposits in South America led to a PhD opportunity to study the orogenic evolution of the East Greenland Caledonides. Subsequently, I found myself transitioning from academia to finance, and now I am a portfolio manager overseeing a book of complex investments in the natural resource, energy, and commodity space.

EPS prepared me to interpret technical studies, design and perform quantitative analyses, and draw conclusions from observations. It also gave me a deep appreciation of the trade-offs between development and conservation of natural resources.

GRADUATE STUDENT
JONATHAN JACKSON '15
ASTRONOMY AND ASTROPHYSICS
PENN STATE

I've always been interested in studying the physical sciences, so when I entered my first few years at Harvard, I knew mostly what to expect academically. What I didn't expect was that I would find one of the most friendly and welcoming communities I've ever been a part of in the EPS department. From hanging out in the Hoffman 4th floor lounge to traveling the country on the AMAZING summer trips, the EPS department contributed so many memorable moments to my undergraduate experience and helped me realize that science can be a fun and personable venture. I'm currently entering my third year of graduate school in Astronomy and Astrophysics at Penn State and, in addition to providing me with a strong geophysics background that has helped me in my planetary science research, I have EPS to thank for showing me how to build a healthy working scientific community.

HIGH SCHOOL SCIENCE TEACHER
DAVID OLESH '06

I chose EPS for two reasons: great people and great field trips. The professors and students in the department formed a true community within Harvard, something rare in the undergraduate's academic world. The field trips cemented the community feeling and gave us a glimpse of the awesome diversity of forms and processes over the natural world. As a kid from a paved over city, EPS taught me a lot. Now I share the spirit and knowledge I gained in EPS with a new generation of environmental scholars as an Earth Science teacher in a New York City high school.

PROFESSOR
JENNIFER SMITH '96
DEAN OF THE COLLEGE OF ARTS AND SCIENCES
PROFESSOR OF EARTH AND PLANETARY SCIENCES AND ENVIRONMENTAL STUDIES
WASHINGTON UNIVERSITY IN ST. LOUIS

What drew me initially to EPS was the desire to do science outside; to apply the fundamentals of chemistry, physics, and biology to the integrated study of the natural world. My interest in the historical (and prehistorical) context for the environmental challenges we face today led me to graduate school, where I studied climate-driven changes in water resource availability over the past few hundred thousand years in Egypt. I continue to pursue similar studies (in Sudan, Iraq, and Syria, among other places) as a professor.

My current role as Dean of the College entails responsibility for the undergraduate academic experience (curriculum and advising) at Washington University, so my research has shifted towards understanding and improving student outcomes, with a focus on equity. Leading geological field projects around the world developed a lot of the skills I use more frequently now—e.g., negotiation, team management, cross-cultural communication—and teaching a first year seminar on climate change has been a great way to stay current and connected to Earth science.

CIVIL ENGINEER AND LANDSCAPE ARCHITECT
TIM WONG '05

I entered Harvard with a love of the outdoors, so it was natural for me to choose EPS as my concentration. My classes in geology taught me how to study the land: an often neglected skill nowadays. Wanting to combine my interests in natural systems, the built environment, and artistic design, after undergrad, I enrolled at the landscape architecture program at the Harvard Graduate School of Design. Landscape architecture is the design of the outdoor environment, such as parks, gardens, and streetscapes. Many of my designs are inspired by the landforms and natural processes I studied in my EPS courses and field trips! EPS also provided technical know-how and comfort with studying and reshaping the land. I currently work at a civil engineering and landscape architecture design firm in the Boston area, designing parks, playgrounds, housing developments, and college campuses.

EPS CAREERS:

Common employment for graduates with EPS degrees include:

- Education: Teaching at the elementary school through university level
- Legal: Environmental litigation or support in a government agency such as the US Environmental Protection Agency
- Research: Research at university, non-profit, and governmental research facilities
- Public Service: Environmental monitoring and analysis, operation and management of environmental facilities, administration of environmental regulations
- Medical/Veterinary: an EPS degree will prepare you for a career in the medical or veterinary realms

EPS CONTACTS

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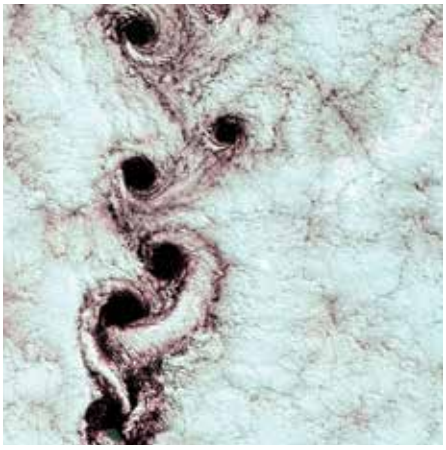
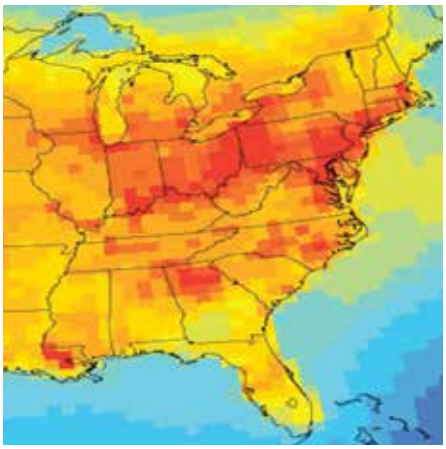
ENVIRONMENTAL SCIENCE & ENGINEERING





Our society's influence on the natural world's ecosystems and resources has never been more prominent or problematic than it is today. In order to better understand and address environmental challenges, environmental scientists and engineers provide technical solutions and advance innovations in environmental measurements, modeling, and control through the application of scientific and engineering principles.

Harvard has long been a pioneer in environmental education and research. This tradition continues today with faculty that are committed to teaching and researching engineered solutions to problems in the atmospheric, terrestrial, and aquatic compartments of the environment.

Undergraduate research and design projects in Environmental Science and Engineering cut across departments and schools, and cover topics in environmental technology, atmospheric sciences, environmental chemistry, pollutant cycling and toxicology, microbiology, energy, climate, and oceanography.

WHY ENVIRONMENTAL SCIENCE & ENGINEERING?

Students in Environmental Science and Engineering (ESE) study the fundamental processes and technologies underlying environmental systems, including natural and polluted waters and soils, the atmosphere, climate, and energy. Students learn to apply these principles to develop solutions to complex environmental problems and to mitigate human impacts on the environment.

Students interested in Environmental Science & Engineering have the option to pursue the ESE track of a Bachelor of Arts (A.B.) in Engineering Sciences or an ABET-accredited Bachelor of Science (S.B.) in Engineering Sciences. While students in either degree program take many of the same upper-level ESE courses, the A.B. program offers the opportunity to study complementary disciplines from other natural and social sciences, and the S.B. program provides a broader basis in engineering fundamentals with courses from other engineering areas and design. The broad-based, multidisciplinary curriculum of the Engineering Sciences concentration offers rigorous preparation for students planning to work as practicing engineers or researchers, entering graduate school, and for those preparing for careers in business, education, government, or law. The program's structure encourages students to make the most of Harvard's resources, such as taking courses in other departments, collaborating with researchers from other fields or schools, and taking advantage of the wealth of extracurricular activities available.

ENVIRONMENTAL ENGINEERS USE SCIENTIFIC AND ENGINEERING PRINCIPLES TO:

- Protect human health from adverse environmental conditions
- Protect local and global environments from deleterious effects of human activities
- Measure, model, and improve environmental quality
- Evaluate and model climate change and climate/energy interactions

ESE OFFERS:

- The opportunity to pursue the technical depth of an engineering degree within the liberal arts and residential life setting of Harvard College
- A direct connection to the cutting-edge research at the Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) including undergraduate research opportunities during the regular term and over the summer
- An individual senior capstone design project for all S.B. students, and the opportunity for A.B. students to conduct original research with guidance from SEAS faculty resulting in a senior thesis
- Small classes that give students direct access to professors
- A dedicated advising team for each student, including an individual faculty adviser and the Associate Director of Undergraduate Studies in Environmental Science and Engineering
- Opportunities to learn outside of the classroom through extracurricular activities. For example, Engineers Without Borders is working to improve drinking water quality for a community in the Dominican Republic, and all SEAS students are eligible to apply for Nectar Funding Grants to support their independent co-curricular initiatives in engineering and applied science

WHY I CHOSE ESE

The reason I chose this concentration is that not only is it the smallest track within the engineering department (allowing all the students to know each other as well as the professors) but it is one of the most flexible concentrations. I can take my electives with the Earth and Planetary Sciences Department, which in itself is such a small concentration allowing students to take advantage of a large number of resources. The subject itself is of great interest since I would like to have the skills in the future to get involved in environmental engineering projects, particularly those in underdeveloped countries. In the future, I would like to work on development projects that provide clean energy to rural areas in under-developed countries with scarce resources.

LAILA KASURI '13
ESE PRIMARY

I choose ESE because I wanted to learn about issues concerning the environment from an engineering perspective. I am interested in learning the problems facing the environment and how we as engineers can help solve them.

ALISON LEE '12
ESE PRIMARY

I chose ESE for a number of reasons. First of all, I was interested in environmental science and climate issues in general when I was initially looking at and applying to colleges, and I knew that I wanted to study them at a more advanced level. But I think the real appeal of ESE for me was the hands-on, applied aspect that engineering offers. I learn better with labs and when I understand the applications of what I'm learning about to the real world. ESE offers a really great combination of all those things, which made it a really ideal concentration for me.

CAROLINE QUAZZO '12
ESE PRIMARY

I chose ESE because of its future. There are so many important decisions to be made about energy and resources in the near future and I want to be a part of it. I chose ESE because it is a constantly changing field, bringing forth new problems and it is our job to create the solutions.

SARAH CAMPBELL '12
ESE PRIMARY

I joined ESE because I wanted to go into business and wanted the technical background to succeed in the green tech industry. With Harvard's engineering department, as well as the University's myriad opportunities, I was able to explore technological advances in the environmental field. Harvard treats its engineers well, with food, mentorship, and a small but growing community. I'm proud to be a Harvard engineer!

HEIDI LIM '14
ESE PRIMARY

I have chosen to concentrate in ESE for three main reasons. ESE is: (1) Exciting because it is a new and developing engineering field—combining a variety of classic engineering disciplines with developing social questions that will define important global decisions in the coming decades; (2) Professionally significant because governments and companies alike are focusing increasing efforts on environmental considerations; (3) Socially responsible because the conservation and proper use of Earth's environment has become one of the world's most important moral questions.

GREGORIO GOMEZ '15
ESE PRIMARY

"I am interested in learning the problems facing the environment and how we as engineers can help solve them."

ENVIRONMENTAL SCIENCE AND ENGINEERING COURSE SEQUENCE

The curriculum for the Engineering Sciences concentration is highly structured, with advanced courses building on the knowledge acquired in math, science, and introductory engineering coursework. ESE courses provide opportunities for students to receive rigorous training in engineering design, computer modeling, and mathematical, chemical, and biological analysis of natural systems, with examples drawn from aquatic, terrestrial, and atmospheric environments.

The chart below lists the recommended courses for potential ESE concentrators to consider taking within their first four terms at Harvard. Students are cautioned that it is more important to derive a solid understanding of these basic subjects than to complete them quickly without thorough knowledge, as this material is used extensively in many subsequent courses. Each student's plan of study and trajectory through the curriculum is unique, so we encourage you to contact the Associate Director of Undergraduate Studies for advice on course selection.

ES	ES 6	**Introduction to Environmental Science and Engineering**
CS	CS 50	**Introduction to Computer Science I**
MATH	Math 1a	**Introduction to Calculus** *and*
	Math 1b	**Calculus, Series, and Differential Equations**
	and	
	Math 21a	**Multivariable Calculus** *and*
	Math 21b	**Linear Algebra and Differential Equations**
	or	
	Applied Math 21a	**Mathematical Methods in the Sciences** *and*
	Applied Math 21b	**Mathematical Methods in the Sciences**
		Begin according to placement
CHEMISTRY	Physical Sciences 11	**Foundations and Frontiers of Modern Chemistry: A Molecular and Global Perspective**
	and	
	Life Sciences 1a	**An Integrated Introduction to the Life Sciences: Chemistry, Molecular Biology, and Cell Biology** *or*
	Physical Sciences 10	**Quantum and Statistical Foundations of Chemistry**
PHYSICS	Applied Physics 50a	**Physics as a Foundation for Science and Engineering Part I** *and*
	Applied Physics 50b	**Physics as a Foundation for Science and Engineering Part II**
	or	
	Physical Sciences 12a	**Mechanics** *and*
	Physical Sciences 12b	**Electromagnetism and Statistical Physics**
	or	
	Physics 15a	**Introductory Mechanics and Relativity** *and*
	Physics 15b	**Introductory Electromagnetism and Statistical Physics**
	or	
	Physics 16	**Mechanics and Special Relativity** *and*
	Physics 15b	**Introductory Electromagnetism**

ENVIRONMENTAL SCIENCE AND ENGINEERING CONCENTRATION REQUIREMENTS
(14-16 COURSES FOR AB, 20 COURSES FOR SB)

AB IN ENGINEERING SCIENCES—ENVIRONMENTAL SCIENCE AND ENGINEERING TRACK (14-16 COURSES)

GENERAL ENGINEERING SCIENCES REQUIREMENTS:

1. MATHEMATICS (2-4 courses, *begin according to placement*)	Math 1a & 1b	*and*	Applied Math 21a & 21b *or* Math 21a & 21b *or* Math 23a & 23b
2. PHYSICS (2 courses)	Physical Sciences 12a *or* Physics 15a or 16 *or* Applied Physics 50a	*and*	Physical Sciences 12b *or* Physics 15b *or* Applied Physics 50b
3. COMPUTER SCIENCE (1 course)	Computer Science 50, 51, *or* 61		
4. SOPHOMORE FORUM	Sophomore year. *Non-credit. Spring term.*		

ENVIRONMENTAL SCIENCE AND ENGINEERING TRACK REQUIREMENTS:

5. REQUIRED (3 courses)	Engineering Sciences 6	*and*	CHEMISTRY: *(Select 2 from below)* Physical Sciences 1 Physical Sciences 10 *(recommended)* Physical Sciences 11 *(recommended)* Life Sciences 1a
6. ESE CORE (3 courses)	*Select three from:* Engineering Sciences 109, 112, 130, 131, 132, 133, 135, 160, 161, 162, 163, 164, 165, 166		
7. APPROVED ELECTIVES (3 courses)	*Select three from:* Engineering Sciences 91r (one term only), 109, 112, 123, 130, 131, 132, 133, 135, 137, 160, 161, 162, 163, 164, 165, 166, 169, 181, 220, 265, 267, 268, 269 Earth and Planetary Sciences 134, 138, 186, 187, 208, 236 *No more than one from* Engineering Sciences 50, 51, 53, or Earth and Planetary Sciences 50 *No more than one from* Engineering Sciences 52, 153, 154 *No more than one from* Engineering Sciences 111, 115, 121, 150, Statistics 110, Applied Math 101, 104, 105, or 108		

SB IN ENGINEERING SCIENCES—ENVIRONMENTAL SCIENCE AND ENGINEERING TRACK (20 COURSES)

GENERAL ENGINEERING SCIENCES REQUIREMENTS:

1. MATHEMATICS (4 courses, *begin according to placement*)	Math 1a & 1b		
	Applied Math 21a & 21b *or* Math 21a & 21b *or* Math 23a & 23b		
	If starting in Mathematics 1b, 21a or 23a, or Applied Mathematics 21a **Probability and Statistics:** *One of* Applied Mathematics 101, Engineering Sciences 150, or Statistics 110		
	If starting in Mathematics 21a or 23a or Applied Mathematics 21a **Applied Mathematics:** *One of* Applied Mathematics 104, 105, 106, *or* 107		
2. PHYSICS (2 courses)	Physical Sciences 12a *or* Physics 15a or 16 *or* Applied Physics 50a	*and*	Physical Sciences 12b *or* Physics 15b *or* Applied Physics 50b
3. COMPUTER SCIENCE (1 course)	Computer Science 50, 51, *or* 61		
4. ENGINEERING DESIGN (2 courses)	Engineering Sciences 96	*and*	Engineering Sciences 100hf
5. SOPHOMORE FORUM	Sophomore year. *Non-credit. Spring term.*		

ENVIRONMENTAL SCIENCE AND ENGINEERING TRACK REQUIREMENTS:

6. CHEMISTRY (2 courses)	*Select two from:* Life Sciences 1a Physical Sciences 1 Physical Sciences 10 Physical Sciences 11 *(recommended)*
7. ESE CORE (5 courses)	Engineering Sciences 6 *Select four from:* Engineering Sciences 109, 112, 123, 130, 131, 132, 133, 135, 160, 161, 162, 163, 164, 165, 166, 169
8. ENGINEERING BREADTH (3 courses)	Choose one upper-level (>100) course from each of the following depth areas *(see the Student Handbook for complete list of eligible courses in each area)*: a. Mechanics and Materials b. Electrical c. Engineering Physics and Chemistry
9. ENGINEERING ELECTIVE (1 course)	Select one course on engineering topics from any engineering depth area *(see the Student Handbook for complete list of eligible courses)*

WHERE YOUR ESE DEGREE CAN TAKE YOU

ENVIRONMENTAL ENGINEER
MARY BOGGS '06

An ESE degree has helped prepare me for a career in designing and applying remedial solutions to environmentally-hazardous scenarios across the country. The ESE degree helped me by teaching me the science/chemistry/physics behind the air, water, and soil, as well as how to think when attempting to design the solution. I am currently employed at Weston Solutions as an environmental engineer and so far, I have participated in air quality monitoring on the Louisiana Delta in the aftermath of the Deepwater Horizon Oil Spill, the characterization of a volatile organic carbon plume in a confined aquifer underneath the Aberdeen Proving Grounds in Maryland, the cleanup of lead dust in residences in a small borough in eastern Pennsylvania, and the conduction of a chemical inventory of unknown substances found in both abandoned warehouses and existing residences. I feel I am making a difference by helping the local and national communities in cleaning up our planet and solving these complex problems.

REMEDIATION CONSULTANT
JIM GRUNDY '09

A degree from the ESE program gives you the technical background and writing skills to excel in the field of environmental remediation consulting. The focus on preparation of scientific reports and papers during the undergraduate ESE program translates well to writing of remedial specifications and regulatory reports, while the subjects learned in the ESE program give you the tools needed to solve remediation problems both in the office and in the field. The ESE program also teaches undergraduates time management and efficiency skills, which are very important skills for success in the competitive world of environmental consulting.

CORPORATE STRATEGY ANALYST
ZANDER SEBENIUS '13

Spending four years in the ESE department helped me to develop the passion and tools necessary to change the way that we generate and consume energy. Since graduating in 2013, I have working in the Corporate Strategy Group at Flextronics, one of the largest electronics manufacturing companies in the world. I have applied my ESE-derived knowledge about renewable energy technology to help Flextronics develop its five-year energy business plan, develop a new LED lighting business, and create a new engagement model for Flextronics to work with innovative start-ups. Moreover, the rigorous ESE curriculum has trained me to problem solve effectively and venture into unexplored areas—in both science and business—with full confidence of success.

MANAGEMENT CONSULTANT
ALEXANDER PADDINGTON '07

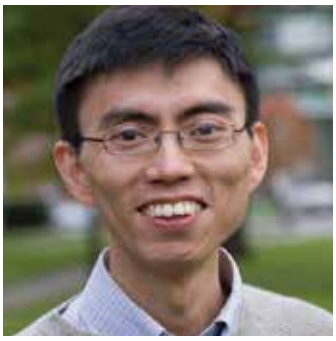
Since graduation I have been working in management consulting for Oliver Wyman in New York with an ESE degree, able to leverage quantitative background and branch out and work in financial services. I have focused on consulting to the largest financial services firms in the world on strategy, operational and risk concerns. I have also been able to leverage my engineering background for more quantitative projects, many involving complex Excel models including valuation of distressed RMBS and ABS securities.

ESE CAREERS:

Common employment sectors (with example job responsibilities) for graduates with ESE degrees include:

- Education and Research: Teaching at the high school through university level, cutting-edge environmental research at universities and government research centers
- Public Service: Environmental monitoring and analysis, operation and management of environmental facilities, administration of environmental regulations
- Engineering Consulting: Design of treatment facilities and remediation processes, investigations of pollutant transport, studies of energy efficiency and sustainability
- Industry: Evaluate and implement corporate environmental strategies and regulatory compliance
- Non-Governmental Organizations: Technical environmental projects to support the organization's mission, public education and outreach, environmental policy advocacy

ESE CONTACTS



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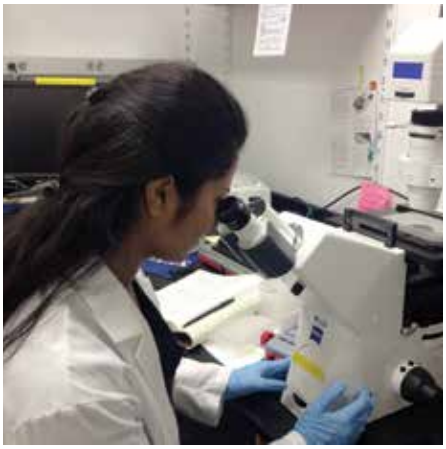
ENVIRONMENTAL SCIENCE & PUBLIC POLICY



The concentration in Environmental Science and Public Policy (ESPP) is designed to provide a multidisciplinary introduction to current challenges and issues of the environment. It is founded on the premise that the ability to form rational judgments concerning many of the complex challenges involving the environment that confront today's society requires both an understanding of the underlying scientific and technical issues and an appreciation for the relevant economic, political, legal, historical, and ethical dimensions.

WHY ENVIRONMENTAL SCIENCE & PUBLIC POLICY?

All students have to satisfy a core of requirements in the physical, biological, and social sciences and mathematics. Concentrators in consultation with their advisor develop an individual plan of study for a series of advanced courses around a particular field of specialization. Through their field of specialization, students develop expertise in a particular field of study relating to the environment. In the senior year, students undertake a capstone project in which they conduct an in-depth examination of a particular environmental issue consistent with their field of specialization, applying skills and knowledge gained in their courses and tutorial experiences.

The concentration is overseen by a Committee on Degrees functioning as a Board of Tutors including representatives from several FAS Departments and from other Schools as appropriate to ensure the requisite breadth of the program. The faculty serve as concentration advisors, thesis advisors and are valuable resource for concentrators.

Our concentrators appreciate the breadth and flexibility of course requirements and their close interactions with faculty. Concentrators also enjoy being in the field, and we offer opportunities for concentrators to conduct work in the field in both course and group settings. We also support independent student research under faculty guidance.

ESPP OFFERS:

- Interdisciplinary approach to solving environmental problems
- Create and develop your field of specialization with faculty guidance
- All ESPP concentrators have an individual faculty advisor
- Wide range of career options
- Field trips for concentrators
- Flexible course offerings
- Many options for supervised independent student research projects
- Faculty oversight provided by faculty members from FAS (including the departments of EPS, Economics and OEB), the Business School, the Graduate School of Design, the Kennedy School of Government, the School of Public Health and the School for Engineering and Applied Sciences
- Faculty led Junior Tutorial/Seminar program with small class sizes and low student/faculty ratio. Topics include:
    - World Food Systems and the Environment
    - Current Issues in U.S. Environmental Law
    - Climate Policy — Past, Present and Future
    - Planetary Health: Understanding the Human Health Impacts of Accelerating Environmental Change
    - Conservation Biology
    - China's Energy Economy: Perspectives from the Past: Challenges for the Future
    - The Technology, Economics and Public Policy of Renewable Energy

"…designed to provide a multidisciplinary introduction to current challenges and issues of the environment."

WHY I CHOSE ESPP

As a freshman, ESPP appealed to me as a concentration in which I could receive individual attention and guidance through an expansive set of resources spanning multiple departments. Upon declaring my concentration sophomore fall, it was clear to me that by fulfilling the ESPP degree requirements I would gain a broad education in the natural world and a deep understanding of how to analyze and solve problems surrounding our complex interactions with it. As I pursue a career in natural resource economics I take with me the invaluable experiences of the two ESPP 90 Seminars I have taken. These small, focused classes have afforded me the opportunity to interact with guest lecturers from across the globe—experts in innovation and technology, biotechnology and GMOs, environmental health, particulate air pollution, solid waste, and indoor air quality. In addition to discussing their work, these experts shared their experiences and career paths, providing advice that was as valuable as the cutting-edge research they shared with us.

ETHAN ADDICOTT '14
ESPP PRIMARY

What I value most about my ESPP experience are the relationships I formed. The sense of community and the opportunities to connect with peers in the lab and in intimate seminars enabled me to find mentors among my professors and close friends among my classmates.

In my experiences in private and public sector work environments since graduation, I have used the skills I learned in the ESPP program--a deeper scientific understanding of the natural world, the ability to ask challenging questions about our relationship with it, and the analytical tools to approach policy issues from economic and ethical perspectives. As I continue my graduate studies, my experience in the program continues to inspire me to help solve what I believe are among the greatest challenges of our time.

BASIL WILLIAMS '14
ESPP PRIMARY

The ESPP experience is unique because of its inherent interdisciplinary nature and has challenged me to analyze environmental issues from a range of perspectives (scientific, political, economic, legal, etc.). ESPP allows students to take advantage of the expansive resources of several departments and receive the individualized support of a smaller department. The breadth and depth of the concentration afforded me the opportunity to gain a broad understanding of the natural world while also gaining a deeper knowledge in my area of specialization.

However, the best part of the ESPP department is the people. Whether through the classroom, extracurriculars, or department field trips, I have formed invaluable relationships with other students that share my passion and interest in environmental concerns. I also benefitted from working very closely with a welcoming faculty through research and seminars. As I embark on a career in solar energy, I am confident that my ESPP experience prepared me well to think critically about complex environmental problems.

PATRICK DOWLING '16
ESPP PRIMARY

I knew I wanted to do a secondary in ESPP almost before I had picked my concentration. Growing up in Oregon, I was raised with an appreciation for the natural world and had always been interested in the intersection between people and their environments. While my real strengths and passions were on the social side of things (which is why I ultimately concentrated in anthropology) I knew that the tangible skill set I would gain from studying environmental policy and science courses would add a level of both specialty and credibility to my undergraduate degree. The best part was that these courses were so flexible; I fulfilled some of my requirements with courses I took while studying abroad in Ecuador, as well as others more related to my thesis. In addition, the guidance and expertise of the professors in the department has been an invaluable asset in moving towards my academic and professional goals. For me, having a deeper understanding of the natural world (from ecology to climate change) has resulted in a deeper understanding of the human world, and I feel have truly benefitted from studying ESPP.

ANNELI TOSTAR '15
ESPP SECONDARY

I chose to study ESPP because all governments, companies, and communities are thinking about environmental challenges on some level, and I want to be a part of growing efforts to address those challenges. I was also attracted to this concentration because it allowed me to fully experience a liberal arts education by exposing me to and integrating multiple fields of study. The ESPP program at Harvard has provided me with a valuable, interdisciplinary understanding of environmental challenges, while flexibly enabling me to focus on aspects that I am most interested in. I am incredibly grateful for the close attention that the faculty and staff pay to their students. Given the multilayered nature of our subject matter, it was crucial to be able to work with mentors and administrators who could help me develop a clear academic vision and concrete research goals.

REYLON YOUNT '16
ESPP PRIMARY

ENVIRONMENTAL SCIENCE AND PUBLIC POLICY COURSE SEQUENCE

A true interdisciplinary concentration, we have course requirements in the physical, biological, and social sciences and mathematics. It is important for students to take the foundational courses in their first and second year so that they are prepared for more advanced courses later. Students are encouraged to take more advanced courses where appropriate. Please contact the undergraduate coordinator or Head Tutor with questions about placement and course selections.

The chart below lists courses ESPP recommends students consider taking within their first three terms at Harvard. Each student's plan of study and trajectory is different so we encourage you to contact us directly for advice on course selection.

INTRO-DUCTORY COURSES	ESPP 11	**Sustainable Development** *or*
	EPS 50	**The Fluid Earth: Oceans, Atmosphere, Climate, and Environment** *or*
	ES 6	**Introduction to Environmental Science and Engineering** *or*
	SPU 25	**Energy and Climate: Vision for the Future** *or*
	SPU 29	**The Climate-Energy Challenge** *or*
	SPU 31	**Energy Resources and the Environment** *or*
MATH	There are several options for fullling the requirement of two-half courses in mathematics or statistics. The minimum requirement is Math 1a and 1b. More advanced courses can be chosen. *Begin according to placement.*	
BIOLOGICAL SCIENCES	OEB 10	**Foundations of Biological Diversity** *or*
	LS 1a	**An Integrated Introduction to the Life Sciences: Chemistry, Molecular Biology, and Cell Biology** *or*
	LS 1b	**An Integrated Introduction to the Life Sciences: Genetics, Genomics, and Evolution** *or*
	OEB 55	**Ecology: Populations, Communities and Ecosystems**
PHYSICAL SCIENCES	Physical Sciences 1	**Chemical Bonding, Energy, and Reactivity: An Introduction to the Physical Sciences** *or*
	Physical Sciences 11	**Foundations and Frontiers of Modern Chemistry: A Molecular and Global Perspective** *or*
	EPS 135	**Physics and Chemistry: In the Context of Energy and Climate at the Global and Molecular Level**

ENVIRONMENTAL SCIENCE AND PUBLIC POLICY CONCENTRATION REQUIREMENTS
(13-14 COURSES)

1. ESPP INTRODUCTORY COURSE (1 course)	ESPP 11 Sustainable Development *or* EPS 50 The Fluid Earth: Oceans, Atmosphere, Climate, and Environment *or* ES 6: Introduction to Environmental Science and Engineering *or* SPU 25 Energy and Climate: Vision for the Future *or* SPU 29 The Climate-Energy Challenge *or* SPU 31 Energy Resources and the Environment		
2. PHYSICAL SCIENCES (1 course)	Physical Sciences 1 *or* Physical Sciences 11 *or* EPS 135		
3. MATHEMATICS (2 courses, *begin according to placement*)	Math 1a & 1b	*or*	Math 1b *and one of the following:* Math 18, Math 19a, Math 21a Stats 100, Stats 102, Stats 104, OEB 153 *or* Applied Math 21a
	Math 19 or Math 21a or AP Math 21a *and one of the following:* Stats 100, Stats 102, Stats 104, OEB 153	*or*	Math 19a & 19b *or* Math 21a & 21b *or* Applied Math 21a & 21b
4. BIOLOGICAL SCIENCES (1 course)	OEB 10 *or* LS 1a *or* LS 1b *or* OEB 55		
5. SOCIAL SCIENCES (1 course)	ESPP 77	*or*	ESPP 78
6. ECONOMICS (1 course)	EC1661 *(Depending on a student's background, an additional course in Microeconomics may be required in order to take EC 1661.)*		
7. ADVANCED COURSES (4 courses, in the student's field of specialization)	At least one course must be from the social sciences/policy, and at least one course must be chosen from the natural sciences or engineering. One course must be in EPS unless a student has taken EPS 22, ES 6, SPU 25, SPU 29 or SPU 31 as their Introductory Course (see 1 above).		
8. JUNIOR SEMINAR (1 course)	ESPP 90 (Consistent with focus field of specialization.)		
9. SENIOR PROJECT (1-2 courses)	ESPP 91r Non-Honors (1 course), Capstone Project (In the capstone project, students conduct an in-depth examination of a particular environmental issue consistent with their field of specialization (the typical requirement is a term-paper or equivalent).	*or*	ESPP 99 Honors (2 half-courses), Senior Thesis (For students wishing to be considered for honors, the capstone project consists of a two course senior thesis.)

ENVIRONMENTAL SCIENCE AND PUBLIC POLICY SECONDARY REQUIREMENTS
(5 COURSES AND COLLOQUIUM PARTICIPATION)

Through the ESPP secondary field, students become well-versed in the broad, interconnected issues of environment and public policy through course work and a colloquium. Students choose courses in biology, chemistry, earth and environmental sciences, economics, government, engineering, and mathematics, complementing their primary studies with courses that will provide balanced exposure to environmental science and policy perspectives.

REQUIREMENTS

The ESPP secondary field requires the successful completion of 5 courses, including one foundational course and four upper-level courses. Students must also participate in a program colloquium, as outlined below.

STUDENTS CHOOSE ONE OF THE FOLLOWING FOUNDATIONAL COURSES:

- ESPP 11: Sustainable Development *or*
- EPS 50: The Fluid Earth: Oceans, Atmosphere, Climate and Environment *or*
- ES 6: Introduction to Environmental Science and Engineering *or*
- SPU 25: Energy and Climate: Vision for the Future *or*
- SPU 29: The Climate-Energy Challenge *or*
- SPU 31: Energy Resources and the Environment

STUDENTS MUST CHOOSE AT LEAST FOUR ADDITIONAL UPPER-LEVEL COURSES

At least two courses must be chosen from each of two elective categories: Social Sciences and Public Policy, and Natural Sciences and Engineering. The complete list of course options can be found on the ESPP website: http://espp.fas.harvard.edu/.

COLLOQUIUM

During each semester there are several opportunities for ESPP secondary field students to come together to explore various environmental topics through facilitated discussions. These discussions require preparatory readings and/or prior attendance at a public lecture on campus, and students are required to attend at least one session per semester once they have been accepted into the program.

ENERGY & ENVIRONMENT SECONDARY FIELD REQUIREMENTS
(4 COURSES AND COLLOQUIUM PARTICIPATION)

The energy-environment challenge is a defining issue of our time, and one of Harvard's greatest contributions to meeting that challenge will be the education of a new generation of leaders in science, business, law, design, and public service. To this end, the Environmental Science and Public Policy (ESPP) program, in coordination with the Harvard University Center for the Environment (HUCE), is pleased to offer the secondary field in Energy and Environment (E&E). Through coursework and a colloquium, students engaged in the E&E secondary field will increase their exposure to, and literacy in, the interdisciplinary nature of issues related to energy and the environment.

In the context of the E&E secondary field, "Energy" refers to the production, distribution, and use of energy by individuals and society for a variety of purposes. This includes the various technologies, policies, and challenges associated with meeting increasing global energy demands. "Environment" refers to the understanding of the relationships and balances of the natural and constructed world at multiple scales, including how anthropogenic activities and policies affect the relationships between energy demand, environmental quality, and climate change. Students from a wide range of concentrations, including the humanities, are invited to participate in the program to explore how different disciplinary perspectives on energy and environment intersect and inform one another.

REQUIREMENTS

The E&E secondary field requires the successful completion of 4 courses, including one foundational course and three upper-level courses. Students must also participate in a program colloquium, as outlined below.

STUDENTS CHOOSE ONE OF THE FOLLOWING FOUNDATIONAL COURSES, ALL OF WHICH INCLUDE CONTENT RELATED TO BOTH ENERGY AND ENVIRONMENT:

- SPU 25: Energy and Climate: Vision for the Future *or*
- SPU 29: The Climate-Energy Challenge *or*
- SPU 31: Energy Resources and the Environment *or*
- ESPP 11: Sustainable Development *or*
- ES 6: Introduction to Environmental Science and Engineering

STUDENTS CHOOSE THREE ADDITIONAL UPPER-LEVEL COURSES

At least one course must be chosen from each of two elective categories: Social Sciences and Humanities, and Natural Sciences and Engineering. The complete list of course options can be found on the ESPP website: http://espp.fas.harvard.edu/.

COLLOQUIUM

During each semester there are several opportunities for E&E secondary field students to come together to explore various energy and environmental topics through facilitated discussions. These discussions require preparatory readings and/or prior attendance at a public lecture on campus, and students are required to attend at least one session per semester once they have been accepted into the program.

WHERE YOUR ESPP DEGREE CAN TAKE YOU

ATTORNEY
AMY KOBELSKI TRUEBLOOD '00

I've really come to appreciate the depth and breadth of my Environmental Science and Public Policy education as a trial and appellate litigation attorney. The economics and public policy aspects were perhaps most foreign to me when I entered college, and I've found them to be particularly useful in reading and understanding legislation and—truly—the world around me every day. My concentration proved extremely valuable in defending a $100 million environmental legal malpractice action, but I also worked on antitrust matters that drew heavily on my economics background. ESPP gave me a phenomenal foundation on which to build specific knowledge as required by my career as a litigator. Moreover, my focus on environmental economics is something I think about nearly everyday when reading about world events.

CORPORATE BUSINESS PROFESSIONAL
ELIZABETH LEWIS '01
HEAD OF SUSTAINABLE INVESTING, WORLD RESOURCES INSITUTE

I credit ESPP with giving me a strong scientific understanding of the world's biggest long-term challenges–and inspiring me to focus my career on solving these challenges. My education on climate change education stands out. I was in college long before the world was talking about climate change, and my professors were on the cutting edge.

ESPP also taught me–through courses in diverse disciplines, and relationships with professors, alumni and other students–that the world was rapidly changing. It would be important to be flexible and take advantage of unexpected opportunities. After Harvard, I've spent most of my career in management consulting and private equity with a focus on technology innovation, energy and natural resource management. I believe in the power of innovation and capitalism to improve the livelihoods of people around the world and solve our biggest challenges. In the best circumstances, harnessing these forces requires pioneering leadership and people with a range of skills and experiences.

SURGEON
DR. JOSEPH LYNCH '98
ORTHOPAEDIC SURGEON, US NAVY

The ESPP program was extremely valuable in preparing me for my current career. ESPP provided breath in the sciences and allowed study of subjects which are unique, intriguing, and current. For those pursing medicine, ESPP was an ideal concentration as it facilitates completion of the typical "pre-med" requirements, but more importantly it affords an opportunity to explore one's talents in the sciences as applied to other fields. One of my fondest memories of Harvard was the concentration and the educational requirements of the degree—phenomenal!

POSTDOCTORAL SCHOLAR
JULIET LAMB '05
SOUTH CAROLINA COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT, CLEMSON UNIVERSITY

My undergraduate study was extremely useful. I have encountered many other graduate students and professionals in conservation biology who do not have any academic background in policy or law. In a field as integrative and interdisciplinary as fisheries and wildlife biology, I feel that I am at a huge advantage in having a solid understanding of the economic, legal, and governance aspects of conservation in addition to its scientific components. As an undergraduate, I shifted from a pre-veterinary focus dominated by broad chemistry, biology, and physics courses to a more organismic track. My happiest years in ESPP came at the end of my tenure, when I had begun to explore the small and focused classes in ESPP, OEB, EPS, etc. I wish I had identified earlier that my interests were in species and ecosystem conservation rather than veterinary medicine, because I would have been able to tailor my education more directly to my career. In my Master's and PhD studies, I have never been as impressed with the classes I've taken as I was with some of my ESPP classes.

PROFESSOR
JACLYN HATALA MATTHES '07
ASSISTANT PROFESSOR OF GEOGRAPHY, DARTMOUTH COLLEGE

My undergraduate education provided not only essential technical preparation for my present research, but was also the source of the intellectual motivation to pursue a career in environmental science in the first place. Before I "discovered" the ESPP concentration during my sophomore year, I felt a bit at a loss about how to negotiate my various interests in many scientific disciplines. The ESPP concentration allowed me to put together an interdisciplinary course of study with a rigorous foundation in ecology, chemistry, physics, and statistics. I also appreciated the breadth of study in ESPP through the requirements in economics and policy, and I have drawn on my experience in these courses while interacting with colleagues from different academic fields in my current work. I found the process of developing, researching, and writing a senior thesis and the mentorship that I received during this experience particularly enjoyable, and it inspired me to pursue a career in environmental research.

EDUCATION MANAGER
MARY FORD '96
NATIONAL AUDUBON SOCIETY

I'm the Education Manager at the National Audubon Society, and concentrating in ESPP was my first step towards this fascinating, fullling career. The interdisciplinary nature of ESPP taught me to think broadly about how to accomplish conservation, and gave me solid grounding in science, policy, economics, and communication skills. The comfort I gained in all those disciplines has served me well throughout my career, which has ranged from studying orangutans in Borneo, to working in a national park in Siberia, to teaching preschool, to working at World Wildlife Fund and Audubon.

ECONOMIST
GERNOT WAGNER '02
ENVIRONMENTAL DEFENSE FUND

I could not imagine a better preparation than ESPP to tackle the profound and often maddeningly complex challenges facing our planet. I am still in touch with my professors and teaching fellows who mentored me throughout college, and they continue to guide me in my career to this day.

PROFESSOR
FORREST BRISCOE '96
ASSOCIATE PROFESSOR
SMEAL COLLEGE OF BUSINESS
THE PENNSYLVANIA STATE UNIVERSITY

I wouldn't trade the ESPP experience for anything. It gave me a community—a really interesting group of people, places, ideas—not too big, not too small—that really fostered my growth at Harvard. One thing I valued a great deal was the chance to work with and get to know the faculty in ESPP. I was interested in exploring both the science side and the policy side, and was able to work on projects with cutting edge researchers in both areas. In ESPP this dove-tailed nicely with what I was doing in my classes, so it felt like everything was integrated and very relevant to the real world. Today, I teach in business school, and do research on how businesses and other organizations relate to a range of social problems. ESPP was actually great preparation for way I do now: it really got me thinking about how hard it is to apply scientific rigor to problems that have a heavy human component.

PHD CANDIDATE
MOLLIE HOGAN '01
DOCTORAL CANDIDATE IN HEALTH SERVICES
UNIVERSITY OF WASHINGTON

I work in global health measurement, and was well prepared for this area of work by ESPP, particularly via the courses on human health and the environment and the quantitative courses (such as calculus, ecology, economics). My senior thesis prepared me well for a career in critical independent research. After three years working as a technical officer measuring child health inequalities at the World Health Organization in Geneva, I worked in Thailand for almost four years on a health system priority setting project at the Ministry of Health. I am now working on my doctorate at the University of Washington in Health Services, focusing on the measurement of maternal mortality worldwide.

PROFESSOR
NOELLE ECKLEY SELIN ' 99
ESTHER AND HAROLD E. EDGERTON CAREER DEVELOPMENT ASSOCIATE PROFESSOR, DEPARTMENT OF EARTH, ATMOSPHERIC AND PLANETARY SCIENCES AT MIT

My ESPP experience gave me a thorough grounding in both the scientific and policy questions important to understanding the environment. After graduating, I spent a few years working on environmental policy issues in the US and Europe. When I decided to start a PhD program in atmospheric science, I had a solid scientific background in addition to a strong policy focus. I am now a faculty member in an interdisciplinary department, where my work builds on both my science and policy backgrounds. ESPP is a unique program, and my experiences as an ESPP concentrator at Harvard were a strong influence on where I am today. I even still refer back to my senior thesis!

STRATEGIC POLICY ADVISOR
ISABELLA WECHSLER '13
NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

The ESPP program was a seminal part of my Harvard experience. I loved the ESPP junior tutorials and took many provoking, inspiring classes that challenged my definition of "sustainability" and taught me to conceptualize stakeholders and problems in entirely new ways. The ESPP concentration gave me a series of frameworks to think about change, and through an emphasis on case studies and success stories, taught me that the most overwhelming obstacles can be tackled despite their daunting scope. In a field that bumps up against climate change in innumerable contexts, ESPP focused on concrete, actionable solutions and encouraged its students to seek hands-on experiences outside of class. Some of my favorite memories include creating a land-use plan for Lake Placid in Florida during a week-long field trip and sailing in Key West while exploring oceanographic research during J-term. In addition, my ESPP advisers and professors have been the kindest and most generous mentors and teachers. The depth of their knowledge and experience has nudged my own intellectual standards to another plane altogether, and I look forward to staying in touch with them throughout my career. I worked as an Urban Fellow in NYC and now as a Strategic Policy Advisor, and continue to be intrigued by the fascinating ways in which behavioral economics and psychology apply to environmental policy. I will be forever grateful to ESPP for opening my eyes and heart to the complex environmental issues that will demand the very best of our capacity for empathy and intellectual creativity.

ESPP CONTACTS

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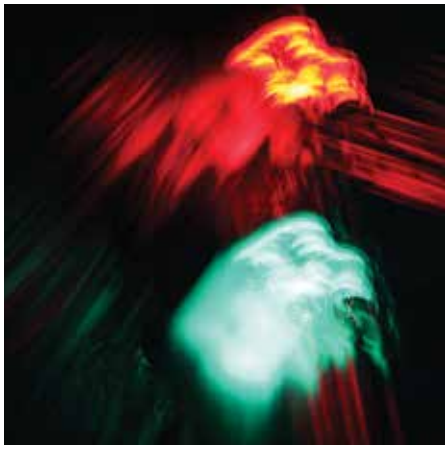
INTEGRATIVE BIOLOGY



George Evelyn Hutchinson described the history and dynamics of life as an evolutionary play in an ecological theater. The concentration in Integrative Biology (the concentration overseen by the Department of Organismic & Evolutionary Biology) is inherently interdisciplinary, encompassing mathematical and computational biology, functional and genetic approaches to morphology and development, as well as genetics, evolution, and ecology.

IB asks questions about the function, evolution, and interaction of organisms, both now, in the past, and in the future. What kinds of organisms are there and how are they related? How is an organism's functional design and behavior related to both its physical environment and its interactions with other organisms? What are the genetic and developmental mechanisms underlying an organism's morphology, or how is evolution influenced by development and vice versa? The concentration's new name reflects both the OEB department's broad research scope and scientific priority: to understand natural systems across levels of biological analysis. A detailed understanding of cellular processes, for example, can help us understand an organism's ecology.

The beauty of biology is revealed through the evolution of its complexity and the interactions of organisms in their environment...

"OEB is an amazing department, there's a huge variety of classes to take and all the professors are enthusiastic and accessible."

WHY I CHOSE OEB/IB

I loved OEB/IB for the flexibility it gave me to explore any and every aspect of biology—I could pick classes that genuinely interested me without feeling restrained by departmental requirements. OEB/IB classes themselves are phenomenal, and their faculty are incredibly invested in the students and courses they teach—this is evident both in the quality of their teaching and their willingness to mentor students. And, the OEB/IB community is incredible—you are surrounded by peers who love what they do, who are diverse in their interests and talents, and who and are collaborative and non-competitive. Being an OEB/IB concentrator was one of the best decisions I made at Harvard—the faculty, the peers, and the coursework made my academic experience at Harvard wonderful.

BONNIE WONG '13

OEB/IB is an amazing department, there's a huge variety of classes to take and all the professors are enthusiastic and accessible. Definitely take advantage of courses that have cool field trips or the summer school programs abroad. The best part about OEB/IB is its broad perspective; you learn why things in biology are the way they are, rather than simply learning about the applications (though you learn that as well).

JUSTINE CHOW '10

I am very glad that I chose IB as my concentration. I see it as the real liberal arts choice within biology because the flexibility of its requirements mean that you can both take time to explore different areas within biology and focus deeply on whatever interests you most. The program exposed me to a huge breadth of biological science and allowed me to figure out with confidence what parts I personally want to study in the future. The classes within the department teach you a ton while maintaining a fun environment. My IB classmates are great people and each of them has some specific interest or passion within biology; these varying interests make each class an opportunity to see whatever we are studying from different perspectives as everyone brings their own views, curiosity, and expertise.

ABBA PARKER '17

I loved being an OEB/IB concentrator—from as early as Visitas and the beginning of freshmen year, I felt that I was already welcomed into the concentration and that the advisors and instructors were very accessible and happy to talk about ways to get involved and explore the subject. I have found everyone in OEB, from fellow concentrators to grad students to faculty, to be extremely friendly, kind, and willing to help—so as far as concentrations have a culture, I think OEB/IB has a fantastically open one. Among the many awesome qualities that OEB/IB possesses is the variety of students in the concentration - people interested in a wide spectrum of topics, from bird identification to genetic analysis to computational biology to conservation, among many others—and having the opportunity to take classes on this breadth of topics within OEB, as well as to learn from the various passions of your classmates, was a highlight of my experience. OEB/IB really lets you make what you want of your class schedule and of your academic studies as a whole, and with few fixed requirements students have the flexibility to study whatever most interests them within this field. There are also wonderful opportunities to study abroad and to get funding to travel and do research. Additionally, OEB/IB is one of the few concentrations that regularly has field trips for many of its classes—and even outside of class, there are organized social events and trips to OEB/IB-related activities and places in and around campus/Boston. Being an OEB/IBer definitely helped me further my academic passions that I had coming into college, and shape and focus them into my aspirations for the future.

PRERNA BHAT '16

INTEGRATIVE BIOLOGY COURSE SEQUENCE

The study of IB can be approached in many ways, reflecting primary interest in specific groups (e.g., plants, animals, micro-organisms); in a particular level of organization (e.g., ecological systems, evolutionary genetics); in an approach (e.g., biomechanics, developmental biology); or even in a desire to sample broadly across many topics.

Recognizing the value of learning about organisms in their natural habitats, IB offers a number of courses with significant field components. For some, this involves short trips to local environments of interest; for others, spring break sees the course re-locate to the Tropics. For example, OEB 51 (Invertebrate Biology) goes to coral reefs in Panama, and OEB 167 (Herpetology) to Costa Rica.

The chart below lists courses IB recommends students consider taking within their first three terms at Harvard. Each student's plan of study and trajectory is different so we encourage you to contact us directly for advice on course selection.

LIFE SCIENCES	Life Sciences 1A	**An Integrated Introduction to the Life Sciences: Chemistry, Molecular Biology, and Cell Biology** *(fall)*
	or	
	Life & Physical Sciences A	**Foundational Chemistry & Biology** *(fall)*
	or	
	Life Sciences 50A	**Integrated Science** *(fall)*
	and	
	Life Sciences 1B	**An Integrated Introduction to the Life Sciences: Genetics, Genomics, and Evolution** *(spring)*
	or	
	Life Sciences 50B	**Integrated Science** *(spring)*

*Pre-medical students should consider Physical Sciences 1 (spring) to allow them to take the Organic Chemistry sequence (Chemistry 17-27) as sophomores.

OEB	OEB 10	**Foundations of Biological Diversity** *(fall)*
	Senior Thesis	*Required for highest honors*

INTEGRATIVE BIOLOGY CONCENTRATION REQUIREMENTS
(13 COURSES)

3 COURSES IN INTRODUCTORY BIOLOGY:

LIFE SCIENCES 1A (or LIFE & PHYSICAL SCIENCES A or LIFE SCIENCES 50A)
LIFE SCIENCES 1B (or LIFE SCIENCES 50B)
OEB 10

4 COURSES INTRODUCING BROAD FIELDS OF BIOLOGY

To be chosen from OEB 50, 51, 52, 53, 54, 55, 56, 57, 59; MCB 52, 54, 60, 80; Life Sciences 2, 110; SCRB 10, 25.

COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:

2 ADVANCED-LEVEL COURSES IN BIOLOGY *(one of which may be a supervised research or reading course)*

COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:

4 ADDITIONAL COURSES IN RELATED FIELDS

To be chosen from offerings in applied mathematics, chemistry, mathematics (above the level of Math 1a), computer science (above the level of Computer Science 1), physics, and statistics.

COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:

INTEGRATIVE BIOLOGY SECONDARY REQUIREMENTS
(5 COURSES)

A Secondary Field in Integrative Biology (IB) is offered by the Department of Organismic and Evolutionary Biology (OEB). Members of faculty in OEB study biological systems at all levels from molecules to ecosystems, united by a shared foundation in evolutionary biology. Our department offers courses in a broad range of topics, including (in alphabetical order): anatomy, behavior, biomechanics, development, ecology, entomology, evolution, forestry, genetics, genomics, marine biology, microbiology, molecular evolution, mycology, oceanography, paleontology, physiology, plant sciences, systematics, and zoology. OEB is also happy to give secondary field credit for relevant courses taken during a Study Abroad semester.

Students may have an interest in pursuing a secondary field of study in a particular sub-discipline, or may prefer to sample broadly across the offerings of the department. Rather than draft a set of requirements for each possible field of study, the department chose a flexible set of requirements that should maximize students' freedom to craft their own programs in consultation with an academic adviser.

A secondary field requires the completion of five courses in OEB. For this purpose all courses listed in the OEB section of the *Courses of Instruction*, including cross-listed courses, as well as Life Sciences 1b and Life Sciences 2, will count as courses in OEB.

OEB COURSES

COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:
COURSE:	TERM/YEAR:

WHERE YOUR IB DEGREE CAN TAKE YOU

SCIENCE WRITER NATALIE JACEWICZ '13

Concentrating in OEB/IB was one of the best decisions I made in college. You will have down-to-earth and accessible professors, friendly peers, and Caribbean-based classes. You will also have access to amazing lab work and museum collections, making you the koolest kid eva. Since graduation, I've written about science for many publications including The Atlantic and Scientific American, and I'm currently at NPR's science desk. My connections with the Harvard OEB department continue to help me hunt down stories and write analytically about the world we live in.

FIFTH-YEAR GRADUATE STUDENT STANFORD BIOLOGY DEPARTMENT HANNAH FRANK '09

Concentrating in OEB/IB was one of my favorite parts of Harvard—my interactions with many wonderful professors, graduate students and other undergraduates in the field, the lab, the museum and the classroom is a large part of why I decided to go to graduate school and these people remain my mentors and colleagues today. In no other concentration would you watch birds feed while floating in the ocean off Mexico, spend an afternoon chasing down the reagents to remove shellac from a mastodon skull, write a term paper on the evolution of venom, or fall into quite so many mud puddles. You'll also be the most interesting person at cocktail parties (whether it's a reception during which the president of the College tells you that you "have to compare lizard catching tips with her [10 year old] son" or a concert during which a woman's only reaction to your dissertation work collecting bodily fluid samples from bats is "but you're so feminine!").

IB CONTACT

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HARVARD UNIVERSITY CENTER FOR THE ENVIRONMENT

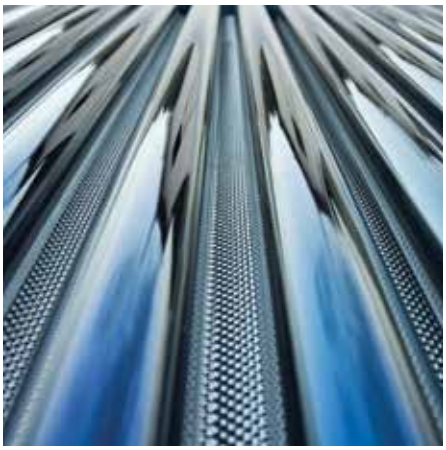
The Harvard University Center for the Environment (HUCE) encourages research and education about the environment and its many interactions with human society.

The Center draws its strength from faculty members and students across the University who make up a remarkable intellectual community of scholars, researchers, and teachers of diverse fields including chemistry, earth and planetary sciences, engineering and applied sciences, biology, public health and medicine, government, business, economics, religion, and law. The most pressing problems facing our natural environment are complex, often requiring collaborative investigation by scholars versed in different disciplines. By connecting scholars and practitioners from different disciplines, the Center for the Environment seeks to raise the quality of environmental research and teaching at Harvard and beyond.

Through a variety of grants and fellowships, the Center supports research related to the environment at every level, from undergraduates through senior faculty members. By sponsoring symposia, public lectures, and informal student convocations, the Center connects people with an interest in the environment.

SECONDARY FIELD IN ENERGY AND ENVIRONMENT

The Environmental Science and Public Policy Concentration, in coordination with HUCE, offers the Secondary Field in Energy and Environment (E&E) to increase Harvard students' exposure to, and literacy in, the interconnecting set of issues related to energy and the environment while maintaining their focus in their home concentrations. Through debate and dialogue in coursework and seminars, students will identify the obstacles, highlight the opportunities, and define the discussion for an energy-environment strategy for the 21st century and beyond.



Students from a wide range of concentrations, including the humanities, are invited to participate in the program to explore how different disciplinary perspectives on energy and environment intersect and inform one another. To learn more or apply, visit: www.espp.fas.harvard.edu/energy-environment.

HUCE LECTURE SERIES AND SPECIAL EVENTS

HUCE hosts a number of lecture series, symposia, conferences, and special events each academic year. To watch videos from past talks, visit www.environment.harvard.edu/huce-videos. To learn more about energy and environmental events at Harvard and the greater Boston area, visit: www.environment.harvard.edu/events/calendar/list.

FUNDING SOURCES

Undergraduate students can apply for the Undergraduate Summer Research Fund, which provides financial support for student research projects related to energy and the environment.

The fund supports two types of research experiences for students: independent research projects and research assistantships based on faculty-directed research. Award amounts are usually between $500-$3,000.

To learn more about funding sources, visit: www.environment.harvard.edu/student-resources/undergraduate-summer-research-fund.

ENVIRONMENTAL COURSE GUIDE

HUCE annually updates the Environmental Course Guide, a list of Harvard courses most relevant to energy and environmental studies. The Course Guide is searchable by keyword, school, research area, and semester. Visit www.environment.harvard.edu/student-resources/course-guide/courses to access the guide.

FACULTY ASSOCIATE DIRECTORY

Nearly 250 Harvard faculty from a variety of disciplines are affiliated with HUCE. As leading scholars in their fields, they provide expert knowledge on a number of energy and environmentally-related topics.

Faculty Associates represent these schools across the University:

- Faculty of Arts and Sciences
- Graduate School of Design
- Harvard Business School
- Harvard Divinity School
- Harvard Graduate School of Education
- Harvard John A. Paulson School of Engineering and Applied Sciences
- Harvard Kennedy School
- Harvard Law School
- Harvard Medical School
- Harvard T.H. Chan School of Public Health

The database of Faculty Associates, available on our website, is searchable alphabetically, by research area, school, department, and keyword: www.environment.harvard.edu/about/directory/faculty/

GET CONNECTED

Website: Stay connected to the Center's news and events at www.environment.harvard.edu

Newsletter: Published annually, *Environment@Harvard* details faculty and student environmental research. Want to join our mailing list? Sign up at the bottom of our website.

Events Calendar: Want to know what events are happening at Harvard and beyond? Subscribe to the Center's weekly events e-mail via the footer of our website.

Facebook: Visit the Harvard University Center for the Environment Facebook page to learn more about our upcoming events and special programs. "Like" our page today.

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Harvard University Center for the Environment

ENVIRONMENTAL STUDENT CLUBS & ORGANIZATIONS

CRIMSON BIKES
http://crimsonbikes.org

ENVIROED
http://www.hcs.harvard.edu/eed/

HARVARD COLLEGE BISEXUAL, GAY, LESBIAN, TRANSGENDER, QUEER, AND ALLIED STUDENTS IN THE SCIENCES
http://www.hcs.harvard.edu/~HBASIS/

HARVARD COLLEGE CONSERVATION SOCIETY
http://www.harvardconservation.org/about.html

HARVARD COLLEGE ENGINEERING SOCIETY
www.hcs.harvard.edu/~hces/

HARVARD COLLEGE GEOLOGICAL SOCIETY
http://www.facebook.com/harvardgeosoc

HARVARDD COLLEGE GLOBAL ENERGY INITIATIVE
http://harvardgei.com

HARVARD ENVIRONMENTAL ACTION COMMITTEE
http://www.hcs.harvard.edu/~eac/

HARVARD COLLEGE NATURALIST CLUB
https://harvardnaturalists.wordpress.com

HARVARD COUNCIL ON BUSINESS AND THE ENVIRONMENT
http://harvardcouncil.com/

HARVARD ENERGY AND ENVIRONMENT NETWORK (HEEN)
http://www.hcs.harvard.edu/heen/

HARVARD ENERGY JOURNAL CLUB
http://www.hcs.harvard.edu/hejc/

HARVARD MOUNTAINEERING CLUB
www.harvardmountaineering.org

HARVARD OEB UNDERGRADUATE GROUP
https://www.facebook.com/OEBug/

HARVARD OUTING CLUB
http://harvardoutingclub.org/

HARVARD SCIENCE REVIEW
http://harvardsciencereview.com/

HARVARD SOCIETY OF BLACK SCIENTISTS AND ENGINEERS
http://www.hcs.harvard.edu/hsbse/wp/

SCIENCE CLUB FOR GIRLS
http://www.hcs.harvard.edu/scfg/

UNDERGRADUATE RESOURCE EFFICIENCY PROGRAM
https://green.harvard.edu/programs/undergraduate-resource-efficiency-program

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