Class of 2022,

Welcome to the Freshman Seminar Program, one of Harvard College’s finest jewels.

Since its inception in 1959, our program has provided Harvard freshmen with delightful learning communities in which they work closely with faculty and peers on a topic of mutual interest.

The pages in this booklet describe in alphabetical order the 129 Freshman Seminars that will be offered in 2018–2019. As you will see, the range of seminars is spectacular: They offer you an exceptional introduction to every corner of the University, and they are taught by some of Harvard’s most distinguished faculty members. There is probably no finer way to explore new interests—or expand on existing passions—than by enrolling in a freshman seminar.

As the name suggests, you may only take freshman seminars during your freshman year, and, during that year, you may enroll in up to two seminars, one in each term. Demand for many of our seminars is very high. To maximize placement chances, we strongly recommend that you cast your net widely and apply to at least seven seminars that pique your curiosity.

As you embark on your journey through the College’s liberal arts curriculum, we urge you to take full advantage of the extraordinary opportunity presented by our freshman seminars. We promise you that it will be one of the highlights of your first-year experience.

Ofrit Liviatan
Director, Freshman Seminar Program
FRESHMAN SEMINAR PROGRAM

WHAT DO STUDENTS THINK?

My Freshman Seminar has allowed me to feel welcomed into the Harvard community; has showed me the great things I have to look forward to; and have stimulated intellectual growth.

I loved the [SAT/UNS] grading of the freshman seminar because I felt it freed up my class to take risks with our thinking. I feel like I worked harder for this class than all my others and produced my best quality work. This fosters learning for learning’s sake.

This class exemplified, for me, what I wanted my Harvard experience to be like: I worked closely with my peers and a leading professor to work through and think about important questions that have real-life implications. I think this will be one of the best courses I take at the university. I’ve taken two freshman seminars, and both were outstanding. It has been lovely to get to know high-profile professors who are so passionate about their fields.

The Freshman Seminar Program is amazingly unique, and I really appreciate the opportunity to look into something I wouldn’t have thought to study.
The greatest thing that I have gotten out of the experience has been with my professor. He and I still regularly meet and we keep in touch about his work and mine. He wrote recommendation letters for my summer research applications and has really been an excellent unexpected addition to my advising network.

LOVED IT! Taking a freshman seminar was the greatest thing I did this year. It was fascinating, educating, thought-provoking, de-stressful, and fun. My seminar was like a family. It was truly a highlight of my freshman year.

Applying for this seminar was my best decision since I’ve come to Harvard. Don’t worry if you’re not experienced—this class is meant for students with all levels of experience and you will catch up soon.

This was not only my favorite class this semester by far, but some of my best friends at college have come from this class. Every week is 2 hours of bonding [...] with various focus activities. The projects made me think, explore my range of emotions, and brought sides of me out that I swore I would never show anyone. I would take this class every semester if I could, I’ll remember it forever.

This is the quintessential freshman seminar class: It is taught by an outstanding professor in the field who is ridiculously passionate about the topic, in addition to being remarkably caring about each and every one of the students. The workload is manageable and engaging, and class trips are a ton of fun and give you the opportunity to explore resources on campus that you may not encounter otherwise.

The greatest thing that I have gotten out of the experience has been with my professor. He and I still regularly meet and we keep in touch about his work and mine. He wrote recommendation letters for my summer research applications and has really been an excellent unexpected addition to my advising network.”
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Screen shot from FSP video
(Production Values, Inc-2017)
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and urban planning

DIRECTOR’S LETTER:
Ofrit Liviatan (Alessandro Vaccaro)

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CREDIT
Freshman seminars are offered for credit and are normally taken as part of the regular program of four courses in each term of the year. Any student who enters Harvard as a freshman may apply to any freshman seminar during the first two terms of residence. A student may enroll in only one freshman seminar in a term, though it is possible to take one in each term if space is available. Seminars are not letter-graded: A student’s work in the seminar is evaluated as “Satisfactory” or “Unsatisfactory.” Students who neglect the work of the seminar or who do not perform satisfactorily will be excluded from the seminar and/or denied credit. Seminar instructors report in writing on each student’s performance in a seminar; these reports are available to the student through established procedures.

All seminars count toward degree credit. Some seminars may be counted toward concentration requirements or regarded as “related” courses in a field of concentration; this decision is made by the department or the committee of the concentration.

APPLICATION AND ADMISSION
Applications to the Freshman Seminar Program may be submitted electronically through a Web-based system starting on Friday, August 3, 2018. Information about applying to fall-term seminars is available on the Freshman Seminar Program website (www.freshmanseminars.college.harvard.edu) or from the Freshman Seminar Program Office (617-495-1523). Applications will be accepted until 3:00 pm on Tuesday, August 28, 2018, and students will be notified of their placement on Thursday, August 30, 2018. Applications for spring-term seminars may be submitted starting in December.

We urge students to apply to as many seminars as are of interest. Since applications to many seminars exceed the number of available slots, students are encouraged to apply to at least seven seminars in order to maximize chances of being placed in a seminar of choice. Admission to a seminar is determined by the instructor. Some seminar leaders set no prerequisites other than interest in the subject; other seminars, because of their specialized nature, require particular qualifications or appropriate academic background.
COURSE REGISTRATION IN MY.HARVARD

Please consult our website, www.freshmanseminars.college.harvard.edu, for up-to-date information on pertinent deadlines. All applicants are advised to plan a full program, to arrange sectioning, and to proceed as though they were not going to be accepted into a seminar. It is easier to drop out of a regular course after being notified of one’s acceptance into a seminar than it is to join a regular course one week late if one is not placed in a seminar. **You will be notified of your seminar placement before the course registration deadline and your placement will be added to your Crimson Cart in My.Harvard by the Registrar’s Office. If you add or change your seminar after this initial placement, you will need to add the seminar to your Crimson Cart and send a request to the instructor in My.Harvard for permission to enroll.**

For further information, please contact the Freshman Seminar Program Office:
6 Prescott Street, Harvard University, Cambridge, MA 02138
Email: seminars@fas.harvard.edu
Telephone: 617-495-1523
Website: www.freshmanseminars.college.harvard.edu

Students should check the Freshman Seminar Program website, the Yard Bulletin, and dormitory bulletin boards at the beginning of each term for additions and deletions to the Freshman Seminar Program.

**PLEASE NOTE:** The most up-to-date list of seminars and meeting times can be viewed on our website at www.freshmanseminars.college.harvard.edu.
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SEMINARS

THE AMAZING BRAIN
John E. Dowling (Department of Molecular and Cellular Biology and Harvard Medical School)

Freshman Seminar 22M  4 credits (spring term)  Enrollment: Limited to 15

Prerequisite: High school science.

Note: I invite especially those students who are not planning to concentrate in neurobiology or a natural science to join the seminar.

Clinical cases have told us much about human brain function. This seminar will examine some of the famous neurological cases, what we have learned from them, and explore brain mechanisms. Included will be Broca’s patient “Tan,” whose case led to the identification of one of the brain’s language areas; Phineas Gage, whose injury to a specific brain region changed his personality dramatically; and patient HM, who after brain surgery, no longer could remember things for more than a few minutes. We will expand on the cases by reading from my book Creating Mind, which is an introduction to brain and mind mechanisms in language accessible to anyone who has had elementary high school science. Many of the chapters describe other medical cases, not as well-known as the classic cases described above, but instructive nevertheless.

AMERICAN PRESIDENTIAL CAMPAIGNS AND ELECTIONS
1960–2016
Maxine Isaacs (Department of Government)

Freshman Seminar 41P  4 credits (fall term)  Enrollment: Limited to 15

For two hours each week, students will work to understand the history, forces and politics of American presidential campaigns and elections. Each student will be “responsible” for one presidential election between 1960 and 2016, and, together, members of the seminar will develop some perspective on dramatic changes as well as enduring factors that have shaped our own times, issues and society. With the help of some guests—practitioners including political leaders, public opinion analysts and journalists—students will develop a deeper understanding of contemporary politics, the impact of demographic patterns and changes, public opinion and polling, and political communication. Students will learn about the relationship among politics, news and public opinion, and who influences whom. Participants will be introduced to excellent contemporary studies about modern presidential campaigns and elections. At the end of the term, students will make oral reports to the class on lessons learned from a past election which can help all of us better understand this one.
AMERICANS AT WORK IN THE AGE OF ROBOTS AND ARTIFICIAL INTELLIGENCE
Benjamin M. Friedman (Department of Economics)

Freshman Seminar 71G  4 credits (fall term)  Enrollment: Limited to 12

Where will the coming generation of Americans (say, today’s 18-year-olds) find jobs? And will the jobs be worth having? People have worried about losing their jobs to technology at least since the Luddites 200 years ago. In the aggregate, they have been wrong. The automobile put lots of stable boys and saddle makers out of work, but it created vastly more jobs making cars, and fueling and repairing them, and it opened the way for whole new industries like roadside motels and restaurants. With robots increasingly performing the tasks once done by blue-collar labor, however, and computers and artificial intelligence now eliminating the need for many workers once thought to be immune because of their cognitive skills, today’s technological threat seems different. It is no longer just the unskilled and undereducated whose jobs are at risk. Moreover, the challenge may be especially acute in America, where wages are far higher than in many other countries and an ever-greater share of what we consume and invest not only can be provided from overseas but often is. Does the next generation of Americans, then, face a genuine threat from advancing workplace technology? If so, what are the dangers—not just economic, but social, political, even moral—to the country as a whole? Most important, what can we do about it?

AMERICA’S $3 TRILLION CHALLENGE: HEALTH CARE ACCESS AND PRODUCTIVITY IN THE HEALTH REFORM ERA
Alan M. Garber (Department of Economics, Harvard Medical School, Harvard Kennedy School, and Harvard T. H. Chan School of Public Health)

Freshman Seminar 40K  4 credits (spring term)  Enrollment: Limited to 15

Prerequisites: Background in microeconomics at the level of first-semester Economics 10 is required. Knowledge of AP-level statistics is desirable. The seminar is relevant to anyone with an interest in applied economics, public policy, health care, or public health.

“Why does health care cost so much?” Policymakers, employers, and the public share deep frustration at high health expenditures, which are blamed for rising federal deficits, the declining competitiveness of U.S. businesses, and the risk of financial ruin for individuals unfortunate enough to suffer a costly illness or injury. Unless health expenditures can be controlled, universal access to care is likely to remain an unattainable goal in the United States. In this seminar, we will explore the causes and consequences of the high costs of care and the range of approaches to increasing the productivity of health care. The Affordable Care Act and alternative health reform options will be critically examined for their effects on health care productivity. Students will be exposed to techniques for measuring the effectiveness and value of health care, and will become familiar with economic and clinical studies. Students will be asked to produce a mid-term outline and final paper on solutions for improving health care productivity in the U.S.
ANCIENT EAST ASIA: CONTESTED ARCHAEOLOGIES OF CHINA, KOREA AND JAPAN
Rowan K. Flad (Department of Anthropology)

Freshman Seminar 70L 4 credits (fall term)  Enrollment: Limited to 12

How is our understanding of the past determined or framed by the concerns of the present? This seminar considers this problem with a focus on East Asia. In the process, we learn about the origins of the people, cultures, and civilizations of East Asia, but we don’t focus simply on the apparent facts of historic reconstruction. Instead, we consider how the varied and complicated histories and relationships among people and societies in the modern nation-states of China, Korea, Japan and other nearby countries are understood through archaeological practice in the present. This class explores those origins, and focuses on controversies that show the stakes of archaeological interpretation to political and social discourse in the modern world. We will discuss fundamental questions in the prehistory and early history of East Asia through the lens of archaeological discoveries, including human origins, the origins of agriculture, how stratified, complex societies emerged, early processes of globalization and connections across Eurasia, conflicts between centers and peripheries, connections between China, Korea and Japan in prehistory, Buddhist origins, and more. How are the “origins” in these modern countries similar or different? How are they related? Are they controversial? We will explore controversies that have emerged in recent East Asian archaeological research and discuss why archaeological topics are subject to controversial interpretation and what is at stake in the disagreements. These examples illustrate the significance of ancient cultural material in the modern world and what is at stake in debates over who owns the past. Why should we, situated at Harvard, care about the Asian past? How is this connected to modern Asian identity, and does this relate to Asian-American identity? Seminar participants will produce a digital exhibit that will engage in the reflective production of knowledge about Ancient East Asia by examining some aspect of the archaeological record of the East Asian past.
THE ART AND CRAFT OF ACTING
Remo F. Airaldi (Committee on Theater, Dance, and Media)

Freshman Seminar 35N  4 credits (fall term)  Enrollment: Limited to 12

Note: Students will be required to attend theater performances during the course of the term. There will be no charge to the student.

We’ve all watched a great performance and wondered, “How did that actor do that?” Acting is undoubtedly the most popular, most widely experienced of the performing arts and yet, in many ways, it remains a mystery. This seminar will give students an opportunity to demystify the art of acting by introducing them to the basic tools of the trade; they will learn about the craft of acting by actually “doing” it. It will provide an introduction to acting by combining elements of a discussion seminar with exercises, improvisations and performance activities. Improvisation will be used to improve group/ensemble dynamics, to minimize habitual behaviors, and to develop characters. Students will explore a range of acting techniques designed to give students greater access to their creativity, imagination and emotional life. The aim will be to improve skills that are essential to the acting process, like concentration, focus, relaxation, observation, listening, etc. In the later part of the term students will work on monologues. Students will also attend and critique productions at the Loeb Drama Center and other theaters in the Boston area.

ARTIFICIAL AND NATURAL INTELLIGENCE
Venkatesh N. Murthy (Department of Molecular and Cellular Biology)

Freshman Seminar 50F  4 credits (spring term)  Enrollment: Limited to 12

Recommended Prep: This seminar targets students that are interested in brains and computers in equal measure, and are comfortable with analytical thinking. Some basic programming skills in Python, Matlab or equivalent is required to complete assignments—you will receive help with a remedial programming boot camp in the first two weeks.

What is intelligence? An inquiry into the nature of intelligence can take different forms—philosophical, biological, mathematical or technological. In this Freshman Seminar, we will use machine intelligence (everything from voice recognizing smartphones to Jeopardy-playing computers) as a handle to think about natural intelligence (brains and behavior of animals). Although we will start with big, general questions, we will quickly move to concrete queries about brains and computers. This approach, rather than just starting with brains of animals, may be useful in framing more universal questions independent of the specific architecture of brains of animals.
ASIAN AMERICA

Diana L. Eck (Department of South Asian Studies and Committee on the Study of Religion)

Freshman Seminar 70Y 4 credits (fall term)  Enrollment: Limited to 12

Note: There will be several required field trips—visits to the Sri Lakshmi Hindu Temple and the Raynham Thai Temple, an optional Tea Ceremony at the Tea House of the Harvard-Radcliffe Chado Society, the Ramakrishna Vedanta Society, and the Medford Gurdwara.

How “Asian” is America today? This seminar explores the Asian dimensions of American history, immigration, religion, and culture from the first encounters of Thoreau and Emerson with texts and ideas of the “Orient” to the saturation of modern America with the holistic cultures of yoga, tai chi, and mind-body medicine. We will also look at the Asian communities from India, China, Korea, and Japan that brought new forms of religious and cultural life to the U.S. in the twentieth century.

ASTERIODS AND COMETS

Charles R. Alcock (Department of Astronomy)

Freshman Seminar 23R 4 credits (spring term)  Enrollment: Limited to 12

Prerequisite: AP calculus or equivalent.

Note: The seminar will make use of the Clay Telescope on the roof of the Science Center. There may also be a trip to the Observatory at 60 Garden Street to visit the Great Refractor.

Comets have been seen regularly since before the beginning of recorded history. They have often been regarded as disturbing portents. Asteroids, on the other hand, were not discovered until the nineteenth century, with the advent of astronomy with telescopes. Today we know of many more asteroids than comets, but we believe that there are vastly more comets than asteroids in the solar system. This seminar will start with the history of the study of comets and asteroids, including the “Great March Comet of 1843,” observations of which led to the establishment of the Harvard College Observatory and its Great Refractor, at that time the largest telescope in the Americas. Our understanding of comets advanced dramatically in 1950 with the publication of two extraordinary papers: Whipple (then at Harvard) described the mixture of dust and ice that comprises the nuclei of comets, and Oort (Leiden University) showed that new comets enter the inner solar system from a vast, diffuse cloud surrounding the planetary system. Today, modern telescopes and spacecraft encounters provide us with a wealth of information about comets and asteroids. We will examine these observations and learn what is known and what is inferred about the origin and structure of asteroids and comets. Students will observe with the Astronomy Laboratory’s Clay Telescope on the roof of the Science Center. Students will take on projects that may involve their own observing program, or that exploit existing data.
AUTOBIOGRAPHY AND BLACK FREEDOM STRUGGLES  
Tommie Shelby (Department of African and African American Studies and of Philosophy)  

Freshman Seminar 32R  4 credits (fall term)  Enrollment: Limited to 12

This seminar introduces the main traditions of African American political thought and the history of the black fight for justice through the genre of autobiography. Students will read some classic autobiographies by African Americans (for example, those by Frederick Douglass, Booker T. Washington, and Malcolm X), along with some lesser-known works (for instance, autobiographies by Ida B. Wells, Shirley Chisholm, and Amiri Baraka). They will discover how an influential set of black individuals, both men and women, came to political consciousness and participated in the collective struggle for justice in America. Students will reflect on these figures’ personal struggles to find meaning and solace under unjust conditions and to forge dignified modes of resistance. The seminar provides an opportunity to see how these personalities interpreted key events and periods in U.S. history—slavery, the Civil War, Reconstruction, the Jim Crow era, the two World Wars, the Great Depression, the civil rights movement, and the post-industrial urban crisis—as social actors who participated and lived through them. Close attention will be paid to their engagement with and contributions to the political traditions of liberalism, conservatism, socialism, black nationalism, and feminism. And students will critically examine how these influential thinkers and activists understood ideals like freedom, equality, democracy, fairness, and tolerance.

BEACHHEAD FOR RADICALISM OR BASTION OF THE ELITE ESTABLISHMENT? POLITICS AND THE HISTORY OF AMERICAN HIGHER EDUCATION  
Julie A. Reuben (Harvard Graduate School of Education)  

Freshman Seminar 70R  4 credits (fall term)  Enrollment: Limited to 15

When colleges and universities are in the news, it’s often related to politics. Headlines feature students who shout down controversial speakers or professors who only present liberal ideas in their classrooms or universities that fire professors whose tweets anger donors. The public is interested in these stories because the stakes are high. Colleges and universities teach the people who are going to be the next generation of leaders. What if those people are indoctrinated with bad ideas or are not taught to how to behave in a democracy? Faculty members are the country’s experts. What if they do not provide reliable information? As experts, should their views count more those of average citizens? Colleges and universities are supported with tax dollars, private donations and tuition payments. Who are they accountable to? The debate about higher education and politics polarizes quickly. Conservatives accuse higher education of radicalism and progressives accuse it of supporting the elite power structure. But the reality is more complex.
We will explore the complexity of universities’ relation to politics by studying historical periods of intense political conflict, such as times of war or periods of political activism, like the abolitionist movement or the civil rights movement. These historical cases will help us think more clearly about the present, another period of political strife affecting American higher education. In addition to examining how these political conflicts intersected with higher education nationally, we will conduct original research on their impact at Harvard. The class will meet in the Harvard University Archives where we will have access to a wealth of primary sources including students’ diaries, course materials, administrative records, professors’ correspondence and materials produced by student organizations. Every week we will delve into sources related to the topic under consideration and over the course of the semester, students will undertake increasingly complex research projects of their own design.

**BEAUTY AND CHRISTIANITY**

Robert J. Kiely (Department of English)

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<th>Freshman Seminar 31N</th>
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In Book X of *The Confessions* Augustine wrote, “I have learned to love you late, Beauty at once so ancient and so new!” In addressing God as source and model of beauty, Augustine joins theology and aesthetics in one sentiment that has informed and, sometimes, troubled Christianity throughout its history. There is no doubt that the life and teachings of Jesus have inspired some of the greatest works of art, literature, and music in Western culture, but it is also true that Christians have not always agreed on the definition and function of beauty. The seminar will consider certain key Christian aesthetic theories, including those of Augustine, Gregory the Great, Aquinas, and Calvin. But the focus will be on the analysis of particular works: selections from Dante’s *Paradiso*, the poems of Herbert, Donne, and G.M. Hopkins, *The Little Flowers of St. Francis*, Bunyan’s *Pilgrim’s Progress*, Hawthorne’s *Scarlet Letter*, Melville’s *Billy Budd*, works of C.S. Lewis, and the short stories of Flannery O’Connor. Included as well will be paintings (e.g., Italian Renaissance depictions of Jesus, Mary, Mary Magdalene, John the Baptist, and St. Sebastian) and choral music (e.g., Bach’s *Saint Mathew Passion* and selected African American spirituals). The abiding question will be: In what ways does aesthetic form—beauty—enhance, qualify, complicate, or obscure the gospel?

It’s always wonderful to learn how students take the classroom into real life and there is no greater satisfaction for a teacher than to know that a class one has taught has had a beneficial or stimulating impact. [It is] one of the many great strengths and benefits of the Freshman Seminar Program.
BIO-INSPIRATION AND INNOVATION
Joanna Aizenberg (Harvard John A. Paulson School of Engineering and Applied Sciences)

Freshman Seminar 50U 4 credits (fall term)  Enrollment: Limited to 12

Note: Background in natural sciences is preferred, but not required; students in social sciences and humanities are welcome: just be bio-inspired!

In the course of evolution, nature has developed strategies that endow biological processes and materials with exquisite selectivity, specificity, and adaptability to a constantly changing environment. Learning from and mastering nature’s concepts not only satisfies humankind’s insatiable curiosity for understanding the world around us, but also promises to drive a paradigm shift in modern materials science and technology. This seminar will explore some of the basic principles of biological architectures and the economy with which biology solves complex problems in the design of novel materials. It will give us a taste of how the inspiration from nature teaches us to break barriers in technology and disruptively innovate. Often nature’s solutions to engineering problems are so different from our conventional ways of thinking that the most fruitful way to investigate them is not immediately obvious. We will be therefore engaged in a continuous dialogue: we study the biological material itself to begin to understand its underlying principles, adapt these concepts to design a bio-inspired architecture, and then apply insights from the designed system to guide further investigation of the biological system. The goal is to use biological principles as guidance in developing new, bio-inspired materials and devices, with broad implications in fields ranging from architecture to energy efficiency to medicine.

THE BIOLOGY AND SCIENCE OF CANCER AND ITS TREATMENTS:
FROM EMPIRIC TO SCIENTIFIC TO HUMANISTIC
George D. Demetri (Harvard Medical School)

Freshman Seminar 26W 4 credits (spring term)  Enrollment: Limited to 12

“Cancer” represents hundreds of different diseases with a wide variety of causative mechanisms, as well as enormous social impact. This seminar aims to provide an introduction to the biology of cancer and what makes a normal cell become a cancerous one, delving into acquired and inherited genetic abnormalities and effects of environmental factors, such as nutrition, radiation, and tobacco. Current approaches to cancer will be discussed, from prevention and early detection to treatment and survivorship. Treatment modalities continue to evolve—no longer just surgery, chemotherapy and radiotherapy, but development of targeted therapies such as monoclonal antibodies, signal transduction inhibitors, vaccines, and angiogenesis inhibitors, which are rationally aimed at biological mechanisms uniquely important to the cancer cells themselves with the goal of reducing side effects of therapy and improving outcomes. Although
cancer incidence continues to increase, mortality is decreasing, resulting in many more cancer survivors and a need to care for the secondary effects of the treatment and the societal impact of this disease. We will discuss the field of Integrative Oncology, an evolving discipline that treats the patient as a whole and combines the best of Eastern and Western medicine. As successful cancer management becomes more targeted with the newer therapies, there needs to be an integrative approach which focuses on clinical outcomes for patients and personalized approaches to individual cancers, yet which takes into account the financial impact of new therapies at a global level and allows development of wise public policy decisions.

THE BIOLOGY OF MOVEMENT
Andrew A. Biewener (Department of Organismic and Evolutionary Biology)

Freshman Seminar 50H 4 credits (spring term)  Enrollment: Limited to 12

Movement is a fundamental property of life that underlies many biological functions, ranging from collecting or catching food, predator escape, dispersal of offspring, mating and reproduction, to migration, social interaction, sport, and artistic expression. This seminar will explore why and how organisms move, providing an overview of the biological motors animals and microbes use to power movement, and mechanisms plant use for growth and geo-/photo-taxis. The seminar will survey historical photographic and modern filming approaches, examine how movement is depicted in art and evoked in dance, how movement shapes perception and cognitive interpretation, and how and why movement plays a central role in health and disease. The broader relevance of movement to the humanities and social sciences will therefore be examined. Students will be introduced to a variety of filming methods, allowing them to explore how movement is studied, and will learn how to quantify movement patterns to inquire and gain insight into their functional significance. Students will actively participate by video-recording observed movements of interest, and exploring their functional relevance to terrestrial locomotion, swimming, flying, dance, athletics, and cognition as well as plant movement. This seminar will include field trips to Harvard museums and libraries, a dance studio and the Concord Field Station. Students will read general articles and share weekly video-recordings throughout the term. Students will complete a seminar project based on a video-kinematic analysis of movement highlighting its biological, social and/or artistic significance, or by writing a final paper that examines in-depth some aspect of the biology of movement.

The course was a great introduction to academics at Harvard. I really enjoyed […] the way class discussions reached beyond the text. There was often an emphasis on connecting the ideas to our own lives, which made the seminar very different from other courses here. […]
BIOLGY OF SYMBIOSIS: LIVING TOGETHER CAN BE FUN
Colleen M. Cavanaugh (Department of Organismic and Evolutionary Biology)

Freshman Seminar 24Q 4 credits (fall term)  Enrollment: Limited to 12

Note: The seminar will occasionally meet longer for field trips or other projects, dates TBD.

This seminar examines the remarkable diversity of symbiotic associations on Earth, their ecology and evolution, and their roles in human health and disease, agriculture, and biotechnology. Symbioses—“living together”—with microbes are ubiquitous in nature, ranging from lichens to the human microbiome. Symbiosis drives evolution, resulting in “new organisms” and charges us to think about biodiversity on a new level. They affect the ecologies of organisms, e.g., by allowing colonization of otherwise hostile environments such as deep-sea hydrothermal vents.

In agriculture and natural environments, symbioses “self-fertilize” plants in nitrogen poor soils. In medicine, they impact understanding of emerging diseases, as pathogens are at one extreme of the symbiotic continuum. Knowledge of such partnerships is critical to understanding all life on Earth. Our own cells are host to intracellular symbionts, i.e., mitochondria, which evolved from free-living bacteria 1–2 billion years ago. Further, the Human Microbiome Project emphasizes that ‘we are not alone.’ Humans harbor 10X more bacteria than human cells, a consortium integral to host health and development. Indeed, recent studies reveal multiple benefits ranging from protection against pathogens, to development of the immune system. In this freshman seminar, microbial symbioses with animals, plants, fungi, and protists will be discussed, complemented by firsthand observations via microscopy and field trips to local environs including Boston Harbor Islands, the New England Aquarium, and your own microbiome.

BLACK HOLES, STRING THEORY AND THE FUNDAMENTAL LAWS OF NATURE
Andrew E. Strominger (Department of Physics)

Freshman Seminar 21V 4 credits (fall term)  Enrollment: Limited to 12

Prerequisites: High school level calculus and physics. Non-scientists are welcome.

The quest to understand the fundamental laws of nature has been ongoing for centuries. This seminar will assess the current status of this quest. In the first five weeks we will cover the basic pillars of our understanding: Einstein’s theory of general relativity, quantum mechanics and the Standard Model of particle physics. We will then examine the inadequacies and inconsistencies in our current picture, including, for example, the problem of quantum gravity, the lack of a unified theory of forces, Dirac’s large numbers problem, the cosmological constant problem, Hawking’s black hole information paradox, and the absence of a theory for the origin of the universe. Attempts to address these issues and move beyond our current understanding involve a network of intertwined investigations in string theory, M-theory, inflation and non-abelian gauge theories and have drawn inspiration from the study of black holes and developments in modern mathematics. These forays beyond the edge of our current knowledge will be reviewed and assessed. The format of the seminar will be discussion of weekly reading assignments, and a final paper.
BORGES, GARCÍA MÁRQUEZ, BOLAÑO AND OTHER CLASSICS OF MODERN LATIN AMERICAN FICTION AND POETRY
Mariano Siskind (Department of Romance Languages and Literatures and of Comparative Literatures)

Freshman Seminar 33C  4 credits (fall term)  Enrollment: Limited to 12

*Note:* All readings and discussion will be in English.

This seminar introduces students to some of the most important Latin American literary works produced during the twentieth century. We will explore the ways in which these novels, short-stories and poems interrogate the historical traumas, political contexts and aesthetic potential of the region between 1920s and 1980s. We will shed light on their place in the historical and cultural formation of the literary canon, as well as on the concept of ‘classic.’ The goal of this seminar is two-fold. On the one hand, it introduces students to the Latin American literary and critical tradition through some of the best and most interesting literary and critical works (each novel or grouping of short stories and poems are paired with an important critical essay that situates them historically and aesthetically). On the other, it provides them with the fundamental skills of literary analysis (close reading, conceptual and historical framing, continuities and discontinuities with the aesthetic tradition). We read Jorge Luis Borges, Juan Rulfo, Gabriel García Márquez, Alejandra Pizarnik, Juan José Saer and Roberto Bolaño.

CAN ART INSPIRE SOCIAL JUSTICE?
Sarah E. Lewis (Department of History of Art and Architecture and of African and African American Studies)

Freshman Seminar 62M  4 credits (spring term)  Enrollment: Limited to 15

*Note:* There will be a required trip to New York City to visit artist studios and museum and gallery exhibitions.

How do images—photographs, films, and videos—create narratives that shape our definition of national belonging? Social media has changed how we ingest images. Protests, social injustice, and collective moments of triumph are all played out in photos and videos in real time unlike anything we thought possible just a few decades ago. What skills of visual literacy and critical consciousness are required to understand of the opportunities and challenges that technology is presenting to civic life? The seminar will explore the connection between images and justice in America, focusing on case studies that deal with historic and contemporary topics from emancipation, indigenous conflict, desegregation, Japanese internment, borderland conflicts, the long Civil Rights movement, and more. It will wrestle with the question of how the foundational right to representation in a democracy, the right to be recognized justly, is indelibly tied to the work of images in the public realm. What constitutes a figurative emblem of protest? What does effective resistance look like in art and in the digital realm? By the end of the seminar, students should be able to consider how images have had persuasive efficacy in the context of social and racial justice movements, critically engage with and contextualize the narratives surrounding images posted online, and understand how democratic rights are connected to visual representation in the United States.
CAN DEMOCRACY BE SAVED?
Daniel F. Ziblatt (Department of Government)

Freshman Seminar 71L 4 credits (fall term)  Enrollment: Limited to 12

Around the globe, democracy is increasingly embattled. From Hungary, Venezuela and Turkey to Western Europe and the United States, there is growing perception that democracy itself faces a series of unprecedented challenges. Norm-breaking insurgents confront declining mainstream parties. Once in power, elected leaders with authoritarian inclinations often entrench themselves in power. Voters seem increasingly susceptible to “fake news.” Economic inequality makes democracy vulnerable to “capture” by powerful economic interests. And intense party polarization sometimes leaves voters blind to abuses of elected autocrats. Can democracy be saved? This seminar explores the concept of democracy and some chronic problems in the practice of democracy to trace the history of the idea, exploring whether the supposedly self-correcting logic of democracy is broken today. We explore how voters and political parties are thought to behave according to democratic theory. And we then explore how the three challenges of “fake news,” “economic inequality,” and “polarization” may make democracy more fragile than it has been in the past. We explore significant historical and contemporary cases of democratic breakdown to try discern lessons for our own democracy as it confronts these challenges.

THE CAUSES AND CONSEQUENCES OF INEQUALITY
David J. Deming (Harvard Kennedy School and Harvard Graduate School of Education)

Freshman Seminar 71N 4 credits (fall term)  Enrollment: Limited to 12

Why has earnings inequality in the U.S. and other developed countries increased so much since the 1970s? What are the consequences of rising inequality, and what can we do about it? This seminar provides an overview of what social science has to say about the causes and consequences of inequality, and engages students in a critical and balanced discussion of the positive and normative issues concerning rising inequality. Example topics include: 1) the key role of education and skills in rising inequality among the “99 percent,” 2) rising wealth inequality and taxation, 3) segregation, racial discrimination and the criminal justice system, 4) globalization and international trade, 5) elite capture of the political system, mass media and “big money” in politics. The goal of the seminar is to introduce analytical and moral frameworks for thinking about inequality, and to relate those frameworks to specific political and policy trade-offs in the U.S. and around the world.

It is rare beyond belief to receive the opportunity to sit beside one of the nation’s foremost experts [...]. Class discussions are meaningful and enlightening. Learning from your peers in this seminar really highlights the point that a Harvard education is much more than lectures or sections. I would most definitely encourage future students to apply.
**CHANGING OUR MIND: EVOLVING THOUGHTS ON BRAIN REGENERATION**

Paola Arlotta (Department of Stem Cell and Regenerative Biology)

| Freshman Seminar 26O | 4 credits (fall term) | Enrollment: Limited to 12 |

This freshman seminar will discuss current views and theories on brain regeneration in a dynamic setting that combines brainstorming of the literature with experimental, hands-on experience in the laboratory. Students will become familiar with classic, paradigm-changing experiments that have shaped the way we think about brain repair and also consider the newest theories on cellular reprogramming as a way to regenerate the nervous system. The seminar will include two visits to the research laboratory, where students will use different animal models to investigate, first-hand, the distinct regenerative capabilities of each organism. Experimental results will be used as a starting point to consider, contrast and evaluate how regenerative capacities have changed during evolution and to brainstorm paths forward towards new solutions for brain regeneration in species, like humans, that have not mastered this art. Emphasis will be placed on allowing students to creatively think about key scientific questions and to “feel” the excitement of scientific discovery in this fast changing field.

**CHILD HEALTH IN AMERICA**

Judith S. Palfrey (Harvard T. H. Chan School of Public Health) and Sean Palfrey

| Freshman Seminar 24N | 4 credits (fall term) | Enrollment: Limited to 12 |

How can American health care be improved for children? How a nation cares for its children’s health is often considered a measure of its commitment to the general citizenry and to its future. The members of the seminar will review together the history of children’s health and health care in the United States, exploring the impact of geography, environment, nutrition, clean water, as well as of the scientific discoveries of the late nineteenth century and the early twentieth century and the emergence of the high technology care of the middle and late twentieth century. Then they will pose the question, “Does America provide children and youth the best possible health care available in the twenty-first century?” To approach this question, students will analyze the current causes of illness, disability and death among U.S. children and youth and compare United States epidemiology with that of other developed and developing nations. Students will also explore how child health delivery is financed.
CHRISTIANITY AND SLAVERY IN AMERICA, 1619–1865: A
STUDENT-CURATED LIBRARY EXHIBIT
Catherine A. Brekus (Harvard Divinity School)

Freshman Seminar 43D  4 credits (fall term)  Enrollment: Limited to 12

Most people today assume that Christianity and slavery are incompatible. For most of Christian history, however, the opposite was true. Christians not only owned slaves, but they also argued that slavery was sanctioned by the Bible. This seminar will explore the relationship between Christianity and slavery in America from 1619, when the first slaves arrived in Virginia, to the Emancipation Proclamation in 1865. We will ask several questions. What was the role of Christianity in sanctioning slavery? How did white Christians become convinced that slavery was sinful? Why did many slaves convert to Christianity, the religion of their oppressors? How did enslaved Christians make sense of their suffering? The main work of the seminar will involve curating an exhibit on Christianity and slavery in America at the Andover-Harvard Theological Library. With the help of library staff, we will choose documents and objects for the exhibit, write captions, and organize the exhibit cases. The exhibit will open in early December and will remain on display for the rest of the academic year. Class meetings will take place each week in the Special Collections department of Andover-Harvard Theological Library, where we will read and discuss rare books and manuscripts, including proslavery tracts and sermons, abolitionist speeches, poems, and the personal religious narratives of enslaved men and women.

THE CITY OF TOMORROW: CONSTRUCTING AND INHABITING
THE 21ST CENTURY
Arthur I. Segel (Harvard Business School)

Freshman Seminar 70P  4 credits (spring term)  Enrollment: Limited to 12

Note: As part of this dual process of investigation and application, students will have the opportunity to meet with world-renowned architects, urban planners, and developers, while also taking excursions into Cambridge and Boston.

The built environment has profound effects on both our daily lives and the human condition at large. It determines where and how we live, work, play, and dream. The built environment embodies concrete stances on a wide variety of material, spatial, and cultural issues within a society. The quality and availability of affordable housing, for instance, is not merely an economic concern, but also a value judgment about the obligations of a society to its citizens. Underlying the practical aspects of the built environment—can this be built?—are cultural and societal considerations. By examining these issues on a variety of scales, ranging from the single-family home to the megacity, this seminar investigates how the built environment is the fingerprint of societal values and how it can be a vehicle for both positive and negative change. This seminar weaves together the practical aspects and social factors that make up the built environment. Each week, students will take on the role of decision-makers and engage with a wide variety of ethical, aesthetic, political, environmental, and social considerations. We will discuss how issues such as climate change, rapid urbanization, resource scarcity, economic inequality, and geopolitical conflicts, affect us as both inhabitants and constructors of the built environment. At the end of the seminar, students will bring together both ideological and practical considerations to design a new city from scratch à la Sim City.
CLIMATE CHANGE ECONOMICS: ANALYSIS AND DECISIONS
Martin L. Weitzman (Department of Economics)

Freshman Seminar 70E  4 credits (spring term)  Enrollment: Limited to 12

Prerequisite: Economics 10a or equivalent.
Climate change is one of the most difficult problems facing humanity. A small sample of questions to be asked and answers attempted in this seminar includes the following: How do we analyze and decide what to “do” about climate change? What are the basic “models” combining economics with climate science, what are these models telling us, and how do we choose among their varying messages? How are risk and uncertainty incorporated? How do we estimate future costs of carbon-light technologies? How do we quantify damages, including ecosystem damages? Who pays for what? Why are discounting and the choice of discount rate so critical to the analysis and what discount rate should we use? What is the “social cost of carbon” and how is it used? Which instruments (prices, quantities, standards, etc.) are available to control greenhouse gas emissions and what are the strengths and weaknesses of each? What is “climate sensitivity” and why is it, and the feedbacks it incorporates, so important? How should the possibility of catastrophic climate change be evaluated and incorporated? What are the costs and benefits of geoengineering the planet to counter global warming? Why has climate change been characterized as “the biggest international market failure of all time” and how might the world resolve the associated free-rider problem?

COMPARATIVE HISTORICAL MYTHOLOGY
Michael E. J. Witzel (Department of South Asian Studies)

Freshman Seminar 36S  4 credits (fall term)  Enrollment: Limited to 12

This seminar will deal with an innovative approach to comparative mythology, detailed in my 700 pp. book on the topic (OUP, Dec. 2012). Comparative mythology has been a well-trodden but controversial field since at least 1800. The proposed seminar will discuss the matter in a new way by incorporating an historical approach, which has so far been lacking. The two most prominent explanations for the wide-spread, worldwide similarities in myths have been archetypes (C.G. Jung) and diffusion (L. Frobenius / H. Baumann). Both approaches are inadequate to explain these similarities. By approaching myths historically, and working backwards from our earliest written sources (Egypt, Mesopotamia, Levant, India, China, Maya, etc.), earlier stages in the development of mythologies can be detected through successive reconstructions. These are supported by the additional testimony of oral texts found across the globe. Further, recent developments in human population genetics as well as in archaeology, anthropology and comparative linguistics sustain the proposed historical model, which ultimately, but rather tentatively, reaches back to the time of the “African Eve.” This seminar will investigate the ways myths have been compared in the past, and further, the underlying assumptions about human spirituality and religion, as well as available scientific evidence for such models. The new historical and comparative proposal will be tested against this evidence. All of this offers a wide scope for students’ class room intervention and individual research in a multitude of ancient and oral texts (in translations) from a variety of languages as well as in the sciences.
COMPLEXITY IN WORKS OF ART: ULYSSES AND HAMLET
Philip J. Fisher (Department of English)

**Freshman Seminar 33X** 4 credits (fall term)  **Enrollment: Limited to 12**

Note: There will be interviews for selected applicants. The instructor will contact selected applicants by email to schedule the interview during Opening Days week.

Is the complexity, the imperfection, the difficulty of interpretation, the unresolved meaning found in certain great and lasting works of literary art a result of technical experimentation? Or is the source extreme complexity—psychological, metaphysical, or spiritual? Does it result from limits within language, or from language’s fit to thought and perception? Do the inherited forms found in literature permit only certain variations within experience to reach lucidity? Is there a distinction in literature between what can be said and what can be read? The members of the seminar will investigate the limits literature faces in giving an account of mind, everyday experience, thought, memory, full character, and situation in time. The seminar will make use of a classic case of difficulty, Shakespeare’s *Hamlet*, and a modern work of unusual complexity and resistance to both interpretation and to simple comfortable reading, Joyce’s *Ulysses*. Reading in exhaustive depth these two works will suggest the range of meanings for terms like complexity, resistance, openness of meaning, and experimentation within form.

CONTEMPORARY ISSUES IN AMERICAN HIGHER EDUCATION
Robert W. Iuliano (Department of Government)

**Freshman Seminar 70W** 4 credits (spring term)  **Enrollment: Limited to 12**

Issues fundamental to society regularly play out on the campuses of America’s colleges and universities. For example, how should a community react to speech that some members may find offensive? To symbols or traditions that speak to the institution’s past but may be alienating to parts of its current student body? Is a college or university justified in considering race in admissions, or is that unfair discrimination? Should institutions invest their endowments to serve specific public policy goals, such as divestment from fossil fuel companies as a statement about climate change, or does that convert them into political actors inconsistent with their mission and obligation to create vibrant space for academic discourse? As you join the Harvard academic community, this seminar is designed to orient you to higher education and issues that often arise on and about college and university campuses. We will look at topics normatively, asking less what the rules are and more what they ought to be.

The seminar’s ultimate goal is to introduce you to the nature and values of the peculiar institutions that are America’s college and universities and to begin to help you understand more fully the world that will help shape your lives over the next four years.

[It’s] the idea of being able to take an intellectual risk, dive into something that you may have only a passing curiosity about but perhaps discovering something that you really enjoy!
CRISPR, GENOME EDITING, AND THE FUTURE OF MEDICINE
David R. Liu (Department of Chemistry and Chemical Biology)

Freshman Seminar 50Z  4 credits (fall term)  Enrollment: Limited to 12

Prerequisites: High school chemistry and biology knowledge.

Note: The seminar will be held at the Broad Institute in Cambridge. Participants will be provided with a pre-paid Charlie Card for travel by MBTA. There will be a required trip to a state-of-the-art genome editing laboratory.

The life sciences are undergoing a revolution stimulated by breakthrough advances in genome editing technologies. These technologies, including CRISPR, enable researchers and physicians to modify target DNA sequences in the genomes of living cells, including human cells and human embryos. The goal of this seminar is to equip participants with an understanding of the genome editing revolution that will inform their lives inside or outside of science. During the early part of the semester, students will learn how these remarkable agents were discovered and how they work. We will also discuss their current limitations, their potential to shape medicine, and some social and ethical implications of their use. Students will analyze recent reports from both the scientific literature and from popular media, and will present their analyses and opinions during the semester. Participants will also visit a state-of-the-art genome editing laboratory during the semester, and will develop and propose “think pieces” on an aspect of genome editing to the class at the end of the semester.

DEATH AND IMMORTALITY
Cheryl K. Chen (Department of Philosophy)

Freshman Seminar 30Q  4 credits (fall term)  Enrollment: Limited to 15

In this seminar, we will discuss philosophical questions about death and immortality. What is death? Is there a moral difference between “brain death” and the irreversible loss of consciousness? Is the classification of a person as dead a moral judgment, or is it an entirely scientific matter? Is death a misfortune to the person who dies? How can death be a misfortune if you are no longer around to experience that misfortune? Is it possible to survive after death? What does it mean for you to survive after your death? Is there such a thing as an immaterial soul distinct from your body? Is immortality something you should want in the first place? Even if you do not live forever, is it nevertheless important that humanity continues to exist after your death? By discussing these questions about death, we will hopefully gain insight about the importance and meaning of life.
DICKEY AND AMERICA
Leah Price (Department of English) & Jill M. Lepore (Department of History)

Freshman Seminar 62H  4 credits (spring term)  Enrollment: Limited to 12

Note: Attendance will be mandatory at two sessions that meet outside of our regular class time: a day-long trip to Lowell, by train and boat and an evening screening and discussion of Martin Chuzzlewit.

What happened when Britain's most celebrated novelist visited the world's most celebrated experiment in democracy? This seminar will reconstruct Charles Dickens' travels through the United States in 1842. We'll read his travel narrative, the novel he wrote about the United States, and critical responses. We'll visit some of the place he visited. And we'll produce our own responses to Dickens's work, including in the twenty-first century's favorite serial form: the podcast.

DIGGING EGYPT'S PAST: HARVARD AND EGYPTIAN ARCHAEOLOGY
Peter Der Manuelian (Department of Anthropology and of Near Eastern Languages and Civilizations)

Freshman Seminar 30G  4 credits (fall term)  Enrollment: Limited to 12

In 1905, Harvard University and the Museum of Fine Arts, Boston (MFA), teamed up to conduct excavations in Egypt and Nubia (modern Sudan). No one knew then that the Harvard-MFA Expedition would run for forty-plus years, cover twenty-three different sites, and discover hundreds of thousands of artifacts, art masterpieces, and other treasures, as well as contribute fundamentally to our knowledge of ancient Egyptian history. Egyptologist, Harvard Professor, and MFA curator George Reisner (1867–1942) ran the Expedition from “Harvard Camp,” his mud-brick headquarters just behind the famous Giza Pyramids. Reisner was ahead of his time in revolutionizing the development of responsible archaeological methods. This seminar takes a chronological tour in the footsteps of this historic dig, focusing on topics such as early Harvard and MFA history, the development of archaeological method in the early twentieth century, Western imperialism and colonialism and the role of archaeology, current attitudes toward repatriation of cultural patrimony, and new technologies for studying the Expedition’s legacy. Students will access unpublished archival documents at Harvard and elsewhere, and will research important expedition members and events. Field trips to the Peabody Museum, the MFA, Harvard’s Visualization Center (3D Giza Pyramids), Harvard Semitic Museum, and other locations will bring the Expedition to life. The secret and mysterious burial of an Egyptian queen beside the Great Pyramid at Giza may form a special focus during parts of the semester.
DREAMS: OUR MIND BY NIGHT
Deirdre L. Barrett (Harvard Medical School)

Freshman Seminar 26F 4 credits (fall term) Enrollment: Limited to 15

John Steinbeck wrote: “It is a common experience that a problem difficult at night is resolved in the morning after the committee of sleep has worked on it.” Steinbeck doesn’t name the dream as spokesperson for the Committee of Sleep. However, most stories of nocturnal problem solving involve dreams. They are documented to have given the waking world one Nobel laureate’s scientific experiment, music from classical masterpieces to pop chartbusters, innumerable novels and paintings, and inventions from the automated sewing machine to the computerized anti-aircraft gun. This seminar examines dreams with an emphasis on their relation to the creative process and problem solving. We’ll first read about a variety of psychological aspects of dreaming—neurophysiology, biochemical, clinical, personality, and lucid dreaming research. The seminar also includes perspectives from history, religion, art, literature, and anthropology. In the later part we’ll focus on the phenomena of problem solving and creativity in dreams—both the historic anecdotes and modern research on college students attempting to ‘incubate’ problem-solving dreams and how this may relate to which brain areas are active during dreaming sleep. We’ll visit a sleep laboratory and a dream artist’s studio. You’ll get a chance to work with your own dreams—in at-home assignments and in-class exercises. You’ll keep a dream journal for the first half of the seminar, participate in experiential dreamwork exercises, and write a term paper to explore a topic of your choice in more depth.

EARLY 20TH CENTURY AMERICAN AND ENGLISH POETRY:
LOVE, WAR, RELIGION AND NATURE, W. B. YEATS,
T. S. ELIOT, ELIZABETH BISHOP, W. H. AUDEN
Neil L. Rudenstine (Department of English)

Freshman Seminar 62I 4 credits (fall term) Enrollment: Limited to 12

This seminar will focus on a few early twentieth century poets and a limited number of their most significant poems, ranging from their earliest verse to their latest. We will read the poetry in detail in order to understand not only its major themes but also its variety of tones, styles and structures. The hope will be to discover how each writer developed over the course of his or her career. The seminar will be run as a lively discussion intended to help us understand the extremely challenging as well as deeply rewarding verse that we will encounter. In the work of William Butler Yeats, we will trace, for example, major changes in his conception of love, as well as his complex views of Irish nationalism and the Irish revolution. Meanwhile, in T.S. Eliot, we encounter a narrator whose essential quest is spiritual in nature, beginning with Prufrock and then The Wasteland (to which we will devote two weeks). Elizabeth Bishop introduces a highly original voice that expresses personal emotions obliquely and, in effect, “objectively” through understated descriptions of events and places. Finally, W.H. Auden’s trajectory reveals an early (1930s) portrayal of human nature and society that is in certain respects similar to Eliot’s but that ends very differently, suggesting values and modes of life that are far less foreboding. In the seminar’s first week, we will read and analyze a small group of lyrics by Emily Dickinson and a few other writers (none of whom will be identified by name or exact time-period). This will be an exercise in “close reading” intended to help us judge poetic quality, because some of the lyrics will be excellent—and some quite dismal!
THE ECONOMIST’S VIEW OF THE WORLD
N. Gregory Mankiw (Department of Economics)

Freshman Seminar 43J 4 credits (fall term) Enrollment: Limited to 15

Note: Students are expected to have had some background in economics, such as an AP economics course in high school or simultaneous enrollment in Economics 10a.

This seminar’s goal is to probe how economists of various perspectives view human behavior and the proper role of government in society. Each week, seminar participants will read a brief, nontechnical, policy-oriented book by a prominent economist. The participants will then discuss the work’s strengths and weaknesses, exploring the positive scientific judgments and normative value systems that underlie each author’s policy prescriptions.

Each week, as preparation for the class meeting, each seminar participant is expected to send the instructor a brief email describing his or her views of the week’s reading. In addition, each participant will have the opportunity to write his or her own essay addressing an economic policy issue. The essay will be read and discussed by all seminar participants.

ECONOMISTS ON BUILDING A BETTER SOCIETY
Jason L. Furman (Harvard Kennedy School)

Freshman Seminar 71K 4 credits (spring term) Enrollment: Limited to 12

This seminar will provide you with a broad perspective on the views that economists and economic thinkers have had on how to build a better society. We will discuss more foundational questions including: (i) the role of individual freedom to make choices vs. the importance of public policy in helping people fully realize their potential, (ii) the ways that markets and governments succeed and fail, (iii) the downsides and upsides of economic inequality, and (iv) the degree to which we should think of people as behaving rationally or not. Each week we read a different book by an economist, often with contrasting perspectives on these issues, and discuss and debate the relevance of its arguments and how they shape our thinking about both economics and a broader set of questions we all confront in society.

ENERGY: BE THE CHANGE
Mara Prentiss (Department of Physics)

Freshman Seminar 27K 4 credits (fall term) Enrollment: Limited to 12

In the U.S., energy use creates large political and social tensions and much emphasis is placed on climate change. In China, health issues surrounding energy use are emerging as a critical issue. Importantly, there are many areas where the role of energy is often overlooked. A large fraction of current geopolitical tensions arise from issues originating in energy consumption, and that fraction may increase as water use and energy use become more closely tied. Too many
discussions of energy focus on one feature of the problem, without considering how a change in one area will inevitably ripple out with the power to transform our relationships with each other and with the physical world. Some of those ripple effects are enormously positive, others are not. The goal of the seminar will be to choose energy changes that we would like to see happen and to form a realistic plan for making that change occur. An important feature of the discussion will be considerations about what is physically possible; however, the major emphasis will be on trying to understand the connections that will be altered by that change. Any change, however laudable, inevitably creates both winners and losers. For change to occur, losers must at least be brought to accept the change. One goal of the seminar will be to establish local and global forums that allow us to learn more about people’s reactions to proposals for energy change so that our proposals for change have a real possibility of coming to pass.

THE EVOLUTIONARY TRANSITION FROM DINOSAURS TO BIRDS: FOSSILS, GENOMES AND BEHAVIOR
Scott V. Edwards (Department of Organismic and Evolutionary Biology)

Freshman Seminar 21R  4 credits (fall term)  Enrollment: Limited to 12

Note: There will be a required trip to the Museum of Natural History in New York City, date to be decided.

The transition of dinosaurs to birds is quickly becoming one of the most complete records of evolutionary change in the vertebrate fossil record. Additionally it is an excellent model of science building on incremental discoveries and undergoing paradigm shifts as new data are collected. In this seminar we will explore the dinosaurian origins of modern birds through focused readings and discussion, as well as exploration of Harvard’s excellent collections of dinosaur fossils and skeletons and specimens of extant birds. The detail available in recent fossil discoveries, especially from China, allows scientists to make inferences not only about dinosaur morphology, but also about dinosaur behavior and even genomics. At the same time, many evolutionary novelties that formerly were considered bird-specific adaptations, such as feathers and high metabolic rates, are now known to have arisen deep in the history of non-flying dinosaurs. Despite their exquisite detail, the exponential increase in new fossils and data leaves scientists wondering: what in fact is a bird and what has driven their 90 million year transformation from theropod dinosaurs? In addition to weekly readings, we will visit the amazing collections of the Museum of Comparative Zoology, engage in virtual conversations with paleontologists from China and beyond and ultimately make a visit to the greatest dinosaur collection on earth at the American Museum of Natural History in New York City. The goal throughout will be to gain a greater appreciation of dinosaur diversity, ecology and behavior and to better understand the deep origins of modern bird adaptations.
EXPLORING THE INFINITE
Peter Koellner (Department of Philosophy) & W. Hugh Woodin (Department of Mathematics and of Philosophy)

Freshman Seminar 23C  4 credits (spring term)  Enrollment: Limited to 12

Infinity captivates the imagination. A child stands between two mirrors and sees herself reflected over and over again, smaller and smaller, trailing off to infinity. Does it go on forever? ... Does anything go on forever? Does life go on forever? Does time go on forever? Does the universe go on forever? Is there anything that we can be certain goes on forever? ... It would seem that the counting numbers go on forever, since given any number on can always add one. But is that the extent of forever? Or are there numbers that go beyond that? Are there higher and higher levels of infinity? And, if so, does the totality of all of these levels of infinity itself constitute the highest, most ultimate, level of infinity, the absolutely infinite? In this seminar we will focus on the mathematical infinite. We will start with the so-called “paradoxes of the infinite,” paradoxes that have led some to the conclusion that the concept of infinity is incoherent. We will see, however, that what these paradoxes ultimately show is that the infinite is just quite different than the finite and that by being very careful we can sharpen the concept of infinity so that these paradoxes are transformed into surprising discoveries. We will follow the historical development, starting with the work of Cantor at the end of the nineteenth century, and proceeding up to the present. The study of the infinite has blossomed into a beautiful branch of mathematics. We will get a glimpse of this subject, and the many levels of infinity, and we will see that the infinite is even more magnificent than one might ever have imagined.

FAITH AND FICTION IN AMERICAN HISTORY
David F. Holland (Harvard Divinity School)

Freshman Seminar 60H  4 credits (fall term)  Enrollment: Limited to 12

This seminar uses key literary works to explore some of the most difficult and demanding questions in the religious history of the United States: Does God have a special relationship with the United States? Is sin an individual responsibility or a social flaw? Why has American religion been so frequently concerned with sexuality? How has religion shaped racial identities and tensions? How does it inform domestic relationships? How do non-Christian immigrants find a place and a voice in a nation with deeply entrenched Christian traditions? To explore these and other areas of concern, we bore into the faith-inflected cultures of American history through the imagined narratives of some of its most celebrated writers, including the likes of Catharine Sedgwick, Harriet Wilson, Flannery O’Connor, James Baldwin, Rudolfo Anaya, Pearl Abraham, Ayad Akhtar, and Marilynne Robinson. I will offer mini-lectures to contextualize these works in their historical moment. We will read some scholarly work to sharpen our tools of analysis, but mostly we will read and talk about the novels themselves. The seminar aims to be both analytically rigorous and aesthetically rewarding.
FEELING THE HEAT? THE MANY TEMPERATURES OF LIFE IN A WARMING WORLD

Fulton E. Rockwell (Department of Organismic and Evolutionary Biology) & N. Michele Holbrook (Department of Organismic and Evolutionary Biology)

Freshman Seminar 51L  4 credits (spring term)  Enrollment: Limited to 12

Prerequisites: There are no prerequisites, and students geared toward either the humanities or sciences are welcome.

Note: There will be a required (moderate) hiking day trip to the White Mountains in New Hampshire.

From one’s first thought in the morning (“how hot will it be today?”), to a concern over the future of our climate (“how hot will it be in 2100?”), temperature is a ubiquitous topic in our lives. But what exactly does temperature measure? And of all the temperatures that one might define and measure, which are the important ones? In this seminar we will explore how organisms experience and respond to temperature, investigate the different modes by which plants and animals exchange thermal energy, and ask what strategies have evolved for thermal management. An important feature of temperature responses at any scale is that otherwise gradual changes can be punctuated by abrupt changes of state. This is true for as simple a system as pure water transitioning from solid to liquid to vapor, or as complex as a biome transitioning from forest to grassland to desert. Our goal is to develop, through reading, discussion, in-class experiments, and a field trip to the White Mountains, an “educated intuition” for how life responds to temperature in both predictable and unpredictable ways. Along the way we will touch on a broad array of topics, from human health to the growth of food crops, and consider how these might change as our planet warms.

FIRST STARS AND LIFE IN THE COSMOS

Abraham Loeb (Department of Astronomy)

Freshman Seminar 21G  4 credits (spring term)  Enrollment: Limited to 12

Since the Universe is expanding, it must have been denser in the past. But even before we get all the way back to the Big Bang, there must have been a time when stars like our Sun did not exist because the Universe was denser than they are. Since stars are needed to keep us warm, we face the important question about our origins: how and when did the first stars form? Primitive versions of this question were considered by humans in religious and philosophical texts for thousands of years. The seminar will summarize the fundamental principles and scientific ideas that are being used to address this question in modern cosmology. Eventually, the formation of stars like the Sun was accompanied by planets like the Earth on which life has emerged. When did life start in the cosmos and when will it all end? The seminar will describe current plans to search for extraterrestrial life, including project “Starshot” which aims to visit the nearest stars within our lifetime and send close-up photos of their planets.

This class was exactly what I was looking for as an introduction into college. This was a classic Harvard/liberal arts class that was different than my large lecture hall classes.
THE FOLKLORE OF GAELIC SCOTLAND
Natasha D. Sumner (Department of Celtic Languages and Literatures)

Freshman Seminar 34F 4 credits (fall term)  Enrollment: Limited to 12

Note: No knowledge of Scottish Gaelic is required for this seminar. The seminar will also include an end-of-term “ceilidh,” a traditional social gathering often involving song, dance, and/or storytelling.

“There’s no place on earth with more magic and superstition mixed into its daily life than the Scottish Highlands.” So says Claire’s husband in Season 1, Episode 1 of ‘Outlander.’ This seminar explores that premise. Highland folklore exploded onto the world stage in the 1760s with the publication of Macpherson’s “Ossian” poems, which he alleged to have translated from Gaelic originals. Avid fans included Napoleon and Goethe. The ensuing controversy motivated scholars to record Scotland’s Gaelic folklore. The “treasure house” they discovered has amazed those interested in traditional cultures ever since. Time Magazine reported in 1948 that folklore collectors working with Angus MacMillan, a farmer, expected to fill 20 volumes. The longest Gaelic folktale MacMillan told took nine hours to record. Gaelic folklore includes tales about ancient heroes like Finn McCool, and strongly held beliefs in malevolent fairies, seal-people, dangerous water-horses, the evil eye and second sight. Gaelic folk song traditions in Scotland are also particularly resilient. As we explore these fascinating topics, we will take into account international scholarly approaches to folklore. Scottish folklore has been a topic of serious study at Harvard since Francis James Child, Harvard’s first Professor of English, published English and Scottish Popular Ballads (1882–98). Charles Dunn, Chair of the Department of Celtic Languages and Literatures from 1962–84, specialized in Scottish Gaelic folklore. His recordings of the tales and songs of the Gaelic diaspora in Canada are held by Harvard and have been recently digitized.

FRANKENSTEIN: TWO HUNDRED YEARS OF DR. FRANKENSTEIN’S MONSTER IN SCIENCE AND CULTURE, 1818–2018
Janet E. Browne (Department of the History of Science)

Freshman Seminar 62K 4 credits (fall term)  Enrollment: Limited to 12

“It lives!” Since his dull yellow eye first opened in the pages of Mary Shelley’s novel of 1818, Victor Frankenstein’s creature has occupied a key place in Western culture. This year is the 200th anniversary of publication. Mary Shelley was only 19 when she first mapped out the monster’s story, and 21 when it was published. Our seminar aims to think seriously about the mingling of literature and science in this important creative work. We will read and analyze the novel together, cover Shelley’s life and times, consider some of the major interpretations that have been offered, especially thinking about the story as an alternative to traditional creation legends, and explore the history of science of her day. We will also engage with the movie tradition. Students will have an opportunity to research the continuing metaphor of Frankenstein in modern Franken-themes such as genetic engineering, test-tube babies, and GMOs.

FRESHMAN SEMINAR PROGRAM
FREE SPEECH
Sanford J. Ungar (Department of Government)

Freshman Seminar 40L  4 credits (fall term)  Enrollment: Limited to 12

In this age of rapid globalization and heightened cross-cultural contacts, nations struggle to reaffirm their identities and values. In the United States, one of the most precious values is free speech, embedded in the First Amendment to the Constitution and regarded as a keystone of American democracy. But arguments over the boundaries of free speech have become intense, especially in the era of electronic communication. This seminar will examine the dialogue taking place within the United States and around the world on free speech issues—sometimes civil, but often a political or cultural confrontation that turns violent. We will discuss international and domestic protests over politically sensitive cartoons, controversies over Holocaust denial, whether hate speech should be banned on campuses, whether the domestic media can ever be legitimately constrained on national security grounds, whether anti-gay religious activists have a right to disrupt military funerals, whether pornography and violent music lyrics should be regulated, and what constitutes free speech on the Internet or cell phones. Through Supreme Court decisions and by other means, we will examine the debate over what it means to be patriotic and whether patriotism requires Americans to say, or prohibits them from saying, certain things—and examine how standards have changed over the years. We will ask whether other countries’ attitudes toward free speech and the other First Amendment freedoms should influence U.S. foreign policy toward those countries. Examples of constraints on free speech in our daily lives and work, unwitting or not, will also be considered.

FROM THE ARAB SPRING TO ISIS: NATIONAL SECURITY CHALLENGES IN THE MID EAST
Charles D. Freilich (Department of Government)

Freshman Seminar 42N  4 credits (spring term)  Enrollment: Limited to 12

The Middle East is home to many diverse peoples, with ancient and proud cultures, in varying stages of political and socio-economic development, often times in conflict. Now in a state of historic flux, the Arab Spring and subsequent regional tumult have transformed the Middle Eastern landscape, with great consequences for the national security strategies of the countries of the region. The primary source of the world’s energy resources, the Middle East remains the locus of the terror-WMD-fundamentalist nexus, which poses a significant threat to regional and international security, as does the rise of ISIS. The seminar surveys the national security challenges facing the region’s primary players (Egypt, Saudi Arabia, Iran, Iraq, Syria, Lebanon, Israel, the Palestinians, Jordan, and Turkey) and how the recent upheaval has affected them. Unlike many Middle East courses, which focus on U.S. policy in the region, the seminar concentrates on the regional players’ perceptions of the threats and opportunities they face and on the strategies they have adopted to deal with them. Students play the role of senior advisers to the actual regional leaders in power and write “real world” policy papers for them, from their perspective and given the strategic, political and personal constraints they face. The seminar provides an essential vantage point for all those interested in gaining a deeper understanding of the region, especially those with an interest in “real world” international relations and national security.
GEOSCIIFI MOVIES: REAL VS. FICTION
Miaki Ishii (Department of Earth and Planetary Sciences)

**Freshman Seminar 23I  4 credits (fall term)  Enrollment: Limited to 12**

*Note: Students are required to watch the assigned movie prior to class, and must be comfortable with high-school level math and science.*

Natural disasters such as earthquakes, tsunamis, hurricanes, and volcanic eruptions have major impact on society and cause great tragedies. The participants in this seminar will examine one Earth science-related science fiction movie each week and discusses features that are real and fictitious based upon our current understanding of the science of disastrous events. Simple math and science concepts are used to test how likely some effects are (e.g., is a magnitude 11 earthquake possible and why?), and to understand the underlying science behind these features (e.g., what are the factors that control the size of an earthquake?). If applicable, we discuss how these scientific ideas are exaggerated to dramatize the effects.

GLOBAL CAPITALISM: PAST, PRESENT, FUTURE
Sophus A. Reinert (Harvard Business School)

**Freshman Seminar 71M  4 credits (spring term)  Enrollment: Limited to 12**

Capitalism has powerfully shaped human history, and continues to shape the world we live in. The opinions of its defenders and defamers saturate our media landscape. But what do we mean by “capitalism”? Since their historical origins, “capitalist” values and practices have been the principal drivers of a process today known as “globalization,” unfolding through both peaceful and violent means, which has brought disparate parts of the world together in a network of politically independent yet economically interdependent states and non-state actors. But how did capitalism come about? How is wealth created, why do we inhabit a world of “developed” and “emerging” markets, and what are the origins of economic inequality within and between nations? What futures might await what we call global capitalism? This seminar introduces students to the Socratic teaching method used in the Harvard Business School and is based on case studies covering the vast epic of capitalism. Where some cases are historical, considering topics such as the Great Divergence and the consequences of colonialism, others turn to contemporary conditions in the world’s major regions and, ultimately, to the great transformations now underway and lying ahead. In addition to discussing the past, present, and future of capitalism, the seminar will familiarize students with basic concepts of macroeconomics as well as tools, such as balance of payments analysis and national economic accounting to prepare them for lives of active global citizenship.
GLOBAL CRIME FICTION: TACKLING CRIME, CORRUPTION, AND SOCIAL DISINTEGRATION

Karen L. Thornber (Department of Comparative Literature and of East Asian Languages and Civilizations)

Freshman Seminar 61O  4 credits (fall term)  Enrollment: Limited to 12

Crime fiction is one of literature’s most popular genres, with hundreds of millions of fans across the globe. Both local and foreign crime fiction, the latter often in translation, flies off bookshelves from Boston to Barcelona to Beijing and beyond, regardless of whether the novel takes place in a small Swedish village or in multiple cosmopolitan megacities. Why is this? Part of it is in the storytelling. Who can resist a gripping whodunit with unexpected twists and turns and often with an appealing investigator or detective (professional or amateur), particularly if everything is resolved at the end, and often in ways we least expect? But part of the appeal of crime fiction is also the insights this genre can offer into some of the most significant challenges facing societies globally. In this seminar we will read a selection of bestselling crime fiction from the Americas, Africa, Asia, Europe, and the Middle East. We will be most concerned with what this literature tells us about investigating, exposing, and potentially ameliorating historical crimes, environmental crimes, corruption in criminal justice, and social disintegration, particularly as these involve injustices inflicted on marginalized and otherwise vulnerable individuals and communities, people targeted on account of their class, ethnicity, gender, race, religion, sexuality and other factors. Secondary readings and class discussion will provide the necessary cultural and literary contexts for these readings.

GLOBAL HEALTH: COMPARATIVE ANALYSIS OF HEALTH CARE DELIVERY SYSTEMS

Sanjay Saini (Harvard Medical School)

Freshman Seminar 27I  4 credits (fall term)  Enrollment: Limited to 15

This interactive seminar will allow students to obtain greater understanding of challenges faced by the U.S. healthcare system through critical comparative analysis of healthcare systems of selected countries from the developed, emerging and developing world. Weekly sessions will be comprised of student-led discussion that revolves around an important healthcare issue. Domain expert guest speakers will be included, allowing students to network with thought leaders. Student will explore in-depth a topic of their choice and prepare a manuscript for potential publication in a peer-reviewed journal.
GO ROCOCO! TECHNIQUES IN DIGITAL DESIGN
Andrew J. Holder (Harvard Graduate School of Design)

Freshman Seminar 60Z   4 credits (fall term)   Enrollment: Limited to 12

Note: This seminar is a hybrid design workshop and seminar in the history of eighteenth-century architecture. Students will learn to use state-of-the-art digital design tools while critically examining canonical examples of late baroque and Rococo buildings. Design skill, artistic ability, and prior exposure to digital modeling software are NOT required for this seminar, nor is any prior knowledge of architecture. Absolute neophytes are welcome. Students do not need to purchase software or any computer equipment in order to participate.

At the beginning of the eighteenth century, baroque architecture and art in Western Europe entered a new phase called the Rococo, characterized by extreme visual complexity, ornamentation, and the collapse of compositional and political hierarchy. Architectural interiors became excessive (or at least no longer classically ordered) during this period, filled almost to the point of overflowing with painting, sculpture, and decoration, much of it depicting characters in mischievous and compromising postures. This seminar will examine the Rococo as a precedent for reflection on problems in contemporary design and as a provocation to create new work using digital design tools. Seminar work will be founded on two related propositions: first, that the architecture and art of the Rococo are remarkably similar to the visual and material culture of the present day; and second, that contemporary design stands to benefit from a close examination of its predecessor. Activities will be divided between reading, writing, and making. Each week, students will examine a Rococo building precedent, reading the architecture against a series of texts on contemporary design issues. In addition, each student will undertake a semester-long design project using digital design tools to create and animate an architectural interior in the manner of the Rococo. Software tutorials on the Adobe Creative Cloud software suite will be provided in class. Readings and tutorials will be supplemented with field trips to the Houghton Library and Fogg Museum to experience Rococo artifacts firsthand.
THE GRAIL QUEST OF MARCEL PROUST

Virginie Greene (Department of Romance Languages and Literatures)

Freshman Seminar 60K 4 credits (fall term) Enrollment: Limited to 12

Note: No previous knowledge of the Middle Ages, Proust, or French is necessary. Texts will be available in English and French. All locations will be wheelchair accessible and reachable by public transportation.

We will read Chrétien de Troyes’ Tale of the Grail, the most ancient known Grail story (c. 1190) and large excerpts of Marcel Proust’s In Search of Lost Time, which I propose to read as a Grail quest, involving a young ignorant hero discovering the world and seeking something else than money, fame, and love (but also money, fame, and love). Through comparing a medieval and a modern text we will reflect on the passing of time, modernity and memory, reality and fiction, romance and novel. We will focus on the visual aspects of both stories, whose heroes share a contemplative/voyeuristic temper. The Tale of the Grail has generated an immense corpus of images from thirteenth-century illuminated manuscripts to the 1895 Edwin Austin Abbey wall paintings at the Boston Public Library and Grail films (1975 Monty Python Holy Grail, 1981 Raiders of the Lost Ark, etc.). In Search of Lost Time has been called a “cathedral work,” that is, like a Gothic cathedral, a space of eclectic visions. Real and fictional paintings illuminate the novel like a medieval manuscript. All members of the seminar will be invited to share their experiences of reading, viewing, and writing. Texts will be available in English and French. The seminar will follow the model of a quest: each class will be held in a different location (Harvard house, museum, garden, etc.) in the Boston area.

HARVARD’S GREATEST HITS: THE MOST IMPORTANT, RAREST, AND MOST VALUABLE BOOKS IN HOUGHTON LIBRARY

David Stern (Department of Near Eastern Languages and Civilizations and of Comparative Literature)

Freshman Seminar 62J 4 credits (fall term) Enrollment: Limited to 12

Have you ever fantasized of turning the pages of a Gutenberg Bible with your own fingers? Then this seminar is for you. The Houghton Library of Harvard University is one of the world’s greatest repositories of ancient scrolls, papyrus codices, illuminated manuscripts on parchment and paper, early printed books, rare books published since the sixteenth century down until today, and stunning prints and other types of graphic art. In this freshman seminar, we will utilize Houghton’s extraordinary holdings to study first-hand the history of the book in the West as a material artifact from its beginnings in the ancient Near East down to the present day. Each week we will focus upon one or more books: a papyrus codex of Homer, a Torah scroll, a medieval illustrated Book of Hours, the Gutenberg Bible, the First Folio Edition of Shakespeare’s works, the King James Bible, Galileo’s Siderius Nuncius, and Alice in Wonderland, to name just a few of the works we will examine. During class-time, we will study the books again as a group. Visiting experts will demonstrate how to unroll a papyrus codex, the
technology involved in printing on a hand-pulled press, and the techniques modern conservators use to preserve manuscripts and books. You will emerge from this seminar with a heightened understanding of what a rich thing a book is, so much more than just a text. And you will have seen and studied close-up some of the most visually spectacular and culturally significant books in all of Western history.

**THE HEART OF MEDICINE: PATIENTS AND PHYSICIANS AND THE EXPERIENCE OF SERIOUS ILLNESS**

Susan D. Block (Harvard Medical School)

| Freshman Seminar 71O | 4 credits (fall term) | Enrollment: Limited to 12 |

Sickness and death are universal human experiences. Yet we are often uncomfortable talking and thinking about them in relation to ourselves, and to those whom we love. The core thesis of this seminar is that exploring these human vulnerabilities is a way of learning to live a more meaningful life, strengthening relationships, and helping us be better caretakers of people we love, and of people whom we serve in a professional role. In this seminar, we propose to examine, from multiple perspectives, the social, cultural, psychological, economic, and spiritual factors that influence the experience of serious illness. The seminar will draw on core readings from the humanities, social sciences, and medicine to deepen understandings of how people experience and live and die with a serious illness. Opportunities for discussion, reflection, live interviews, case analysis, and experiential exercises will take place in class; additional field learning opportunities (e.g., home visits, participation in hospital-based teaching rounds) may also be available outside of class.

**HORROR IN LITERATURE AND MOVIES: CULTURAL, PSYCHOLOGICAL, AND SCIENTIFIC ASPECTS OF THE HORROR GENRE**

Steven C. Schlozman (Harvard Medical School)

| Freshman Seminar 37K | 4 credits (fall term) | Enrollment: Limited to 15 |

Horror films and horror stories have been in existence since movies and stories themselves have been in existence. In other words, from the time that humans could tell stories, some of those stories have been deliberately frightening. Nevertheless, a clear definition of horror as a genre remains elusive and even controversial. This seminar will attempt to make sense of horror stories. We will work towards a comprehensive definition of fictional horror through careful exploration of scholarly literature from film theorists, literary critics, cultural psychologists, neuroscientists, and the popular press. The seminar will also make use of classic and more recent horror movies and writing. In addition, there will be a strong creative component to this seminar. The instructor is a physician and an assistant professor at Harvard Medical School and also a professional horror writer. He will utilize many of the techniques that have been incorporated into writing workshops, panel discussions, and film festivals in which he has himself participated. In this fashion, we will as a seminar develop our own sense of what constitutes horror through careful academic scrutiny of the topic and through the honing of our own creative talents.
HUMAN BRAIN IN HEALTH AND DISEASE: A NEUROLOGIST’S PERSPECTIVE
Thomas N. Byrne (Harvard Medical School)

Freshman Seminar 25X  4 credits (fall term)  Enrollment: Limited to 15

Note: The seminar is intended for those who have scored 5 on AP Biology or Chemistry.

Is the human mind an “emergent” property of the brain? How might that occur? We study how structure and properties of the brain and mind are shaped by biology, chemistry, experience and disease. For example, experiences during “critical periods” modify brain anatomy/function; learning a foreign language before or after puberty is revealed by a native or foreign accent. Mirror neurons play a role in perception, motor skills and emotion. Examples include “contagious” happiness or sadness, empathy and theory of mind; their dysfunction may cause autism. Beyond these “bottoms up” explanations, we will also consider a “top down” approach, in which the intention or purpose of a behavior or idea can “pull” our behavior or state of mind, what Aristotle termed “Final Cause.” The human brain/mind is a pattern-seeking organ that uses logical patterns to predict the future. From infancy we make sense of the world by seeking logical patterns; mathematics is “core knowledge” of infants. We then use these patterns to look into the future to anticipate where a given pattern will lead and are thus “pulled” to that goal or not; thus the goal can determine behavior and worldview. We read Victor Frankl’s “Man’s Search for Meaning” which explores human thought, behavior and purpose. This seminar straddles the realms of science, which asks “how?” and the humanities, which traditionally asks “why?” and strives to reconcile these two approaches to understanding the world and our place in it.

HUMAN RIGHTS AND THE GLOBAL SOUTH
Jacqueline Bhabha (Harvard T.H. Chan School of Public Health) & Caroline M. Elkins (Department of History and of African and African American Studies)

Freshman Seminar 43C  4 credits (fall term)  Enrollment: Limited to 12

Human rights have become a global lingua franca, invoked by leaders and movements across the political, religious and cultural spectrum. Because they can come into conflict with each other, human rights can serve to justify wars (to combat terrorists), religious intolerance (to counter fundamentalists), gender discrimination (to support religious tenets), and refusal of safe haven to refugees (to promote domestic human security). Despite over half a century of international law making and domestic enactment of human rights treaties, and despite a vibrant civil society that has embraced human rights principles world-wide, remedies for violations such as torture, rape, genocide, political or economic persecution, and crippling destitution, remain elusive. This dilemma is particularly clear in situations of forced migration, when vulnerable populations are separated from individuals and institutions that traditionally provide support. This seminar will focus on the Global South and address key issues in contemporary human rights theory and practice through the lens of displaced, disenfranchised, and threatened individuals and groups. Members of the seminar will first study the philosophical and political traditions that led to codification of human rights. The seminar will then cover the legal frameworks of contemporary international human rights and humanitarian law and examine how they affect some of the most
egregious human rights violations of the current period. Case studies of pivotal controversies and decisions will be examined to explore such questions as who is a refugee or an internally displaced person (IDP), what is trafficking, when is deportation justified, what protections do civilians have in conflict settings, and what are major crimes of atrocity and war?

**HUMAN RIGHTS, LAW AND ADVOCACY**

Susan H. Farbstein (Harvard Law School)

**Freshman Seminar 41K 4 credits (spring term) Enrollment: Limited to 12**

Human rights practitioners confront numerous ethical, strategic, and legal dilemmas in their struggles for social justice. This freshman seminar explores the underlying legal framework in which human rights advocates operate, and then uses specific case studies to consider the various challenges they must grapple with in their work. The seminar is designed to encourage students to critically evaluate the human rights movement while offering an introduction to some of the essential tools and strategies used by human rights advocates, including advocacy, litigation, documentation, and report writing. Students will be asked to grapple with tough questions, such as: How can human rights be harnessed to successfully influence and change behavior? What does responsible, effective human rights advocacy look like? How do we engage without perpetuating power differentials along geopolitical, class, race, gender, and other lines? How do we find ways to work in collaboration with directly affected communities? What does it mean to be a human rights advocate working on abuses affecting individuals and communities remote from yourself? How do you balance broader advocacy goals with the needs of individual survivors or clients? How do you determine when to intervene and devote limited resources to a given issue?

Students will also consider a series of dynamics (e.g., north/south, insider/outside, donor/donee, lawyer/non-lawyer) that influence how and why advocacy is formulated and received. Finally, the seminar considers the limits of the human rights paradigm and established methodologies, such as litigation and “naming and shaming,” and explores alternative sources and forms of advocacy, including the role of community lawyering in the human rights context.

This class was the best decision I ever made!!!

If you take this class, you will find yourself within a warm community with [...] the best professors you will ever have, who will support your academic endeavors for years to come. The professors truly want all of their students to succeed, not just in this class but for the rest of your academic career and beyond. This class was an incredible intellectual experience that helped me find my direction ethically [...].
IN PURSUIT OF THE ORDINARY: GENRE PAINTING IN BOSTON-AREA MUSEUMS
Joseph L. Koerner (Department of the History of Art and Architecture)
Freshman Seminar 31M  4 credits (fall term)  Enrollment: Limited to 12

This seminar will focus on “genre” pictures, that is, depictions—painted on canvas or panel or sketched or printed on paper—of everyday life. Examining key examples in ten different Boston-area collections, the seminar will investigate the changing nature and value of the genre picture from its emergence as a specialty product in early modern Europe through its rejection in Modernist art practice. At the same time as we study how artists of the past pictured everyday life, we will consider what the current study of the fine arts, in its practices of scholarship, criticism, collection, preservation and display, imagines the “everyday” to be. The seminar will conduct its meetings on site at various local museums.

INSIGHTS FROM NARRATIVES OF ILLNESS
Jerome E. Groopman (Harvard Medical School)
Freshman Seminar 23K  4 credits (spring term)  Enrollment: Limited to 12

A physician occupies a unique perch, regularly witnessing life’s great mysteries: the miracle of birth, the perplexing moment of death, and the struggle to find meaning in suffering. It is no wonder that narratives of illness have been of interest to both physician and non-physician writers. This seminar will examine and interrogate both literary and journalistic dimensions of medical writing. The investigation will be chronological, beginning with “classic” narratives by Tolstoy, Chekhov, and Kafka, and then moving on to more contemporary authors such as William Carlos Williams, Richard Selzer, Oliver Sacks, Susan Sontag, and Philip Roth. Controversial and contentious subjects are sought in these writings: the imbalance of power between physician and patient; how different religions frame the genesis and outcome of disease; the role of quackery, avarice, and ego in molding doctors’ behavior; whether character changes for better or worse when people face their mortality; what is normal and what is abnormal behavior based on culture, neuroscience, and individual versus group norms. The presentation of illness in journalism will be studied in selected readings from the New York Times’ and Boston Globe’s Science sections, as well as periodicals like the New Yorker, The New York Review of Books, Harper’s, and The Atlantic. The members of the seminar will analyze how the media accurately present the science of medicine or play to “pop culture.” The seminar will study not only mainstream medical journalists, but so-called alternative medical writers such as Andrew Weil as well. Patients with different diseases will be invited to speak to the members of the seminar about their experiences. Students will try their hands at different forms of medical writing, such as an editorial on physician-assisted suicide that would appear in a newspaper and a short story that describes a personal or family experience with illness and the medical system.
JEFFERSON AND HAMILTON: DUELING AMERICAN VISIONS
Annette Gordon-Reed (Harvard Law School and Department of History [FAS])

Freshman Seminar 61H  4 credits (fall term)  Enrollment: Limited to 12

It is often said that the United States is a country based upon ideas, rather than blood ties. Shortly after the end of the American Revolution, and during the ratification of the Constitution, it became apparent that the people who had helped to make the Revolution differed about exactly what ideas would define America’s experiment in self-government. Two men, Thomas Jefferson and Alexander Hamilton, symbolized the conflicting visions that emerged once the revolutionaries began the business of running a new country. Jefferson was Secretary of State and Hamilton was Secretary of Treasury in Washington’s cabinet. They started cordially enough, but their contrasting views about politics and government quickly hardened into personal enmity. Much to President Washington’s chagrin, they battled in cabinet meetings and—through surrogates and pseudonyms—in newspapers. Their clash helped create two-party politics in America, as each man attracted adherents to their respective visions of the future of the United States. Jefferson was the rural “man of the people,” anti-British to his core, and supporter of the French Revolution. Hamilton was the urban friend of the elites in society, admirer of the British government, and opponent of the French Revolution. Their arguments about the true nature of American society continue today. This seminar will examine Jefferson and Hamilton as men, the way they fought their battle, and the nature of Jeffersonian and Hamiltonian visions. What did the men and their visions mean at the time, and what do they mean to us today?

KEEPING IT SIMPLE: CONSUMER FINANCIAL PROTECTION IN A COMPLEX WORLD
John Y. Campbell (Department of Economics)

Freshman Seminar 70Q  4 credits (fall term)  Enrollment: Limited to 12

People face a daunting array of problems in managing their financial lives. Taking out student loans, managing bank accounts and credit cards, financing a home purchase with a mortgage, and saving for retirement are all major challenges. There is evidence that many people lack the skills they need to meet these challenges. This seminar has three goals. The first objective is to give participants a basic grounding in financial literacy: principles of finance that we can use in our own lives. The second objective is to introduce research on the ways in which households use the financial system, emphasizing common financial mistakes and financial products that seem prone to misuse. We will learn to read papers from the academic economics literature, focusing on the papers’ central ideas and empirical findings. The third objective is to explore ways in which the financial system can be improved to make it easier and safer to use. We will discuss the role of financial advisers, technological solutions (“fintech”), and public policy interventions including required disclosures, default choices (“nudges”), and regulations restricting access to financial products. We will monitor developments at the Consumer Financial Protection Bureau and other government agencies involved in consumer financial regulation.
KNOWING CICERO
Jared M. Hudson (Department of the Classics)

Freshman Seminar 62L  4 credits (fall term)  Enrollment: Limited to 12

Note: No prior knowledge of Cicero, Latin, or the ancient Roman world is assumed or required in order to take this seminar. The seminar will include a visit to Houghton Library to examine some of the library’s rare manuscripts of Cicero’s works.

More than any other person from Greco–Roman antiquity, the Roman orator, politician, and philosopher Marcus Tullius Cicero (106–43 BCE) appears to be someone we can “get to know.” He was at the very center of political and intellectual life during the turbulent and fascinating final years of the Roman Republic, and left behind a vast record of his activities. Over eight hundred detailed, often highly personal, letters of his survive (most not intended for publication), as well as around a hundred from his correspondents, not to mention his fifty–odd extant speeches (most promoting a particular persona) and several self–portraits in his philosophical and rhetorical dialogues. Such a relative abundance of documentation, together with a fertile and complex afterlife in subsequent literature and culture, has led to a number of assumptions about Cicero’s “character” or “personality”—the man behind so many eloquent words. Yet a quick look at past reactions reveals just how changeable posterity’s judgment of Cicero the man has been, ranging from elaborate praise (“Every one admires the Orator and the Consul; but for my Part, I esteem the Husband and the Father.” Steele, 1710) to harsh criticism (“No other antique personality has inspired such venomous dislike.” Shackleton Bailey, 1971). This seminar offers an in–depth investigation of what it might mean to “know Cicero” today, some two thousand years after he lived. After an introduction to ancient approaches to biography, it will use selections from the Letters alongside scholarly biographies to explore key phases of Cicero’s life in which the most fascinating and vivid glimpses of his personality are on offer. The last sessions will be devoted to contemporary representations of “Cicero the man” in popular fiction and television. By getting to know Cicero we will consider what his compelling life has to teach us about self–presentation, persuasive speech, and the limits of biography.
LANDMARK CASES IN AMERICAN CONSTITUTIONAL HISTORY
Michael J. Klarman (Harvard Law School)

Freshman Seminar 70H 4 credits (fall term)  Enrollment: Limited to 12

This freshman seminar will cover landmark Supreme Court decisions in American history: Marbury v. Madison (1803) (origins of judicial review); Plessy v. Ferguson (1896) (racial segregation in railroad transportation); Korematsu v. United States (1944) (Japanese-American internment); Brown v. Board of Education (1954) (school segregation); Brown II (1955) (Brown’s remedial order); Engel v. Vitale (1962) (school prayer); Reynolds v. Sims (1964) (legislative malapportionment); Miranda v. Arizona (1966) (right against self-incrimination); Furman v. Georgia (1972) (death penalty); Roe v. Wade (1973) (abortion); Bakke v. Board of Regents (1978) (affirmative action); and Obergefell v. Hodges (2015) (gay marriage). Each session will discuss one case or one issue involving a couple of related cases. The seminar’s aim is to elucidate how the Supreme Court functions as a political institution—that is, to see how the Court’s decisions reflect the broader social and political context, and to consider the consequences of its rulings. The readings aim to present enough different angles from which to view the Court’s rulings to enable discussion of how a particular issue—such as the death penalty—became a topic of social controversy and of constitutional law, why Justices’ opinions were written as they were, and an evaluation of the decision’s reasoning and its consequences. Readings for each session will average about two hours. In addition to discussing the readings, students will be required to write three papers reacting to the readings, each of about four or five pages. Students will be afforded some degree of choice in the weeks for which they write papers.

LANGUAGE: THE ORIGINS OF MEANING
Gennaro Chierchia (Department of Linguistics)

Freshman Seminar 61Q 4 credits (fall term)  Enrollment: Limited to 12

Prerequisites: An interest in language and mind, and no fear of formal methods or the desire to overcome such fear.

How do languages work? Why are they so distinctively human in the natural world? Is language a creation of our intelligence, i.e., we speak, because we are smart, or the other way around? Birds produce sophisticated songs. Do bird songs mean anything? They do, in some way. They serve, for example, as predator warnings or mating calls. Humans too, like birds, can produce music. But for effective day-to-day communication (or, say, to develop a scientific theory, etc.), we need languages with words and sentences, i.e., the kind of languages that are unique to our species. Do all languages, in spite of looking so diverse, share a common structure? For example, in English words fall into categories: cat is a noun, meow is a verb. Do all languages have nouns and verbs? A fairly recent turning point in addressing these fundamental questions has been to view language as a computational device. This is enabling us to build effective models of how languages are structured so as to empower us with the ability to create meaning, which, in turn, is shedding light, more and more, on who we are. The seminar will explore how natural languages come to create meaning and invite participants to develop their own linguistic analyses through modern logical and computational tools.
LAW AND SOCIETY THROUGH THE CINEMATIC FRAME
Ofrit Liviatan (Department of Government)

Freshman Seminar 40E 4 credits (spring term)  Enrollment: Limited to 12

In this seminar we will explore the interaction of law and society using the lens of film. The cinematic experience has become a key site through which the public understanding of law is produced, debated and influenced. Driven first and foremost by market and audience considerations, law-related films often inject drama, contentious dimensions and even misrepresentations into the portrayal of real events. Nonetheless, by raising awareness about legal themes that pervade the plot, these films offer valuable insights toward discovering social scientific perspectives on the manner in which law functions in everyday life. Hence, the seminar will not focus on legal doctrine or teach you the fundamentals of the legal profession. Rather, using films as a framework for discussion, we will study law’s working in relations to the social, political, economic and cultural environments in which it operates. Central thematic topics to be discussed include: the relationship between law, justice and morality; how does law intervenes in social relations and whether it is over-utilized as part of these relations; the dynamics between law and social change; is access to the legal process equal to everyone; and the function of law in deeply divided societies. Throughout the semester film viewing will occur outside class as part of your weekly preparation for the seminar. However, we will dedicate one class as a field trip to watch a law-related film together and analyze its themes through the socio-legal perspective.

LAW AT WORK: EMPLOYMENT RIGHTS IN THE AGE OF UBER
Benjamin I. Sachs (Harvard Law School)

Freshman Seminar 70V 4 credits (fall term)  Enrollment: Limited to 12

Work is what most of us do with most of our time. Even before we start a career, we invest our energy in preparing for work and in imagining what work life will be. In this seminar, we explore the multiple ways that law defines what work is like in the contemporary United States. We start with the question of how much power an employer should have over employee: should it really be legal to fire someone for wearing the wrong tie or having the wrong spouse? We then debate the issue of appearance codes, asking whether an employer should be able to require women to wear makeup or to ban employees from having dreadlocks. We will explore the ways in which sexual orientation, gender identity, and immigration status impact employees’ rights at work. And we will ask whether it ever should be legal for an employer to hire employees of only one gender: should Hooters Restaurant, for example, be permitted to hire only women as waiters or should those jobs be equally available to men? The seminar also will examine the way law polices the line between work and “life” by looking at the emerging right-to-disconnect. And the seminar will address the fundamental question of who exactly is an employee: do Uber drivers or college football players count? The seminar concludes with a discussion of the ways technological changes are transforming work and, with it, the law that governs this central feature of our lives.

As a freshman, you’re mostly taking courses that occur in lecture halls, but a seminar is usually capped at 12 people. It’s a close-knit community and you feel very comfortable sharing your thoughts in very dynamic discussion and you also get to know your professor.
LIFE LESSONS FROM PROFESSIONAL KILLERS: WHAT WE CAN LEARN FROM THE SAMURAI
David C. Atherton (Department of East Asian Languages and Civilizations)

**Freshman Seminar 6iK** 4 credits (fall term)  
**Enrollment:** Limited to 12

*Note:* No prior knowledge of Japan is required, and all readings will be in English.

Is it possible to fail successfully? Should we be more beholden to the needs of others or to our own ambitions? Is there a set moral standard by which we should live our lives? What should we be prepared to sacrifice for higher goals—and what if pursuing those goals causes suffering to others? When should we take a risk? Is there such a thing as an ideal human being? Questions such as these have animated the figure of the samurai for nearly a millennium, captivating imaginations both in Japan and around the globe. What is it about this figure that speaks to some of our deepest questions about how to live a model human life? In this seminar, we will explore together the many meanings people have invested in the Japanese warrior, from medieval epics to kabuki plays, modern novels to propaganda, manga and anime to global cinematic blockbusters (Tom Cruise, anyone?). Our focus will be less on the historical realities of the samurai than on the ways people have chosen to imagine them—and to what ends. In the process, we will consider what we ourselves might learn from this complex, fraught, appealing, and possibly dangerous figure. Our “life lessons” from the samurai will include (among others), “How to be a spectacular failure,” “How to face the consequences of your actions,” “How to justify your existence,” “How to get revenge,” and “How to make your brand go global.”

LITERAL LOOKING: WHAT WE SEE IN ART
Peter J. Burgard (Department of Germanic Languages and Literatures)

**Freshman Seminar 31Q** 4 credits (spring term)  
**Enrollment:** Limited to 12

*Note:* The seminar meets in the Art Study Center of the Harvard Art Museums, where original works of art pertinent to those we are studying will be displayed in the seminar room for our examination and discussion. There will also be one trip to the Museum of Fine Arts in Boston, which will entail one Wednesday on which you will have to be available from 2–6 PM.

What do we really see when we look at a work of art? If we have little experience, we may not get far beyond discerning the theme and ascertaining whether the work is an accurate representation of reality (in the case of representational art); confronted with abstract art, seeing the work may result primarily in confusion or frustrated musing over what the point is. If we have too much experience—the seminar will address what “too much experience” might be and how literal looking relates to it—we may see the work as a function of historical, religious, aesthetic, mythological, and other concerns, or we may get caught in the web of a work’s iconography. Either way, our too little or too great experience can prevent us from seeing what is there. This seminar is an exercise in seeing what is actually there in a series of great works of art, in moving beyond too much mystification yet staying this side of too much sophistication, an exercise in
evaluating composition and representation as they present themselves to the viewer directly and without context. We will spend most of our time looking and talking about what we think we see, what we actually see, and how it informs interpretation, but we will also read short texts where professionally encumbered lookers (i.e., experts) say what we should see, so that we can compare the two and explore the degree to which literal looking aids or is aided by contextually informed looking. Works by Raphael, Caravaggio, Bernini, Velázquez, Turner, Renoir, Sargent, Klimt, Schiele, Kandinsky, Warhol, Richter.

**MAKING THE GRADE? MIDDLE AND HIGH SCHOOL MATH EDUCATION IN THE U.S.**

Robin Gottlieb (Department of Mathematics)

Freshman Seminar 40P  
4 credits (fall term)  
Enrollment: Limited to 12

*Note: This is not a mathematics seminar and has no prerequisites. A special invitation is extended to students not planning to concentrate in math.*

What are the goals of mathematics education at the middle and high school level, and how do these goals impact our evaluation of the success or failure of math education in America? Why does math education at these levels matter? What societal structures (historic, economic, political, cultural) impact mathematics education? How does math education in turn impact societal structures? We will also investigate differences in math education across different venues, both in the U.S. and internationally. As the world changes, how do the goals of mathematics education change, and in what ways? Readings in preparation for weekly discussions will include a combination of newspaper articles, articles by experts in the field and findings of large-scale national and international studies. This will help us make sense of the debate in the press, inside the mathematics and math education communities, and amongst policymakers about the state of mathematics education and what should be done about it. Students are expected to be active participants in seminar discussions. On occasion, students will (in pairs or small groups) be responsible for reporting out on different points of view and will debate issues from the perspective of a particular viewpoint (not necessarily their own) before staking out their own perspectives.

**MEASUREMENTS OF THE MIND: THE CREATION AND CRITIQUE OF THE PSYCHOLOGICAL TEST**

Marla D. Eby (Harvard Medical School)

Freshman Seminar 49N  
4 credits (fall term)  
Enrollment: Limited to 12

This seminar will introduce students to the history of psychological tests, both from the point of view of the psychologists using them and the people tested. We will examine the creativity within psychology in the making of such tests, as well as the drawbacks and dangers of the (mis)uses of these instruments. The seminar will explore tests in current use, as well as tests contained in various Harvard archives of psychological tests. We will discuss the issue of how psychological tests are perceived by and presented to the public, paying particular attention to recent museum exhibitions and films in this area. Students will also engage in a project of designing their own psychological tests.
FRESHMAN SEMINAR PROGRAM

MEDIA IN AMERICAN POLITICS
Matthew A. Baum (Harvard Kennedy School)

Freshman Seminar 41R  4 credits (fall term)  Enrollment: Limited to 12

This seminar considers the degree to which Americans’ political opinions and actions are influenced by the media as well as the influence of the media on public policy. Topics to be covered include the history of the mass media, recent trends in the media, theories of media effects, the implications for politics of changes in media (e.g., the rise of the Internet, social media and partisan media), the ways in which the news shapes the public’s perceptions of the political world, campaign communication, how the media affect the manner in which public officials govern, and the general role of the media in the democratic process.

MODELS OF THE WORLD: EXPLAINING THE PAST AND PREDICTING THE FUTURE
Nina Zipser (Department of Mathematics)

Freshman Seminar 51H  4 credits (fall term)  Enrollment: Limited to 12

**Prerequisites:** High school-level algebra and geometry. No knowledge of model-building is required.

This freshman seminar explains the concept and practice of social and natural science modeling. The seminar will address four fundamental questions: (1) What is a model? (2) How are models related to data? (3) How are models used to explain and predict events in the world, including counterfactuals (i.e., what would happen if we conducted military campaigns differently)? (4) How do models evolve over time? The seminar answers these questions with numerous case studies from the fields of astronomy, biology, computer science, economics, mathematics, physics, psychology, and statistics. For example, we’ll see that natural science models have (unintentionally) challenged fundamental social and religious beliefs, like the geocentric view of the universe and the origin of species. We’ll also show how models have been used to measure social phenomena, like discrimination and the pursuit of instant gratification. We’ll also explore the origins and trajectory of a new class of powerful, data-driven models that are emerging in the field of machine learning.

*It’s designed to ease you into the type of work that may be required later in your time at Harvard [...]. On top of that, you’ll be able to do things that even other students might not have access to. This includes gaining access to museum storage and 3-D educational models.*
MODERN CIVILIZATION AND THE RISE OF HEART DISEASE
Richard T. Lee (Department of Stem Cell and Regenerative Biology [FAS] and Harvard Medical School)

Freshman Seminar 21H 4 credits (fall term)  Enrollment: Limited to 12

Heart diseases have plagued humans since ancient times, but only in the past century has heart disease become epidemic throughout the world. Despite great progress in prevention and therapy, heart diseases will be major causes of death and disability throughout the next century. Modernization of civilization has played a major role in the rise of heart disease. Conversely, advances in heart disease have powerfully changed society and our personal daily behavior. In this seminar, we will examine some of the major intersection events between heart disease and modern society over the past century and consider how this could change the next century in America and throughout the world. The topics include dramatic events like a young physician inserting a urinary drainage tube into his heart—ultimately generating the modern life-saving treatment for heart attacks. We will explore how major lifestyle factors such as tobacco, alcohol, exercise and diet affect health, and how economics and politics often play a role in the complex relationship of health and society. In addition, we will visit a high-technology modern cardiology facility and watch some technology in action.

MONEY MATTERS
Evridiki Georganteli (Department of History of Art and Architecture)

Freshman Seminar 36X 4 credits (fall term)  Enrollment: Limited to 15

Money Matters aims to engage first-year students with the economics, politics and aesthetics of one of the most fascinating and enduring aspects in human history. The seminar is a study of money in all its manifestations from the early agrarian societies to the first financial crisis of the twenty-first-century global market. How have individuals and societies reacted to and used money in business, politics and religion? What are the factors that shaped the metallic content and iconography of coins from the seventh century BCE to the end of the Gold Standard in the twentieth century? Why are early modern American and European banknotes so important for the study of social history? What are the links between art, literature, theatre, cinema and money? Seminar meetings will take place at Harvard College, the Harvard Carpenter Center for the Visual Arts and the Harvard Art Museums, introducing students to the world-class Harvard Coin Collection and offering them the opportunity to handle research and discuss priceless artifacts. Money Matters is intended for students with an interest in history, art history, archaeology, political science, economics and the study of world religions. Handling sessions, group discussions and a short essay on a choice coin from the Harvard Coin Collections will offer students a sense of immediacy and accessibility of Harvard’s splendid numismatic holdings and the opportunity to understand why money makes indeed the world go round.
MORALITY, LEADERSHIP, AND GRAY-AREA DECISIONS
Joseph L. Badaracco, Jr. (Harvard Business School)

Freshman Seminar 70K  4 credits (fall term) Enrollment: Limited to 12

Everyone with serious responsibilities, at work and throughout their lives, faces gray area decisions. In organizations, these highly uncertain, high-stakes decisions are delegated upward, to men and women in leadership positions. They have to make final decisions on these problems, despite the gray, and these decisions test their competence and their humanity. This seminar offers a variety of important perspectives on gray-area problems and on ways to resolve them, responsibly and effectively. The seminar begins by examining gray area problems in various professions and lines of work. Subsequent sessions focus on three different ways of resolving gray area problems—in terms of accountability, character, and action. A typical session of the seminar will draw upon classic works of fiction, basic ideas in moral philosophy, and contemporary situations. These situations are typically described in short case studies involving men and women early in their careers, and they give students in the seminar the opportunity to grapple with these problems in personal terms—by discussing what they would do in these situations. From time to time, students will write short papers, which will be discussed in the seminar.

MUSLIM VOICES IN CONTEMPORARY WORLD LITERATURES
Ali S. Asani (Committee on the Study of Religion)

Freshman Seminar 37Y  4 credits (fall term) Enrollment: Limited to 12

This seminar will explore the range of issues that face contemporary Muslim societies through the perspective of short stories, novels, and poems written by Muslim authors from different parts of the world. Issues to be examined will include: the impact of colonialism, nationalism, and globalization; the politicization of Islam; the emergence of terrorism in the name of religion; the status of women and gender relations; attitudes towards the West and Western culture; the interaction between religion, race, and ethnicity; and the search for an “authentic” Islamic identity in the context of modernity. Readings will consist of Muslim authors from the Middle East, sub-Saharan Africa, South Asia, and the West (Europe and America). No prior knowledge of Islam is assumed. Assignments include compiling a portfolio of creative responses to the weekly readings using different media.

This was the best class I have ever taken. Of all of my classes this semester, this was the one which I truly enjoyed the coursework and looked forward to every week. Taking this course has been one of the greatest academic decisions of my life.
MY GENES AND CANCER  
Giovanni Parmigiani (Harvard T.H. Chan School of Public Health)

**Recommended Preparation:** There are no strict prerequisites, though some familiarity with the basic concepts of probability and genetics will be very helpful.

The role of a person’s genetic background in determining whether he or she will develop cancer, and when, is at the center of public discussions and active scientific investigations. Already, one’s genetic background is used in making life-altering health decision aimed at preventing the occurrence of cancer, as was recently the case with actor Angelina Jolie. This seminar will explore the extent to which current scientific knowledge can inform this type of decision. The goals is to gain enough understanding of the scientific background to critically evaluate the discourse of a genetic counseling session. The seminar will proceed at first by laying essential foundations of genetic inheritance in humans, cancer evolutionary theories, statistical risk, and decision-making in health care. Subsequently students will read articles from the scientific and popular press, and listen to podcasts. In class we will discuss the readings. There is a good deal of reading and listening, which everyone is expected to do ahead of class. Students can expect readings in genetics and statistics that will stretch them, though it will not always be necessary to understand all the technical details of every paper. Students can also expect to read opinion pieces with which they (as well as I) may disagree. Students will be required to present summaries of the assigned readings, and lead class discussions. They will also be required to write one 5-page double spaced essay at the end of the class, and to lead a class discussion on the topic of their papers. A typical paper is the critique of a scientific or popular press article, chosen from a list of suggested options or identified independently by the student, with my approval, during the first seven weeks of class. Attendance is essential, not only for the students’ education, but for the benefit their contributions provide to the others.

The instructors were passionate about the topic and so were all of the students. This common interest created an environment where learning was both enjoyable and impactful [...and] nurtured conversation because students felt more comfortable/eager to participate.
NIETZSCHE
Mathias Risse (Harvard Kennedy School)

Friedrich Nietzsche addresses some of the big questions of human existence in a profoundly searching but often disturbing manner that continues to resonate with many. Hardly any philosopher (except Karl Marx) has exercised such a far-reaching and penetrating impact on intellectual life in the last 150 years or so. He has influenced thinkers and activists across the political spectrum. Nietzsche has always been of special interest to young people who have often appreciated the irreverence and freshness of his thought, as well as the often very high literary quality of his writing. In this seminar, we explore Nietzsche’s moral and political philosophy with emphasis on the themes he develops in his best-known and most accessible work, *The Genealogy of Morality*. The best-known themes from this book include the slave rebellion in morality, ressentiment, bad conscience, and ascetic ideals. However, we also read several other of Nietzsche’s works, and do so chronologically (except that we begin with his auto-biography, *Ecce Homo*, which Nietzsche wrote briefly before his mental collapses in 1889). The other works include *The Birth of Tragedy*, *The Gay Science*, *Beyond Good and Evil*, and *The Antichrist*. We do not read any secondary literature, though the instructor will recommend such literature as appropriate. The point is to become familiar with Nietzsche’s writings themselves and to engage with his thought.

THE ORIGINS OF THE HUMAN MIND
Susan E. Carey (Department of Psychology)

The adult human mind is a unique phenomenon on earth. Only people can ponder the causes of and cures for global warming or pancreatic cancer, and can think thoughts about molecules, genes, democracy... Animals, and human infants, do not have most of the 500,000 concepts expressed by words in English. How does the human mind work, and how can we understand how it came to be, with its vast repertoire of concepts from which we routinely compose thoughts? In this seminar, we will explore together the origins and development of human knowledge in the individual child, in relation to two larger time scales: biological evolution and historical/cultural development. We will begin with several case studies, including case studies of the origin of the concepts *natural number* and *living being*. Each case study illustrates how all of the disciplines within the cognitive sciences, as well as anthropological, archaeological and historical disciplines, shed light on these issues. The main focus will be on experimental work from psychology. We will then turn to case studies chosen by the participants in the seminar. By the end, seminar students will have a grasp of the theoretical debates about the nature of the human mind that have animated philosophy since the time of the Greek philosophers, as well as why considerations of the origins of the mind were always seen as central to these debates. Students taking this seminar should have an interest in learning about the cognitive sciences, which draw primarily from linguistics, analytic philosophy, computer science, and experimental psychology.
THE PHYSICS AND APPLIED PHYSICS FRESHMAN RESEARCH LABORATORY

Jene A. Golovchenko (Department of Physics and Harvard John A. Paulson School of Engineering and Applied Sciences)

Freshman Seminar 24E 4 credits (fall term)  Enrollment: Limited to 12

Prerequisites: The seminar will be accessible to students with an interest in science/engineering and who currently play a musical instrument, at least at an elementary level.

This year’s freshman seminar will enable students with musical training to bridge this knowledge with Physics, Mathematics, software and hardware via experimentation with sound and music. Teams will be guided by faculty, staff and a practicing software entrepreneur.

PHYSICS AND PHOTOGRAPHY

Peter S. Pershan (Harvard John A. Paulson School of Engineering and Applied Sciences)

Freshman Seminar 51G 4 credits (fall term)  Enrollment: Limited to 12

Prerequisites: Ideally, students should have had a good high school physics course; however, individuals who are motivated to understand the science of photography should not have a problem with the material taught in the seminar. Similarly, students should feel comfortable with high school algebra and trigonometry.

Note: Arrangements for loaned cameras will be made for those who do not own one. Photographs taken by the members of the seminar will be discussed in class.

The practice by which the 3-dimensional world is projected onto a 2-dimensional surface dates to at least the 30,000-year-old cave drawings; however, it is only in the last two centuries that taking pictures has made it possible to easily create the images that consume so much of our social networks. The seminar will cover both the history of how photography developed from the early nineteenth century to today along with the science that made this possible. Topics to be discussed include classical optics, the quantum mechanics on which digital technology is based, the computer software for editing your images, the basics of how our eyes process color and the way color is reproduced in printing and electronic displays. The surprising behavior of our eyes is often the basis of many optical illusions. Some of the weekly homework assignments will involve photographic exercises designed to illustrate the use of camera controls such as f/#, shutter speed, focal length zoom choices, white balance and ISO (sensitivity) settings. Other assignments will involve image editing.

My relationship with a faculty member which began in a freshman seminar, continued in an independent study, and concluded in her supervising my thesis.
**PHYSICS, MATH AND PUZZLES**
Cumrun Vafa (Department of Physics)

*Freshman Seminar 23P*  
4 credits (spring term)  
Enrollment: Limited to 15

**Prerequisite:** This seminar is recommended for students with a strong background in both math and physics and with keen interest in the relation between the two subjects.

Physics is a highly developed branch of science with a broad range of applications. Despite the complexity of the universe the fundamental laws of physics are rather simple, if viewed properly. This seminar will focus on intuitive as well as mathematical underpinnings of some of the fundamental laws of nature. The seminar will use mathematical puzzles to introduce the basic features of physical laws. Main aspects discussed include the role of symmetries as well as the power of modern math, including abstract ideas in topology, in unraveling the mysteries of the universe. Examples are drawn from diverse areas of physics including string theory. The issue of why the universe is so big, as well as its potential explanation is also discussed.

**POLITICAL LEGITIMACY AND RESISTANCE: WHAT HAPPENED IN MONTAIGNE’S LIBRARY ON THE NIGHT OF OCTOBER 23, 1587, AND WHY SHOULD POLITICAL PHILOSOPHERS CARE?**
Arthur I. Applbaum (Harvard Kennedy School)

*Freshman Seminar 48K*  
4 credits (fall term)  
Enrollment: Limited to 12

**Note:** All required reading will be in English.

After Henri of Navarre’s brilliant defeat of a Catholic army at the Battle of Coutras, the presumptive but contested Protestant heir to the French throne spent the night at the chateau of Michel de Montaigne, the great essayist and political advisor. Navarre then baffled expectations by not pressing his military advantage—he instead journeyed to visit Corisande, his mistress and Montaigne’s friend—even though the resistance theory of Navarre’s closest advisor, the young diplomat Philippe du Plessis-Mornay, would have justified a decisive campaign. By withdrawing his army from the field and not further challenging the authority of his cousin, King Henri III, Navarre failed to end the Eighth War of Religion, but may thereby have won his crown as Henri IV. Did Montaigne persuade Navarre to withdraw? What was his argument? Was Mornay with Navarre and Montaigne that night? What would Mornay have argued? The seminar will explore the theories of political legitimacy and justified resistance to authority developed by the persecuted Protestants of the day, and trace the influence of these ideas about political obligation and religious conscience on some of the major figures in modern political philosophy from Hobbes to Kant. Students should be prepared to engage in both historical detective work and philosophical reflection.
POlitical Philosophy in Swift’S Gulliver’S Travels
Harvey C. Mansfield (Department of Government)

Freshman Seminar 71H  4 credits (fall term)  Enrollment: Limited to 12

Jonathan Swift was a great writer and one of the funniest men who ever lived. But he was also a great thinker, as this seminar proposes to show. His comedy leads him to the baser side of human life and to flagrant indecencies about shameful things. Why are humans ashamed of themselves? Why do they need to have their dignity recognized? Another aspect of Gulliver’s Travels is its politics. Gulliver visits four imaginary regimes and compares them—a study of comparative government. What is the best regime, and why is Gulliver dissatisfied wherever he goes? In one of the regimes is an academy of scientific researchers, mocked by Swift. How can modern science reconcile its materialism with the dignity of humans? What is the compatibility of science and the humanities? To these three themes of the seminar, all of them still timely for us, one must add a view of Swift’s matchless satire and irony. Is his comic imagination mere idiosyncratic exaggeration, or is there truth in it?

Power Shifts: Understanding Global Change through History
O. Arne Westad (Harvard Kennedy School)

Freshman Seminar 71J  4 credits (fall term)  Enrollment: Limited to 12

Nobody can understand the present without a keen understanding of the past. Even though the study of history has value in itself, it is also something that can help us make sense of today’s world. Successful people often understand this and turn a view of the past to their advantage in interpreting the present. They understand how any good plan is grounded in a sound view of history. This seminar will discuss major shifts in history from European and Asian antiquity up to today. It looks at power in all its dimensions—material, demographic, technological, ideological, military, or religious—and shows how it has influenced and been influenced by major transformations in global history. Our aim is to discuss the key causes of power shifts, but also to get an impression of the fickleness of established orders in times of tectonic change. The class reading will center on a number of brief historical cases developed at the Harvard Kennedy School. They range from ancient Greece, China, and Arabia up to the Iraq war and U.S.-China relations today. Through these cases we want to discuss dimensions of power and how they shift over time. We also want to look at how leaders have initiated, steered, or responded to power shifts. The purpose of the cases is to illuminate how people in the past have reacted to major change and how their choices may help us understand the tools and options that are at our disposal when making critical decisions.

It was amazing to take a small course like this with one of the preeminent scholars in the world on this subject guiding our reading and discussion.
PREDICTING LIFE AND DEATH—QUANTITATIVE APPROACHES TO HUMAN HEALTH AND DISEASE
Franziska Michor (Department of Stem Cell and Regenerative Biology [FAS] and Harvard T. H. Chan School of Public Health)

Freshman Seminar 51D  4 credits (spring term)  Enrollment: Limited to 12

Prerequisites: There are no prerequisites for this seminar.

Note: There will be a required field trip to the Dana Farber Cancer Institute Radiation Oncology Clinic.

How long does each of us have to live? How does this expectation depend on the extent of exercise, stress, and lifestyle choices such as a love of burgers or long-term smoking? If we are diagnosed with cancer or cardiovascular disease, how many years do we lose, and how does that depend on where we live and how much we earn? Given that millions of people are diagnosed with disease each year, is that data publicly accessible, and is it sufficient to infer the lifespan of an individual patient? Do I want to know how long I have left to live? Can someone else deduce my identity by me being part of a database for lifespan prediction? Do I care if my identity and lifestyle choices become publicly known if it is for the greater good of learning more about preventing disease? How do doctors decide on treatment plans and what can we learn from visiting a radiation oncology clinic where terminal patients are being treated? And finally, how can we use emerging datasets in innovative ways to learn about human health and disease?

PREDICTION: FROM ANCIENT OMENS TO MODERN COMPUTER SIMULATIONS
Alyssa A. Goodman (Department of Astronomy)

Freshman Seminar 27J  4 credits (fall term)  Enrollment: Limited to 12

We will discuss the variety of approaches humans have taken to predicting their own future. Early weeks will focus on omens, oracles, religion and prophecy. Next, we will move on to the so-called Scientific Revolution, exemplified by the work of Galileo, and the Age of Exploration, enabled by John Harrison’s solution to finding longitude at sea. The last several weeks of the seminar will focus predictive work in epidemiology, finance, and climate, and ultimately on work about the Universe’s future. The final session will be a discussion of how computer models of health/wealth/climate combine to predict our future. Preparatory assignments will include readings and/or multimedia experiences relevant to the next week’s topic. Between meetings, students will be asked to make contributions to a seminar WordPress site, sometimes as answers to specific prompts (e.g., discuss a way in which Galileo’s predictions of Jupiter’s moons’ orbits might have affected Renaissance ideas about determinism vs. free will?), and other times as links to and explanations of online (open multimedia) content that will enrich the (public) seminar record. A central goal in discussions will be to follow threads, such as finding the right level of skepticism when assessing the likely veracity of predictions, or considering sources of uncertainty, that connect the wide variety of predictive systems to be discussed. The seminar will offer one field trip, to Harvard’s Collection of Historical Scientific Instruments.
THE PROBLEM OF EVIL AND THE NATURE OF HUMAN FREEDOM
Courtney Bickel Lamberth (Committee on the Study of Religion)

Freshman Seminar 34C 4 credits (spring term)  Enrollment: Limited to 12

Common sense seems to confirm the reality of evil. From the genocides of the twentieth century to the homicides that fill our daily news, evil seems to be a category of ordinary language and experience. But what do we really mean when we use the word “evil” to describe a person, an action or an historical event? Does it have an “essence?” Why does the word pack an emotional punch that other terms do not? The term “evil” seems to point to an incomprehensible quality that marks the limits of human understanding and control. Theologians, philosophers and poets have long struggled with these limits, drawing on their deepest imaginative powers in writing about the meaning and consequences of evil. This seminar will consider key texts in Western philosophy, theology and other literary forms that have sought to frame the question and offer readers avenues for responding to the problem of evil. We begin with Greek (selections from Plato’s dialogues and Sophocles’ Antigone), Hebrew (The Book of Job, Genesis), and Christian (Paul’s Letter to the Romans and Augustine’s Confessions) sources that were pivotal in framing the problem of “theodicy” in western thought: how God can be understood as good, wise and all-powerful, given the fact that innocent people suffer. We then turn to three authors who shaped modern approaches to the problem of evil by locating the question increasingly on the nature of human freedom.

PSYCHOLOGY OF RELIGION
J. Wesley Boyd (Harvard Medical School)

Freshman Seminar 43M 4 credits (fall term)  Enrollment: Limited to 12

This seminar will address some of the fundamental questions about the nature of the self, issues that appear at the intersection of religion and psychology: Where do we turn, if anywhere, for ultimate meaning? What happens when individuals undergo some sort of crisis and radically change their belief system or how they engage with the world? How do we face death? An underlying assumption of the seminar is that no individual or society can thrive without resting on a fundamental value system or symbol-system that provides some kind of orientation to the cosmos. The seminar will therefore explicitly address the ways in which both individuals and cultures create frameworks of meaning—religion being a basic one for many—and the limits of those frameworks. The seminar will also explore the complexities raised by those who might not be able to create such systems of meaning for themselves (such as those with certain mental illnesses) and those who might be unwilling or unable to abide by or live within culturally established norms. The readings explore philosophical, psychological, and literary perspectives on these questions and issues and will include works by Freud, Dostoevsky, William James, Flannery O’Connor, Malcolm X, and others.
Quantum mechanics was discovered in the early twentieth century in experiments involving single electrons and photons, such as the emission and absorption of light by a gas of hydrogen atoms. The quantum theory introduced a revolutionary new perspective on the nature of physical reality, replacing the powerful classical paradigms of Newtonian mechanics. Indeed, some of the most remarkable implications of the quantum theory have only become clear in the past few decades, and it is likely that more surprises will appear in the future. The fundamental new idea introduced by quantum theory is that of “superposition.” This has no counterpart in Newtonian mechanics, and allows a particle (an electron, or even atoms and molecules) to be in a superposition of states at two or more distinct locations. When extended to multi-particle systems, a corollary of superposition is that of “entanglement:” this allows measurements of two or more particles to be correlated with each other even though they may be separated by large distances. The objective of the seminar will be to describe how entanglement can be used as a resource to perform tasks that are not possible classically. We will begin by discussing the basic structure of quantum mechanics using the concept of a “qubit.” The simplest protocols for quantum cryptography and quantum teleportation will be described, followed by an introduction to quantum computing and quantum error correction. Ideas on “anyons” will lead to a discussion of topologically protected quantum computing.

Reading the Novella: Form and Suspense in Short Fiction
Jonathan H. Bolton (Department of Slavic Languages and Literatures)
Freshman Seminar 61U  4 credits (fall term)  Enrollment: Limited to 12

Short enough to read in a single sitting, but more complex and absorbing than short stories, novellas give us some of our most intense reading experiences. Indeed, many of the enduring classics of world literature, from Melville’s Benito Cereno to Tolstoy’s The Death of Ivan Ilich, take advantage of the novella’s compression and acceleration of plot—features that are also suited to horror, mystery, and other forms of “genre” fiction. In this seminar, we will read some of the great masters of the novella form, including Henry James, Leo Tolstoy, Thomas Mann, Alice Munro, Katherine Anne Porter, and James Joyce, as well as other examples from around the world, including Eastern Europe, China, and Japan. Readings of 50–125 pages a week (all of it in English) will allow us to work closely with some classics of modern fiction, going down to the level of word choice and sentence structure, but we’ll also consider the way authors build and sustain suspense,
the different forms of narrative resolution, and other questions of plotting and structure. We will also talk about how to get the most out of your weekly reading experiences—I’ll ask you to set aside solitary time for your reading each week and, as far as possible, to read each novella in just one or two sittings. You’ll keep a reading journal, including 2–3 pages of unstructured writing each week; a number of short papers, including creative assignments, will help you understand the choices made by authors as they shape their stories for this most demanding and exciting of fictional forms.

READING TOLSTOY’S WAR AND PEACE
Julie A. Buckler (Department of Slavic Languages and Literatures)

Freshman Seminar 37P  4 credits (spring term)  Enrollment: Limited to 12

Leo Tolstoy’s massive masterwork War and Peace (1865–69) is a magnificent work of art by a world-class writer tackling life’s “big questions.” It is also a great read! Over the course of a semester, we will give this nineteenth-century novel the time and attention it deserves. We will read War and Peace closely, while comparing two different English-language translations, exploring cultural and historical context, artistic biography, historiography, the novel as a literary form, literary language, issues in translation, interpretive paradigms, and potential new ways of reading. We will trace the changing interpretative approaches to War and Peace from the 1860s to the present. How does the pacing of the novel relate to nineteenth-century reading and publishing practices? To nineteenth-century conceptions of time, space, narrative, and genre? What are the problematic distinctions between history and literature that the novel raises? We will also consider the significance of the Napoleonic wars (1803–1815) in Russian history and the broader pan-European cultural legacy of this period, including literature, art, and architecture.
REGULATING ONLINE CONDUCT: SPEECH, PRIVACY, AND THE USE AND SHARING OF CONTENT
Christopher T. Bavitz (Harvard Law School)

Freshman Seminar 70Z  4 credits (fall term)  Enrollment: Limited to 12

In the course of a few short decades, the Internet has become integral to significant swaths of human experience. It has radically altered modes of interpersonal engagement, democratized access to tools of mass communication, and changed the role of gatekeepers that traditionally controlled access to music, video, and other media. Given the breadth of its impact, it is not surprising that the Internet has pushed the bounds of legal doctrines that govern speech, privacy, and the creation and exploitation of content. Mass-scale online distribution of copyrighted works tests the limits of legal doctrines developed in an era of physical copies. Age-old tensions between privacy and the right to free expression have been exacerbated in cases where one’s right to speak bumps up against the desire of another to keep information private. And the ability to share—and, thus, to consume—extraordinary amounts of personal data has impacted government (which collects and uses data for purposes of law enforcement) and private companies (which collect and use data for purposes of advertising and monetization). This seminar will provide an overview of legal doctrines that govern the online conduct of individuals and institutional actors. It will address the rights and responsibilities of the intermediaries that mediate many of our online activities—social networks, cloud-based storage services, email providers, and the like. Students will consider old and new legal frameworks and the ways in which the law informs strategic decisions for those that operate online. The seminar will address some of the most important and complex policy debates of our day—regarding the proper scope of intellectual property protection, the balance between a robust environment for online free expression and a desire to protect against harmful speech, and the ways in which the law addresses privacy vis-à-vis both government and private actors. Readings and in-class conversations will cover legal cases and case studies, offering students a high-level view of the technical, legal, and business landscape and allowing them to delve deeply into particularly difficult sets of problems concerning the regulation of online conduct.

RESEARCH AT THE HARVARD FOREST—GLOBAL CHANGE ECOLOGY: FORESTS, ECOSYSTEM FUNCTION, AND THE FUTURE
David R. Foster (Department of Organismic and Evolutionary Biology)

Freshman Seminar 21W  4 credits (spring term)  Enrollment: Limited to 11

Note: The seminar consists of four weekend-long field trips (Friday evening–Sunday) to the Harvard Forest, dates TBA. Transportation, accommodations, and meals at the Harvard Forest will be provided at no cost to the student.

Global change ecology is the line of scientific inquiry that integrates the responses of organisms, ecosystems, and their environments with changes in human activity and climate. This seminar will focus on state-of-the-art research, tools, and measurements used in evaluating and anticipating global change through ongoing studies at the Harvard Forest’s 3,500-acre outdoor laboratory in Petersham, MA. Students will explore the key role that forests play in climate control and develop the necessary skills to present and discuss the ecological evidence for past and future
The seminar consists of four weekend-long field trips (Friday evening–Sunday) to the Harvard Forest, where students will visit various long-term ecological experiments, use long-term and real-time datasets to understand biosphere-atmosphere interactions, and discuss key scientific findings. The seminar will highlight integrated faculty studies of land-use history, forest dynamics, atmospheric exchange of carbon and water, plant phenology, invasive plants and pests, and the impacts of climatic warming on complex ecosystems. Transportation, accommodations, and meals at the Harvard Forest will be provided. A final, on-campus mini-symposium will give students an opportunity to present what they have learned in a public forum.

THE RISE AND FALL OF THE MACHINE: TECHNOLOGY AND ITS CRITICS

Jill M. Lepore (Department of History)

Freshman Seminar 62G 4 credits (fall term) Enrollment: Limited to 12

Note: There will be a required trip to Walden Pond by train on Saturday, 9/15/18.

This freshman seminar investigates the history of six modern machines—the train, the camera, the radio, the mainframe computer, the personal computer, and the Internet—to trace shifting ideas about the relationship between technology and progress. Machines like these do a lot of things: they document the world; they advance scientific research; they make goods cheaper; they accelerate transportation and communication; they produce knowledge and diffuse information. Do they make the world a better place? Boosters and critics have debated this question since the Enlightenment. This hands-on seminar, in which we’ll grapple with the machines themselves, using Harvard’s Collection of Historical Scientific Instruments (CHSI) and the MIT Museum, asks students to wrestle with one of the most urgent and fundamental questions of the twenty-first century: What is the end of innovation? Students from all backgrounds are welcome, from engineers to artists. The chief work of the seminar is reading, listening, and watching: we’ll read essays, watch films, and listen to broadcasts. You’ll be asked to provide a response to each week’s materials before each seminar meeting. Another piece of work for this seminar is making: your final project will be either A) a machine of your own design (you could either build it or submit plans for it) or B) a product manufactured by a machine that we have studied (e.g., you could make a film or a podcast). Either way, you’ll also submit an essay, explaining how your machine or product makes the world a better place.
THE ROLE OF GOVERNMENT
Oliver D. Hart (Department of Economics)

Freshman Seminar 42C  4 credits (spring term)  Enrollment: Limited to 12

Economists have a very positive view of the role of markets. The intellectual foundations of this are the first and second theorems of welfare economics. The purpose of the seminar is to introduce the students to these results but also to their limitations. For example, for markets to work well it is essential to have a legal system that upholds contracts and protects property rights. The legal system is also important to deter crime. But who can provide the legal system other than a government that has the coercive power to raise taxes? The legal system is an example of a public good, but of course there are many others including national defense, clean air, etc. Markets under-provide public goods and they also do not work well in the presence of externalities, a highly topical example of which is global warming resulting from carbon emissions. Another very topical issue is inequality. There is no particular reason to think that a market economy will yield an equitable distribution of income, and given this what is the appropriate government response? Throughout the seminar the analysis of ideas and concepts will be interspersed with policy issues such as whether and what limitations should be placed on the right to smoke or consume drugs, the right to marry, the right to buy and sell organs, the right to bear arms, and the freedom of businesses to decide whom to serve. We will also consider the pros and cons of the Affordable Care Act (Obamacare), the role of government nudges, and whether goods or services paid for by the government need to be produced by the government or can be outsourced: the issue of privatization.

SCIENCE IN THE AGE OF ARTIFICIAL INTELLIGENCE
Brendan J. Meade (Department of Earth & Planetary Sciences)

Freshman Seminar 51C  4 credits (fall term)  Enrollment: Limited to 12

Prerequisites: High school calculus and/or computer programming would be extremely useful.

Science is focused on discovering and explaining the world around and within us. This has been its goal for hundreds of years and has produced astonishing breakthroughs from population genetics, to general relativity, to plate tectonics. Artificial intelligence (AI) is touted as a tool for learning about a complex system in ways that humans can’t and has seen exceptional progress in natural language processing and image identification. In this class we explore the emerging linkages between scientific inquiry and artificial intelligence. The central goal of this class is to question the classical role of the scientist as a creator of theories and consider how scientists may become interpreters of theories developed by AI. We do this by developing an understanding of how AI systems actually work (they’re astonishingly simple), explain recent success cases, and then consider how we may (or may not) rebuild science in an AI-first manner. Examples will be drawn from the earth and planetary sciences as well as the life sciences.
THE SCIENTIFIC METHOD: A ROADMAP TO KNOWLEDGE
Robert Sackstein (Harvard Medical School)

Freshman Seminar 23E  4 credits (fall term)  Enrollment: Limited to 12

The nineteenth-century British biologist Thomas H. Huxley stated that “Science is organized common sense where many a beautiful theory was killed by an ugly fact.” But how does one practice such organized common sense? More fundamentally, the “ugly fact” must be rigorously validated: How does one judge the appropriateness of a given scientific approach and the reliability of the findings so derived? Scientific enquiry is guided by a process called the scientific method, grounded in hypothesis generation and practical experimentation yielding objective measurement(s) and reproducible findings; this process involves presumption and observation, at the convergence of deductive and inductive logic. A firm understanding of this method is fundamental to scientific pursuits, but non-scientists should also gain understanding in order to appreciate the scope and limitations of particular scientific findings and participate in contemporary scientific debates. Through historical and contemporary readings, this seminar will provide a practical framework to understand application(s) of the scientific method: students in the seminar will become proficient in evaluating the logic in experimental design requisite to address relevant hypotheses, will gain fundamental skills in the analysis and interpretation of experimentally derived data, and will develop firsthand appreciation of the excitement in paradigm shifting scientific discovery. Whether or not a student will decide to pursue a career in a science-related field, the skill set in logic and critical reading imparted by this seminar will broaden the capacity to reason and interpret concepts in any discipline and will be applicable to all non-academic pursuits.

SEA MONSTERS
Peter R. Girguis (Department of Organismic and Evolutionary Biology)

Freshman Seminar 50V  4 credits (spring term)  Enrollment: Limited to 12

Note: Required field trips related to the sea are included. There will be no cost to the student.

There have always been tales of sea monsters. For as long as we humans have ventured into the ocean, our imaginations have conjured images of serpents, krakens, leviathans, and other creatures, all of whom seem bent on the destruction of those who dare set foot into the sea. Humankind’s conviction that sea monsters are real is so powerful that—even today—rumors abound of sea monsters lurking in the depths. Indeed, every major religion—Eastern and Western—features sea monsters. Are these declarations true? Do giants roam the deep sea? Did the explorers of centuries ago see creatures from their small wooden boats that we do not see today? During this seminar we will explore sea monsters through a social, spiritual, literary, and scientific “lens.” We will study the sea monsters that flourish on ancient maps to understand the minds of sixteenth-century scholars. We will examine the bodies of real sea monsters, and consider the world in which such grotesque creatures might evolve. We will busy ourselves with tales of creatures from classic and contemporary literature. Most importantly, we will develop a better understanding of how humans perceive the world, and how our consciousness can simultaneously embrace our wildest dreams and cower from our greatest fears. Sea monsters, both real and imagined, tell us much about life in the deep sea, and even more about humankind.
THE SEVEN SINS OF MEMORY
Daniel L. Schacter (Department of Psychology)

Freshman Seminar 23S  4 credits (fall term)  Enrollment: Limited to 12

How do we remember and why do we forget? Can we trust our memories? How is memory affected by misinformation such as “fake news”? Do smartphones and the Internet help our memories or hurt them? Are traumatic experiences especially well remembered or are they poorly remembered? What are the best ways to study for exams? This seminar will address these and other questions related to the fallibility of memory by considering evidence from studies of healthy people with normal memories, brain-damaged patients who show dramatic forgetting or striking memory distortions, and neuroimaging studies that reveal brain regions and networks that are linked to memory. The framework for the seminar is provided by the idea that the misdeeds of memory can be classified into seven basic “sins.” Three of the memory sins refer to different kinds of forgetting (transience, absent-mindedness, and blocking), three refer to different kinds of distortions or false memories (misattribution, suggestibility, and bias) and the final sin refers to intrusive recollections (persistence). We will consider how the memory sins impact everyday life and discuss the possibility that they can be conceptualized as by-products of adaptive features of memory, rather than as flaws in the system or blunders made by Mother Nature during evolution. Relatedly, we will also discuss the interplay between remembering past experiences and imagining future experiences, which provides clues regarding the nature and fallibility of memory.

SILK ROAD STORIES
Mark C. Elliott (Department of East Asian Languages and Civilizations and of History)

Freshman Seminar 61M  4 credits (fall term)  Enrollment: Limited to 12

Note: Students are required to participate in two class excursions, one to the Harvard Art Museums and another to the Museums’ storage facilities in Somerville. There will also be two required evening film screenings.

“The Silk Road”—the words conjure up images of camel caravans crossing vast deserts or traversing lofty mountains with their precious cargoes of textiles and porcelain. From ancient Chinese emissaries and intrepid Buddhist pilgrims to plucky Venetians, swashbuckling Swedes, and adventurous Americans, the Silk Road has produced countless storytellers with enchanting accounts of “East meets West.” What do we really know about the Silk Road, though? What if it turns out that much of what we believe about the Silk Road turns out to be a myth? This seminar invites you to embark on your own Silk Road journey, exploring the material and historical reality behind the fabled Eurasian trade routes and the ways in which different Silk Road narratives serve today both as political capital and artistic inspiration. In the process, we will come to understand the peculiar biology of Bombyx mori, get hands-on experience in the Harvard museum collections, and study attitudes toward cultural patrimony.
SKEPTICISM AND KNOWLEDGE
Catherine Z. Elgin (Harvard Graduate School of Education)

Freshman Seminar 31J 4 credits (fall term) Enrollment: Limited to 12

What can we know and how can we know it? Skeptics argue that knowledge is impossible. Some non-skeptics dismiss skeptical arguments as idle. But the motivation for Descartes’ Meditations is his realization that, although he had received the best education in the world, much of what he had learned turned out to be false. This led him to embark on a systematic investigation to discover whether knowledge is possible. Harvard freshmen face a similar predicament. Having dutifully learned what they were taught, and evidently learned it well, some find themselves questioning its cognitive adequacy. Much that they learned in school seems superficial, incomplete, oversimplified, or incorrect. Is it possible to know the way the world is? Can I know that I am not a brain in a vat being manipulated into thinking that I am an embodied human being? Can I know that the Louisiana Purchase occurred in 1803, that electrons have negative charge, that Hamlet is a masterpiece, that the sun will rise tomorrow? In this seminar we will study skeptical arguments and responses to skepticism. The goal is to discover the nature and scope of knowledge. Students write a one-page response paper each week and three five-page papers during the term. Each student will be expected to introduce the material to be discussed at one meeting of the seminar.

SKIN, OUR LARGEST, HOTTEST, AND COOLEST ORGAN:
FROM CANCER TO COSMETICS
David E. Fisher (Harvard Medical School)

Freshman Seminar 51M 4 credits (fall term) Enrollment: Limited to 12

Prerequisites: None. Prior AP-Biology may be helpful but not required.

Skin provides a protective barrier that is vital to survival of all multicellular organisms. Its physical properties have been exploited for centuries, from clothing to footballs, and yet skin is a vibrant and dynamic organ that responds to environmental signals in myriad ways. Skin protects humans from toxic exposures, but can also be an intrinsic source of dangerous diseases. While its defects only rarely kill humans, its imperfections can cause misery and discomfort, ranging from subtle annoyances to depression and loss of self-esteem. It is a source of immense pleasure or excruciating pain. This seminar will provide a series of exposures at an introductory level to distinct topics in skin biology. They will exemplify the diverse and vibrant nature of cutaneous networks and signals, through the lens of commonly recognized topics such as tanning, hair, sweat, cosmetics, cancer, and infections.
SOCCER AND GLOBALIZATION IN LATIN AMERICA
Bruno M. Carvalho (Department of Romance Languages and Literatures)

Freshman Seminar 62E  4 credits (spring term)  Enrollment: Limited to 12

What can we learn about globalization and Latin America through the prism of soccer? Soccer may be the global game, but it sometimes contradicts the patterns of globalization. Latin America, although peripheral to the geopolitical order, plays an oversized role in the sport. A prominent filmmaker once claimed that there were two types of soccer: “European teams were prose, tough, premeditated, systematic, collective,” while Latin American ones were “poetry, ductile, spontaneous, individual, erotic.” However outdated those notions, Latin American identities have sometimes been conflated with the performances of Latin American soccer players. In this seminar we will explore relationships between the region and the world by examining historical, cultural, political and aesthetic dimensions of the game. We will examine how soccer captivates the imagination of so many, viewing its popularization in the context of developments in stadium construction, mass media, and capitalism, as well as in light of the legacies of slavery and European migration. Readings draw from various fields such as philosophy, political science, and journalism. We will analyze literature, photography and film, including narratives that elevate soccer to “epic” status. In the process, we will discuss the uses of soccer during authoritarian regimes, as well as its more liberating potentials. Reflections over the place of soccer in changing global and local landscapes will invite questions of how, amid deep economic inequalities, the sport might function both as the proverbial “opium of the masses” and as a powerful congregator.

SOUNDTRACKING
Christopher Hasty (Department of Music)

Freshman Seminar 35C  4 credits (spring term)  Enrollment: Limited to 10

Note: The ability to read musical notation is not a pre-requisite.

This seminar will offer a critical, close-reading approach and a creative art-making approach to exploring ways of combining sound and moving image. The first few weeks will involve analysis and discussion of uses of music/sound in excerpts from a variety of movies and TV series episodes and mastering skills for working with Pro Tools, a digital audio workstation system that can incorporate video. As skills with Pro Tools develop emphasis will shift to composition exercises that experiment with combining sound and image. Since all students will be given the same assignments we will have the opportunity of testing and discussing various solutions. The seminar will accept students with and without compositional training and the ability to notate music. Sound will be composed in various ways, many of which will not involve conventional music notation. All students will learn to use high quality field recorders to gather sound materials that can then be sculpted with Pro Tools. The final project will be the production of a sound track to an assigned short film (5–10 minutes) and a public screening.
THE STORY OF THE ALTERNATING SIGN MATRIX CONJECTURE
Lauren K. Williams (Department of Mathematics)

Freshman Seminar 51E 4 credits (fall term)  Enrollment: Limited to 12

Prerequisites: This seminar is recommended for students with a strong background in mathematics. Some exposure to combinatorics and linear algebra is helpful, but not required.

This seminar is intended to illustrate how research in mathematics actually progresses, using recent examples from the field of algebraic combinatorics. We will learn about the story of the search for and discovery of a proof of a formula conjectured by Mills-Robbins-Rumsey in the early 1980s: the number of n x n alternating sign matrices. Alternating sign matrices are a curious family of mathematical objects, generalizing permutation matrices, which arise from an algorithm for evaluating determinants discovered by Charles Dodgson (better known as Lewis Carroll). They also have an interpretation as two-dimensional arrangements of water molecules, and are known in statistical physics as square ice.

Although it was soon widely believed that the Mills-Robbins-Rumsey conjecture was true, the proof was elusive. Researchers working on this problem made connections to invariant theory, partitions, symmetric functions, and the six-vertex model of statistical mechanics. Finally in 1995, all these ingredients were brought together when Zeilberger and subsequently Kuperberg gave two proofs of the conjecture. In this seminar we will survey the story of the alternating sign matrix conjecture. If time permits, we will also get a glimpse of very recent activity in the field, for example the Razumov-Stroganov conjecture.

THE SUPREME COURT IN U.S. HISTORY
Richard H. Fallon, Jr. (Harvard Law School)

Freshman Seminar 40I 4 credits (fall term)  Enrollment: Limited to 15

The Supreme Court of the United States has often been described as the world’s most powerful court. But the Court has not always enjoyed high prestige or unquestioned authority. During the early years of U.S. history, its role was uncertain, its authority precarious. Since then, the Court’s significance has waxed and occasionally waned, with the variations typically depending on surrounding currents in the nation’s social and political history. This seminar will examine the history of the Supreme Court from the nation’s founding to the present day. Main subjects of concern will involve the relation between constitutional law and ordinary politics, and the ways in which they influence one another. Readings for the seminar will include books and articles by historians, political scientists, and legal scholars, as well as selected Supreme Court opinions.
TALKING ANIMALS
W. James Simpson (Department of English)

When literary writers think about social organization, hunger, violence, sex, suffering, technology, expressivity, and education (for example), they often draw upon animal behavior to understand human practice. They think with animals. Occasionally that thinking prompts awareness of the otherness of animal behavior, and the reality of animal suffering. For the most part, however, recourse to animals is a way of thinking about human behavior. It’s also a way of persuading humans to act differently. Animals present us to ourselves in exaggerated form, whether as cute, as clever, as beautiful, or as terrifyingly violent and relentlessly rapacious. Animals address all human ages: cute animals appeal to children, beautiful animals (especially birds) to young lovers, whereas the violent and rapacious animal stories are reserved for the grown-ups. Either way—cute, beautiful or terrifying—we need animals to think, no doubt because we are ourselves animals, even if we often pretend not to be. This seminar will focus on extraordinarily brilliant animal literature (funny, mordant, touching, sophisticated), across literary genres destined for different age groups (children, adolescents, adults), in European literature, from the last 2,000 years. You will be encouraged to build your own bibliography, with your own animal story finds in the Harvard library system.

TECHNOLOGY VS. NATURE: FROM TOGGING HARPOONS TO GEOENGINEERING
David W. Keith (Harvard John A. Paulson School of Engineering and Applied Sciences and Harvard Kennedy School)

Are we at the end of nature? What would it mean if we were? Advanced hunting technologies enabled our ancestors to hunt so efficiently that the human expansion out of Africa drove a wave of extinctions around the globe. No more mammoths. No more moas. Over the last millennia, technological innovation has dramatically reduced many environmental impacts on a per capita basis; but, technology simultaneously enabled a population explosion and caused new forms of environmental disruption. Technology is simultaneously a despoiler and savior of the environment. We will explore the shifting frontier between the natural and artificial through critical examination of globally transformative technologies such as climate geoengineering, Haber-Bosh nitrogen fixation, gene-drives and de-extinction. Solar geoengineering is the idea that humanity could deliberately intervene in the Earth’s climate to limit the risks of accumulating carbon dioxide. It’s the focus of my own
research. It serves as the central motivating case though which the class will explore broader questions about environmentalism in the twenty-first century. We will read selections from great environmental writings such as *The End of Nature* and *Desert Solitaire* along with new writing about the Anthropocene. I aim to help students find their own voice through writing short informal blog posts, commenting on posts by peers, and participating in class debate. The human connection to the natural world cannot be rightly understood in the abstract. So, we will take the class outside, from short explorations on campus, to an organized day-hike.

**THE TEMPORAL UNIVERSE**  
Jonathan E. Grindlay (Department of Astronomy)

**Freshman Seminar 50I  4 credits (fall term)  Enrollment: Limited to 12**

*Note: This seminar is open to all but may be of particular interest to those considering Astronomy, Physics or Engineering concentrations.*

The Universe is not static, but rather stars and entire galaxies are evolving as revealed by their variability on timescales ranging from milliseconds for collapsed stars (neutron stars and black holes) to gigayears for stars and galaxies. In this seminar we shall explore stars and nuclei of galaxies through variability—from how brightness variability of stars with binary companions measured with small telescopes measures star masses and radii, to the extremes of variability of stars that undergo repeated huge flares, to enormously luminous variations from accretion onto gargantuan black holes in the nuclei of “Active Galaxies” (blazars and quasars). We shall use the Clay Telescope on the Science Center roof to make some repeated observations (from the 8th floor Astronomy Lab) of several types of variable stars and accretion-powered binaries and deduce what life would be like if either were our Sun. From a blazar, we shall observe historical outbursts that occasionally change brightness to exceed its host galaxy by a factor of ~100, by using the digitized brightness measures on thousands of glass plate images taken by Harvard telescopes from 1885–1992 and now digitized and on-line from our digital access to a Sky Century @ Harvard (DASCH) project. The seminar will include readings from an introductory astronomy text as well as both popular and journal articles and the short books *Black Hole* (Bartusiak) and *Black Hole Blues* (Levin). Students will use astronomical software to measure stellar brightness and variability from telescope images as well as learn temporal analysis techniques with applications to other disciplines. Students discuss in-class readings and observations conducted and write short papers on their observations and deductions.

*It was amazing to take a small course like this with one of the preeminent scholars in the world on this subject guiding our reading and discussion.*
THINKING ABOUT HISTORY IN A POST-TRUTH WORLD
Sidney Chalhoub (Department of History and of African and African American Studies)

Freshman Seminar 71I  4 credits (spring term)  Enrollment: Limited to 12

We live in a world of polarized, post-truth politics. Blatant lies are major components of public discourse. It seems that the phenomenon is global, accompanied by a resurgence of hate politics, expressed, for example, in the strengthening of racism worldwide. Words appear to have lost the prestige of referring to facts or interpretations presented in good faith and based on discourses of proof which, however contested, meant the recognition of a certain shared terrain of disputation. History as a form of knowledge has been affected by the current situation, with historians often accused of embracing political causes rather than rendering objective knowledge. What went wrong? Under pressure, historians tend to think historically (sic!)—that is, they seek to understand the trajectory of a problem and to explain change over time. History can help us to gain perspective on events. This seminar is an attempt to tell a history of thinking about history from the Enlightenment to the present, through the reading of some key texts and authors. The idea is to show that disputes about the meaning of history and the value of historical knowledge have often been quite intense without resulting in a world of epistemological dystopia and political dysfunction. Some of the questions to be discussed are: What is a historical fact? Whose history should historians tell? Is there progress in history? What is historical change and how to explain it? We will also discuss key concepts deployed by historians today, such as class, gender, and race.

THINKING ABOUT RACE AND THE LAW IN AMERICAN HISTORY: LIBERAL AND CRITICAL PERSPECTIVES
Kenneth W. Mack (Harvard Law School)

Freshman Seminar 62Q  4 credits (spring term)  Enrollment: Limited to 12

What is race? What is law? What does law have to do with race and racial inequality? We talk about these kinds of questions all the time when we discuss familiar cultural touchstones as the Brown v. Board of Education decision, the legacy of slavery and Jim Crow, and topics such as the Black Lives Matter movement. In this seminar, we will examine the role law has played throughout American history in creating racial categories, maintaining and eliminating racial hierarchy, and policing the borders between race and other classifications such as gender, sexuality and ethnicity. The civil rights movement taught mainstream Americans that law could be a tool to remedy past sins and made the promise of equality real for all citizens. In recent years, however, this conception of law and its role in the world has been criticized from many quarters, and many of those doubts have coalesced into a field now known as Critical Race Theory. In this seminar, we will bring the long-running dialogue between liberal and critical approaches to race and the law up to the present day. Which approach, or combination of approaches—liberal or critical—best describes our present circumstances? Which would seem to describe a more realistic view our future? Which provides the tools that we might need to grapple most productively with that future? These are some of the questions we will explore in the seminar.
TRIALS FROM CLASSICAL ATHENS AND MODERN LEGAL DEBATES
Adriaan M. Lanni (Harvard Law School)

Freshman Seminar 31P 4 credits (spring term) Enrollment: Limited to 12

Prerequisites: Prior knowledge of ancient history or ancient languages is not required; all readings are in translation and the seminar is designed to be of interest to those without a background in the ancient world.

In classical Athens, litigants represented themselves before hundreds of jurors who rendered verdicts without instruction from a judge. We will evaluate Athens’ distinctively amateur legal system by reading surviving court speeches involving homicide, assault, adultery, international law, and commerce as well as Plato’s account of Socrates’ defense speech. We will analyze the speeches as pieces of legal rhetoric and for the insight they offer into ancient approaches to crime and punishment, the regulation of sexuality, the trial jury, and court procedure. Taught by a law professor, the focus will be on comparing ancient and modern approaches to problems faced by all legal systems. We will use the ancient material as a jumping off point to debate modern legal topics such as the role of victims in the criminal process, jury nullification, the proper exercise of discretion in prosecution and sentencing, the provocation doctrine in modern homicide law, transitional justice institutions (human rights prosecutions, amnesties, truth commissions); theories of punishment, the use of collective sanctions in international law, free speech and the protection of dissent in a democratic society, and direct vs. representative models of democracy. Approximately half of each class session will be devoted to discussing the Athenian cases, the other half to discussing analogs in modern legal debates.

TRYING SOCRATES IN THE AGE OF TRUMP
Russell E. Jones (Department of Philosophy)

Freshman Seminar 61D 4 credits (spring term) Enrollment: Limited to 12

We find ourselves in the middle of fierce political debates. Should the common folk have political power, or should it be concentrated in the hands of an elite? Is our national interest best served by looking inward and directing our resources toward local concerns, or by thinking globally about both threats and opportunities? How do we balance concerns for economic growth, humanistic understanding, religious freedom, and scientific advancement? Our answers to such questions are enormously consequential, and even people of good will can find themselves in heated disagreement, labeling opponents as the enemy and striving to drive them and their ideas from the public square. The Athenians of 2,400 years ago didn’t conduct their political battles with tweets and hacks and super PACs, but they would easily recognize our battles as versions of their own, fought over much the same ground. At a particularly heated time, they used the lethal power of the courts to silence Socrates, one of their own. Our task is forensic. We’ll assemble the available evidence to determine why the Athenians killed Socrates. His views were complex—certainly he doesn’t align neatly with any of our own major political parties, and he’s difficult to categorize even in the context of ancient Athens. So what was so offensive or threatening about him as to provoke such extreme measures? Once we’ve assembled our evidence, we’ll formally try Socrates in absentia for ourselves. Was he guilty? And what should be done with people who spread dangerous ideas?
THE U.S. ENERGY POLICY AND CLIMATE CHANGE
James H. Stock (Department of Economics)

Freshman Seminar 42H 4 credits (fall term) Enrollment: Limited to 12

How we produce and use energy has major implications for the economy, energy security, and climate change. The U.S. “energy revolution”—nonconventional oil and gas production (fracking), increasing use of renewable energy, and reduced demand—has contributed to a sharp decline in U.S. oil imports, a 12% reduction in U.S. carbon dioxide emissions, a shift away from coal, and economic growth. With these technological and economic changes have come wild swings in national climate policy, as Obama-era regulatory and subsidy policies designed to shift from fossil fuels to renewables are replaced by the Trump administration with policies to promote and subsidize fossil fuel use and production. The conceptual framework is economics (but no prior economics is assumed), a powerful tool for understanding market failures and for designing government policies that are efficient, effective, and appropriate. The seminar starts with a review of the U.S. energy sector, climate science, and climate economics including carbon pricing. The seminar then dives into four current policy issues: (1) the regulation of CO2 emissions from fossil-fuel fired power plants; (2) biofuels policy; (3) fossil fuel extraction policy and the “keep it in the ground” movement; and (4) fuel economy standards. In each case we will evaluate the policy landscape with a focus on the economic and climate consequences. The seminar concludes with an assessment of the reasons for the changes from the Obama to Trump administrations, and the implications for future energy and climate policy.

THE UNIVERSE’S HIDDEN DIMENSIONS
Lisa Randall (Department of Physics)

Freshman Seminar 26J 4 credits (spring term) Enrollment: Limited to 12

This seminar will give an overview and introduction to modern physics. As with the book, Warped Passages, on which it will be loosely based, the seminar will first consider the revolutionary developments of the early twentieth century: quantum mechanics and general relativity; and then it will investigate the key concepts which separated these developments from the physical theories which previously existed. We will then delve into modern particle physics and how theory and experiment culminated in the “Standard Model of particle physics,” which physicists use today. Then we will move beyond the Standard Model into more speculative arenas, including supersymmetry, string theory, and theories of extra dimensions of space. We will consider the motivations underlying these theories, their current status, and how we might hope to test some of the underlying ideas in the near future.
UNDERSTANDING THE SEEMINGLY IMPOSSIBLE: 
A REVOLUTION IN BIOLOGY
Craig P. Hunter (Department of Molecular and Cellular Biology)

Occasionally a scientific discovery is so unexpected that it is seemingly unexplainable. This seminar will revisit one such event, the discovery of RNA interference and how modern experimental molecular genetics cracked this “problem” and started a billion-dollar industry. Rare unexpected discoveries in biology, for example catalytic RNAs, instantly extend and broaden our understanding of the world, while the impact of other discoveries (split genes, hopping genes) are more gradual. However, some discoveries challenge firmly supported ideas. The initial description of RNA interference (RNAi) was seemingly magical—the introduction of a RNA molecule matching the sequence of any gene, results in the effective silencing (turning off) of the gene. Further, the silencing signal(s) were extremely potent and mobile, moving between cells, tissues, and generations. A series of seminal discoveries during an amazing four-year period revealed the previously unimagined process. We will read and talk about how these discoveries were made and how this unexpected new biology launched new therapeutic companies and is informing developing ideas about heritability, adaptation, and evolution.

VOYAGES: EXTRAORDINARY AND WONDROUS JOURNEYS 
THROUGH THIS AND OTHER WORLDS
Josiah Blackmore (Department of Romance Languages and Literatures)

Note: There will be mandatory field trips to Harvard’s Houghton Library and the Harvard Art Museums.

Together we will go on journeys over land, over sea, and into the deepest reaches of the human imagination. Great artistic works and big ideas will carry us through vast expanses of time and space. We will think about how the voyage is a fundamental aspect of the human condition, how travel to and through familiar, exotic, and otherworldly places raises basic questions about humanity, the possibilities of knowledge and imagining, and the interdisciplinary nature of our own minds. Our seminar will contemplate how people make sense of themselves, their histories, and the world around them. By contemplating voyage narratives of the commonplace and the fantastical, the visionary and the terrifying, the monstrous and the familiar, we will scrutinize how travel may occur in time, space, and speculative and supernatural worlds, and how some journeys happen as we sit still. The seminar encourages participants to cultivate their own curiosity as well as a capacious vision of the world, a culture of debate, and a love of ideas. We will see how stories of various kinds of journeys rest at the heart of the humanities on a truly global scale. A few questions that will guide our collective study of voyages are: what is the relationship between reason and passion? Between lived experience, storytelling, and self-reflection? How might we appreciate cultural difference without abandoning a notion of essential human values? Finally, the seminar seeks to open ways for students to enrich not only their future studies but also their lives.
WAR IN FICTION AND FILM
Justin M. Weir (Department of Slavic Languages and Literatures and of Comparative Literature)

Freshman Seminar 62P  4 credits (fall term)  Enrollment: Limited to 15

Prerequisites: There are no prerequisites for the seminar. The seminar is designed for a general audience. Literary and/or media studies backgrounds are not required, nor is the material presented in a way that requires any special knowledge of military history. All texts originally written or filmed in languages other than English will be provided in translation or with subtitles.

War has always been one of the most important subjects of art and literature, but in the twentieth and twenty-first centuries, public ideas about war and military service have been formed increasingly by film and other visual media. In this seminar we will consider the different ways war has been depicted in literature and in films. We will spend some time identifying the conventions and clichés of the genre, and we will have occasion to discuss depictions of war in news coverage, documentaries, and video games. But we will mainly be reading and viewing several masterpieces—including novels and stories by Leo Tolstoy, Isaac Babel, Ernest Hemingway, Kurt Vonnegut, Cormac McCarthy, Tim O’Brien, and Phil Klay, and films by directors Jean Renoir, Stanley Kubrick, Francis Ford Coppola, Stephen Spielberg, Terrence Malick, and Kathryn Bigelow. In our discussions, we will reflect on how these largely fictional narratives of war have shaped our understanding of culture, politics, and history.

WHAT IS BEAUTY?
Francesco Erspamer (Department of Romance Languages and Literatures)

Freshman Seminar 35E  4 credits (fall term)  Enrollment: Limited to 15

Of the three fundamental concepts of Western civilization—truth, goodness, and beauty—beauty is the only one that does not demand loyalty or consistency. One moment we are entirely absorbed by a person or an object, the next moment we find it insignificant. Beauty does not promise or imply the possibility of verification, not even in a distant future—there will be no comprehensive research and no day of reckoning to finally prove that Leonardo’s Mona Lisa or Beethoven’s Ninth Symphony are in fact beautiful. But perhaps this is precisely the reason why we need beauty, and why it is worth studying: it teaches the contingency of values and the revocability of absolutes; it is a most effective training for tolerance and innovation. Selections from Plato, Kant, and other Western classics of aesthetics will be discussed in the first part of the seminar. In the second part we will explore the representation of beauty in literature, art, opera, cinema, and design, with examples mostly taken from the culture of a country, Italy, that successfully self-fashioned itself as the land of beauty. Topics will include the Renaissance “invention” of art, Mozart’s Don Giovanni, Fellini’s La Dolce Vita, and Benetton’s advertising campaigns.
WHAT IS LIFE?
Guido Guidotti (Department of Molecular and Cellular Biology)

Freshman Seminar 26Z  4 credits (fall term)  Enrollment: Limited to 15

This seminar will consider the conditions of a cell necessary to support life. The central questions are: what are the principal constituents of the cell, what is the role of water in cellular activities, what determines the size of a cell, what are the consequences of crowding of the components of the cell, what is the role of diffusion in biological interactions, what is the energy currency of the cell, what are the critical reactions that provide energy for the cell, how does the cell evade the requirement for an increase in entropy for a spontaneous process? The proposal is to find a definition for a living system using information and principles of biology, chemistry and physics. Answers to the central questions may allow an understanding of the size of prokaryotic and eukaryotic cells, of the ionic composition of the cell cytoplasm, and of the involvement of molecular interactions and complementarity in cellular processes.

WHEN BAD THINGS HAPPEN EARLY IN LIFE: THE EFFECTS OF EARLY ADVERSITY ON BRAIN AND BEHAVIORAL DEVELOPMENT
Charles A. Nelson (Harvard Medical School, Harvard T. H. Chan School of Public Health, and Harvard Graduate School of Education)

Freshman Seminar 43F  4 credits (fall term)  Enrollment: Limited to 15

Decades of research tell us that the foundations of healthy development are built early in life. Genes provide the basic blueprint for brain architecture, but experiences shape the activity of the genome and thus determine how the circuitry is wired. Significant adversity can derail developmental processes and distort brain maturation, leading to limited economic and social mobility. Exposure to significant adversity early in life, particularly during critical periods of brain development, may increase risk for a host of chronic physical health problems, including cardiovascular disease, hypertension, diabetes, and addictive behavior; it can also lead to a variety of mental health problems, including depression and anxiety and characterological problems. Science clearly indicates that the longer we wait to intervene on behalf of such children, the more difficult it becomes to achieve healthy outcomes. This constraint is particularly true for children who sustain the wear and tear of early exposure to so-called “toxic stress.” In this seminar we will critically examine the range of adverse early experiences that impact children growing up in both low and high resource countries. Key themes include a) the nature of the adversity children are exposed to, b) the timing of the adversity c) the chronicity of the adversity, and d) individual differences (including genetic and environmental factors that may confer protection on children exposed to early adversity). We will pay particular attention to the short- and long-term outcomes on physical, neurological and psychological health.
WHENCE THE LITTLE ICE AGE: AN INQUIRY INTO THE PENULTIMATE CLIMATE ANOMALY

Peter J. Huybers (Department of Earth and Planetary Sciences and Harvard John A. Paulson School of Engineering and Applied Sciences)

Freshman Seminar 51J  4 credits (spring term)  Enrollment: Limited to 12

Prerequisites: A background in math and physics and interest in human and natural history is recommended.

The relatively cooler surface temperatures that prevailed during the Little Ice Age, roughly between 1650–1850 A.D., are important to understand for their historical significance, as a baseline from which to understand modern changes, and as an opportunity to explore how and why the climate varies. There are three not-necessarily exclusive hypotheses for the Little Ice Age: volcanism, solar variability, and internal redistributions of heat. We will begin by familiarizing ourselves with the scientific literature related to these three hypotheses, and then turn to inquiring whether human and natural historical records can help distinguish amongst these various factors. As examples of human historical records, we will make use of daily temperature records kept by Harvard’s President Holyoke; depictions of ice, shadows, and vegetation in paintings; and the dates of flowering given in Henry Thoreau’s diaries. For natural records, we will explore tree ring and pollen records, geochemical indicators of sea surface temperatures, and records from ice cores. More broadly, we will seek to gain some appreciation of how societies adapted to and were influenced by the altered climate conditions of the Little Ice Age. This class is for students interested in conducting original climate research that draws upon physical science, data analysis, and history.
“WHERE ARE YOU FROM?” ANCESTRY IN THE AGE OF GENOMICS
David A. Haig (Department of Organismic and Evolutionary Biology)

Freshman Seminar 50D  4 credits (fall term)  Enrollment: Limited to 12

A human interest in ancestry and kinship is found in most cultures. This interest is not a construct of the modern age, but recent advances in genetics can now provide a wealth of previously unavailable information about our genetic descent. The seminar will discuss examples of what genetics can tell us about where we are from and address the kinds of questions genetics can answer and the kinds it cannot answer. What should we conclude when cultural tradition and genetics tell different stories? Are genetic answers relevant or irrelevant to competing cultural narratives of identity? Is the question “Where are you from?” an invitation to explore our common humanity amid diversity or is it a microaggression that constructs barriers between us?

WHO IS A FASCIST? CULTURE AND POLITICS ON THE RADICAL RIGHT
Jeffrey T. Schnapp (Department of Romance Languages and Literatures and of Comparative Literature)

Freshman Seminar 62O  4 credits (fall term)  Enrollment: Limited to 12

This seminar provides an in-depth introduction to fascism, its intellectual and political roots, its critique of liberal democracy and socialism, and the traces fascism has left on the contemporary cultural-political scene from Marine Le Pen’s Rassemblement National to the American alt-right to populist insurgencies like Trumpism. It begins with readings from key fascist thinkers and theorists, before surveying a series of domains where artists, writers, architects, film-makers, and engineers sought to interpret and embody the “fascist revolution” not just in Italy but worldwide. Among the figures considered are mystical nationalists like Gabriele D’Annunzio; Filippo Tommaso Marinetti, founder and leader of the Futurist movement; the American poet Ezra Pound, author of The Cantos, one of the masterpieces of twentieth century American poetry; Leni Riefenstahl, the film director of classic documentaries such as Olympia and Triumph of the Will; the architects Marcello Piacentini and Adolf Speer, the former Italy’s leading designer of public monuments and buildings during the Mussolini era, the latter Hitler’s preferred architect; and the engineer Gaetano Ciocca, creator of everything from Corporativist pig farms to mass-produced worker housing to mass sports stadia. Seminar themes will include: fascism vs. nazism; collectivism vs. individualism; radical right attitudes towards technology and industrialization; and examinations of the convergences and divergences between mid-twentieth century fascisms and the sub-cultures of today’s alt-right. The capstone project for the semester will involve an original research project focused on a contemporary alt-right group.
WHY DOES INJUSTICE PERSIST?
Bernhard Nickel (Department of Philosophy)

Freshman Seminar 62N  4 credits (spring term)  Enrollment: Limited to 12

A lot of people say the right things about justice, and yet injustice persists. Why? Perhaps people are disingenuous: they say out loud what others want to hear, but their actions are guided by a different set of beliefs. Perhaps people are divided within themselves: they sincerely believe in principles of justice, equality, and fairness, but their actions are driven by unconscious biases. Perhaps people are confused: they believe, at the most abstract level, that justice, equality, and fairness are important, but their views about what they require are distorted. Perhaps it doesn’t matter what any one of us wants to do: the way a society is organized depends on an overarching ideology, not what any one person thinks or does. Perhaps it doesn’t matter what any one of us wants to do: the way a society is organized depends on our institutions, not what any one person thinks or does. In this seminar, we’ll look at approaches that focus on each of these possible explanations as they concern racial justice. We’ll look at the strengths and weaknesses of each on its own terms, and whether the different approaches compete or complement each other. The seminar is an exercise in collaborative learning. The students in the class will contribute the examples we use to interrogate the different approaches and thereby shape our discussion.

ZEN AND THE ART OF LIVING: MAKING THE ORDINARY EXTRAORDINARY
James Robson (Department of East Asian Languages and Civilizations)

Freshman Seminar 71D  4 credits (fall term)  Enrollment: Limited to 12

Note: This seminar will also include required film screenings, visits to the Harvard Art Museums and Boston’s Museum of Fine Arts, and to the Cambridge Zen Center.

This seminar explores the rich history, philosophy and practices of Zen Buddhism as it developed in China, Korea, and Japan. We will first consider the emergence of the Zen tradition out of the Buddhist tradition and then explore the full range of its most distinctive features (Zen monastic meditation), cultural practices (painting, calligraphy, and poetry), and radical—even iconoclastic—innovations (such as the use of kōans, which are seemingly nonsensical sayings that defy rationality). We will also critically evaluate some less well-known facets of the Zen tradition, such as gender issues, the veneration of mummified masters, and the question of how Zen was implicated in modern nationalistic movements in Japan during World War II. During the mid-twentieth century, Zen became a global phenomenon as Zen masters began to move around the world and introduce the practice of Zen meditation to those in search of religious alternatives to Western organized religions, rationalism, and materialism. Zen attracted the attention of writers, musicians, artists, and athletes. Why did Zen develop such a trans-cultural appeal at that moment in history? Why are there so many books with the title: “Zen and the Art of . . .”? Why do so many computer and tech companies have Zen in their names? How has Zen meditation fed into the current “meditation/mindfulness” boom? These are some of the questions we will explore in this seminar through readings, film screenings, museum viewings, and a visit to a Zen meditation center.
Remo F. Airaldi, Lecturer on Theater, Dance and Media, 35N .................................................. 16
Joanna Aizenberg, Amy Smith Berylson Professor of Materials Science (SEAS) and Professor of Chemistry and Chemical Biology, 50U .......................................................... 20
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