Class of 2020,
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 149 Freshman Seminars that will be offered in 2016-17. As you will see, the range of seminars is spectacular: They offer you an exceptional introduction to every corner of the University, and 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 7 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.

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 his 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.

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.

The Freshman Seminar Program is amazingly unique, and I really appreciate the opportunity to look into something I wouldn’t have thought to study.
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.

The learning goes beyond the typical classroom setting as you discover other different environments for hands-on, interactive learning that are very enriching! You really get to see the readings come to life through the field trips!

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.

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 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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COVER:
Tommie Shelby and students discussing autobiography and black freedom struggles;
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GENERAL INFORMATION

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 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 Freshman Seminars may be submitted electronically through a Web-based system starting on Wednesday, August 3, 2016. Information about applying to fall-term seminars is available on the Freshman Seminar website (www.freshmanseminars.college.harvard.edu) or from the Freshman Seminar Office (617-495-1523). Applications will be accepted until 8:00 am on Friday, August 26, 2016, and students will be notified of their placement on Monday, August 29, 2016. 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 7 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.

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STUDY CARDS

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 study card day and your placement will be added to your study card by the registrar. If you add or change your seminar after this initial placement, you will need to request permission of the instructor in the My.Harvard portal to confirm your admission.**

For further information, please contact the Freshman Seminar 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 courses and meeting times can be viewed on our website at www.freshmanseminars.college.harvard.edu.**
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Frederick Millham (Harvard Medical School)

Freshman Seminar 24G  4 credits (fall term)  Enrollment: Limited to 15

The history of surgery begins with the Hippocratic physicians whose principles were based, at least partly, on observation and measurement. However, surgical thinking for the first three quarters of the “modern era” was dominated by Galen of Pergamum who, “fooled by his monkeys,” established a school thought as false as it was tightly held. The exposure of Galen’s errors by Vesalius in 1543 and Harvey in 1628 began a Medical Enlightenment. It would take until the 19th century for the next era of discovery to begin. During this time, the pace and significance of medical discovery increase, yet adoption of good ideas, like antisepsis, seems to take much too long, while bad ideas find adherents in spite of poor or no supporting evidence. Throughout this period, the ghost of Galen continues to haunt hospitals and battlefields. It will not be until the 1930s that Galenism is banished from the wards. Our study will track this history and conclude with a consideration of the management of combat casualties from the time of the first “modern” surgeon, Ambrose Pare, to that of contemporary forward surgical teams in Afghanistan and Iraq. This seminar will consist of weekly discussion, informed by assigned reading and independent inquiry. We will visit the site of the first use of ether anesthesia and duplicate William Harvey’s experiments in the anatomy lab. From time to time, we will be joined by other doctors with expertise in specific areas, such as infectious disease, combat surgery and anatomy.

THE ADVENTURES OF THEODORE ROOSEVELT
Michael Canfield (Department of Organismic and Evolutionary Biology)

Freshman Seminar 60I  4 credits (spring term)  Enrollment: Limited to 12

At heart, Theodore Roosevelt was an adventurer. At regular intervals throughout his life, he went to the field as a naturalist, hunter, rancher, soldier, conservationist and president. He chased grizzly bears and outlaws in the American West. He tracked lion and elephant in Africa. As a Harvard student, he followed birds in the Adirondacks to provide data for his first publication. Using Roosevelt’s original diaries, journals and notebooks that are housed in Houghton Library, this seminar encourages students to explore Roosevelt’s adventures through original documents and to understand how narratives about his life have been created from them. Some topics will focus our attention far afield in South America, in Africa and in the Caribbean. Other times, Roosevelt’s field notes will reveal rambles much closer to our meeting place in Houghton, such as his trips to Concord, and his time at his boarding house on Winthrop Street and at the Museum of Comparative Zoology. For the final project in the course, students will examine a one-week period in Roosevelt’s life when an adventure took place. They will collect a portfolio of primary documents that will then support an analytical paper that illuminates the historical context of that week. The course will meet in Houghton Library, and the curator of the Theodore Roosevelt Collection, Heather Cole, will be a regular participant in the activities of the course.
ADVICE TO YOUNG LEADERS
David Armitage (Department of History)

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

Many of the classic works of political and ethical theory in the Western tradition were written for young people about to enter public service or positions of authority. This seminar takes a selection of these major texts of advice and encouragement, among them works by Plato, Aristotle, Cicero, Machiavelli, Burke, James, Weber and Woolf. The class will introduce students to some major thinkers and ideas through a selection of texts that might speak to their own condition and ambitions. It will also show how to treat such works historically, in their own terms and their own contexts, while also applying them to current concerns and dilemmas. The overarching aim of the class will be for students to think rigorously about their own imminent responsibilities as citizens and leaders by reflecting on arguments addressed to similar rising generations in the past, in classical Greece, ancient Rome, early modern Europe, the 18th, 19th and early 20th centuries.

AFRO-CUBA: HISTORY, CULTURE AND CONFLICT
Alejandro de la Fuente (Department of African and African American Studies and of History)

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

Ninety-five percent of the Africans transported to the Americas from the 16th century to the 19th century did not come to the United States but went instead to Latin America and the Caribbean. African-based cultural forms are clearly visible in the religious, musical, dance, oral and community practices of numerous countries in Latin America. Through complex processes of creolization, filtering and incorporation, those cultural expressions have become icons of “national” cultures. From tango in Argentina to rumba in Cuba, from Brazilian Candomblé to Haitian Vodou, the Africans and their descendants have left indelible marks in the cultures of the region. How did this happen? How did the cultures of the enslaved Africans become national cultural symbols in Latin America? We explore these questions using the example of Cuba, which was, not counting Brazil, the last country to abolish slavery in the Americas (in 1886). The Afro-Cubans’ struggles for recognition and equality are inseparable from the conflicts surrounding the creation of Cuba as an independent nation, from United States efforts to control the island for most of the 20th century, and from the Cuban revolution of 1959. This seminar explores how Africans and their descendants have shaped the formation of a national culture in Cuba and how their contributions have frequently met with resistance and opposition. The seminar covers from colonial times to the present, but emphasis is placed on the cultural production of postrevolutionary and contemporary Cuba, including recent developments in the visual arts, music (especially Hip hop) and cinema.
ALL OF PHYSICS IN 13 DAYS
John M. Doyle (Department of Physics)

Freshman Seminar 23Y  4 credits (fall term)  Enrollment: Limited to 10

Prerequisite: Please note that this seminar will be geared toward students likely to go on into physics or related areas, such as chemistry/physics or engineering. The introduction to certain principles is done with the expectation that students will return to a more formal course on the subject in the future. This course acts as a kind of road map for further studies in physics. Topics may change.

Some claim that there are 13 ideas or principles that can form the bedrock for a pretty good understanding of our physical and technological world. These are: 1) Boltzmann factor and thermal equilibrium, 2) Turbulence, 3) Reaction rates, 4) Indistinguishable particles, 5) Quantum waves, 6) Linearity, 7) Entropy and information, 8) Discharges, ionization, 9) Relativity, 10) Nuclear binding energies, 11) Photon modes, 12) Diffraction, 13) Resonance. Each week we will discuss one of these principles and see how they explain certain things about the physical world. We will discuss their connections with other principles, as well as how the principle shows up in technology and, more broadly, in our technological society.

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

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

Prerequisite: High school science

Note: I especially invite 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 and what we have learned from them. 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 fill in 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 basic high school science. Many of the chapters describe other medical cases not as well-known as the classic cases described above, but instructive nevertheless.

As a freshman, you’re mostly taking courses that occur in lecture halls, but a seminar is usually capped at twelve 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.

— A FRESHMAN SEMINAR STUDENT
**THE AMERICAN DEATH PENALTY: MORALITY, LAW AND POLITICS**

Carol S. Steiker (Harvard Law School)

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

This seminar will address the controversies that swirl around the American death penalty in the distinct but related contexts of morality, law and politics. At the level of moral theory, we will consider whether the death penalty is ever justified as a state practice, both in the abstract and in application, given concerns about its fairness and efficacy in deterring crime. We will explore the U.S. Supreme Court’s “constitutionalization” of capital punishment, starting with its landmark decision in 1972 in the case of Furman v. Georgia. We will trace the Court’s attempt to deal with issues of fair process, proportionality, cruelty, reliability and racial discrimination. Close readings of key opinions will show how the Court’s interpretation of the majestic generalities of the Constitution—the guarantees of “due process,” “equal protection” and protection from “cruel and unusual punishments”—have been informed by moral theory. Finally, we will consider the American death penalty in political context, both nationally and internationally. We will assess explanations for the anomaly of American retention of capital punishment, alone among Western democracies. We will consider how moral philosophy and legal regulation have affected the course of the American death penalty in the political sphere and contemplate the legal and political future of the institution. Will (or can) the death penalty be reformed? What are the prospects for nationwide abolition (or large-scale resurgence)? Will (or should) the death penalty’s future lie in the hands of the courts or the political branches of government?

**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 that can help all of us better understand this one.
ANATOMY AND ETHICAL TRANSGRESSIONS IN NATIONAL SOCIALISM

Sabine Hildebrandt (Harvard Medical School)

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

This course introduces students to the history and ethics of anatomy, and their relevance for current questions in medicine concerning the human body in life and death. The story of anatomy in National Socialist (NS or Nazi) Germany is an example of ethical transgressions in the anatomical sciences and reveals the complex relationship between anatomists and the Nazi regime. The historic causes of this development will be explored by examining the roots of the biologicist NS ideology in the connections between anatomy, physical anthropology, the global eugenics movement and German racial hygiene. Many anatomists became members of the NS party, while others were persecuted for so-called “racial” and political reasons. An examination of the history of anatomical body procurement from ancient Greece to the 21st century demonstrates the changes of the traditional sources of bodies for anatomical dissection under NS rule, resulting in the use of many bodies of NS victims for anatomical purposes. Anatomical research changed with the exploitation of the rising number of bodies of executed men and women. Case studies of the work of individual anatomists reveal a gradual shift in the paradigm of anatomy. A few anatomists left the traditional paradigm—i.e., the gain of anatomical knowledge through work with the dead—in favor of a new paradigm—i.e., work with the “future dead”—in human experiments on prisoners who were subsequently murdered. Ultimately, anatomists became complicit with the government through their role in the complete destruction of the perceived “enemies” of the NS regime.

ANCIENT EAST ASIA: CONTESTED ARCHAEOLOGIES OF CHINA, KOREA AND JAPAN

Rowan Flad (Department of Anthropology)

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

What are the origins of the people, cultures and civilizations of East Asia, and how do we understand those origins? 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 rooted in a distant past for which our only evidence comes from the material remains left behind and studies by archaeologists. 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. In addition to learning about the major issues in Ancient East Asian archaeology, 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.
ANIMATION: GETTING YOUR HANDS ON TIME
Ruth S. Lingford (Department of Visual and Environmental Studies)

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

*Note:* No previous experience of drawing or animation is required. There will be an optional screening on Fridays from 1pm to 3pm that students are strongly encouraged to attend.

Students in this practice-based seminar will experiment with a variety of animation techniques to gain new perspectives on time. Using drawing, we will break down time into frames, understanding movement as both a liquid flow and a sequence of distinct infinitesimals. Using pixilation, a technique from the beginning of cinema, we will analyze and deconstruct human movement, then reassemble it for magical effect. Using strata-cut animation, we will attempt to think of time as a solid and visualize the progression of time in terms of volume and shape. Using editing software, we will explore cinematic constructions of time though the use of cutting and juxtaposition. Each session will include screenings, discussion and practical work. There will be practice-based assignments each week. Each student will have the opportunity to make a film of around one minute, using an animation technique of their choice. Or they may decide to collaborate with others to make a longer piece.

THE ART AND CRAFT OF ACTING
Remo 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, and so on. 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.

[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!
— A FRESHMAN SEMINAR STUDENT
THE ART OF NOTICING
Gordon Teskey (Department of English)

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

This is an advanced writing course on writing about poetry, music and art. The assumption of the course is that noticing is a mental discipline like any other and can be cultivated by good habits, exercises and practice. Noticing is also the one basic mental practice shared by the sciences and the humanities, and is indispensable to both. The word “aesthetics” is from the Greek word for “perception”—arguably interpretable as “noticing.” After the 18th century, aesthetics came to mean philosophical meditation on art. But in this course aesthetics means the art of noticing things one doesn’t normally see and deciding which of these things is important. We will be examining together in the classroom poems and works of visual art, and there will be outings to the Harvard Art Museums, the Museum of Natural History, as well as to the Boston Museum of Fine Arts and the Isabella Stewart Gardner Museum. Evaluation will be based on writing done in and out of class in a journal each student will be required to keep. Journals and papers will be turned in at the end of the class for a cumulative evaluation interview.

THE ART OF STORYTELLING
Deborah D. Foster (Committee on Theater, Dance, and Media)

Freshman Seminar 32V  4 credits (spring term)  Enrollment: Limited to 12

Throughout the centuries and across all continents, men and women have told stories to express the values they find in their common experiences of everyday life. While the multiple storytelling traditions of the teller influence the content and form of the emergent tale, each narrator shapes the story to reflect his or her own intentions, making it personally expressive as well as publicly meaningful to a particular audience in a specific place and time. Drawing on scholarship of oral storytelling traditions and reading (in translation) myths, tales, legends, plays and other forms from several traditions, this seminar will examine the nature of storytelling, its enduring appeal and its ability to adapt to multiple new platforms (stage, print, film, the Internet). Participants will engage in the storytelling process itself in order to understand better the interrelationship of structure, plot, character, imagery, rhythm, voice and gesture to the story as a whole in a variety of media, ranging from mime to video.
**THE ART, SCIENCE AND TECHNOLOGY OF GLASS**
David R. Clarke (Harvard John A. Paulson School of Engineering and Applied Sciences)

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

Glass is ubiquitous in our daily lives, so it may be easy to forget what a remarkable material it is. It allows the passage of light and yet sequesters heat. Able to be colored and shaped, glass has been used for millennia as an aesthetic medium, whether in jewelry, stained glass windows, such as in Memorial Hall, and in the modern glass sculpture of artists, such as Dale Chihuly. Glass has transformed the way we can view the world, through microscopes, telescopes or eyeglasses. Glass formed into fibers serves as the basis for modern telecommunications, and glass can play a role in solar-energy engineering. At a larger scale, glass is now also a substance for architectural expression. Glass is a material for all ages and all seasons, a material that can be plastic as well as brittle, a material that can be manufactured at the nanoscale and yet cast into sheets. Using a combination of readings, experimental exploration and discovery, students will have the opportunity to learn why glass is so unusual and how it has profoundly changed society in many ways. The basis for many of its unusual properties, as well as its ability to be formed into complex shapes, will be illustrated by experimenting on the origins of color, the dichotomy between its plasticity and brittleness, its optical properties, as well as its crystallization behavior. Many of these experiments also illustrate some of the essential elements of modern materials science and engineering. Each class will include readings describing the historical, artistic or scientific basis for the individual topics. Students will also undertake a research project culminating in a final, preferably video, presentation.

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

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

What is intelligence? An inquiry into the nature of intelligence can take different forms—philosophical, biological, mathematical or technological. In this 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. This seminar targets students who are interested in brains and computers in equal measure, and are comfortable with analytical thinking (logic, math, and so on).
ASTEROIDS AND COMETS
Charles R. Alcock (Department of Astronomy)

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

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 19th 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 the 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. Modern telescopes and spacecraft encounters provide us today 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. The students will observe with the Astronomy Laboratory’s Clay Telescope on the roof of the Science Center. Students will take on projects, which may involve their own observing program, or which 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 will provide 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, 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.
BEAUTY AND CHRISTIANITY
Robert J. Kiely (Department of English)

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

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*; 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 Matthew 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?

THE BEGINNINGS OF BUSINESS
Gojko Barjamovic (Department of Near Eastern Languages and Civilizations)
Eugene F. Soltes (Harvard Business School)

Freshman Seminar 60R  4 credits (spring term)  Enrollment: Limited to 12

Business as a way of life has existed for thousands of years. In *The Beginnings of Business*, we explore where many of the practices that we tend to take for granted today come from. What are the origins of money? What causes trade to occur and thrive? How has trust been built, and what are the ways in which people have sought to cheat (and avoid being cheated)? We’ll investigate these questions through the lens of multiple disciplines—archaeological and textual evidence from the ancient world, economics, history and anthropology. By understanding what was needed to create businesses in the past, we’ll be able to understand modern limitations that exist in the world today.
**BIOETHICS THROUGH FILM: AN EXPLORATION OF THE LAW AND ETHICS OF MEDICINE**  
I. Glenn Cohen (Harvard Law School)

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

Should animals have the rights of persons? What about very sophisticated robots? Is it ethical to run clinical trials in the developing world for drugs that will be unaffordable there? How far should we go in genetic screening and attempts to eradicate certain disabilities in our children? Is it wrong to buy and sell organs? Should the state be allowed to use neuroscience in the courtroom to convict or exculpate? In this seminar, we will examine these and other contemporary issues in bioethics using film and television paired with readings from law, philosophy, medicine and short story. Possible films/topics include (but are not limited to): *A.I.* (speciesism and the boundaries of legal and ethical personhood); *The Constant Gardener* (research ethics and running experimental drug trials in sub-Saharan Africa); *Gattaca* (genetic privacy and enhancement); *Dirty Pretty Things* (commodification and markets for organs); *Minority Report* (free will and criminal responsibility); *Never Let Me Go* (the ethics of creating children with disabilities), *The Surrogate* (sex and disability); *Eternal Sunshine of the Spotless Mind* (pharmacological interventions and the medicalization of happiness). This seminar is a good fit for students interested in these topics who are ready and willing to engage in discussions of hard questions and argue their positions. Some of the teaching will be Socratic (i.e., students will be called on to express their views to the class).

**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 medicines. As successful cancer management becomes more targeted with the newer therapies, there needs to be an integrative approach that focuses on clinical outcomes for patients, personalized approaches to individual cancers, and yet that 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 & 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-/phototaxis. 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 they 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, 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 course project based on a video-kinematic analysis of movement highlighting its biological, social or artistic significance; or by writing a final paper that examines in-depth some aspect of the biology of movement.

BIOLOGY 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

This course 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, for example, 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, such as mitochondria, which evolved from free-living bacteria 1 billion to 2 billion years ago. Further, the Human Microbiome Project emphasizes that “we are not alone.” Humans harbor 10 times 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 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 Strominger (Department of Physics)

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

Prerequisite: High school level calculus and physics

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 course will be discussion of weekly reading assignments and a final paper. Non-scientists are welcome.

BLOOD: FROM GORY TO GLORY
David T. Scadden (Department of Stem Cell and Regenerative Biology)

Freshman Seminar 26V  4 credits (fall term)  Enrollment: Limited to 10

Blood has long symbolized life and death, hope and horror, health and disease. Ritual places it rightly as representative of life itself. What it actually is as a substance depends on perspective. The course examines how blood, like many things we think we know, is different depending on context. Therefore, we examine how the ancients, literary and visual artists, the early experimentalists and current-day explorers bring us different ways of understanding blood. We discuss how blood is a magical substance, a commercial commodity and a paradigm for scientific understanding of stem cells and regeneration. We read Dracula, debate the values inherent in a free market of body components like blood, conduct the experiments that proved blood has stem cells and meet patients undergoing therapy for blood gone bad.
This seminar will examine Dylan as a musical, literary and general cultural phenomenon in the context of popular culture of the last 55 years, but also in the context of the much more long-lived poetic, literary and musical cultures of which he is demonstrably an important part. Dylan has been at the center of popular culture ever since he arrived in New York City on January 24, 1961, from Hibbing, Minnesota, by way of Minneapolis, Madison and Chicago. The seminar will trace the evolution of his songs and lyrics from its early folk, even-earlier rock and roll, gospel and protest roots, through the transition from acoustic to electric, also through the many evolutions, reinventions, and innovations that followed—and that continue to emerge. We will also focus on Dylan’s frustrations of audience expectation, from the anger evoked by his apparent abandonment of the serious protest and static urban folk traditions to his apparent embracing of Christianity to attacks focused on Dylan’s “plagiarism,” which show a lack of understanding of the vital and original literary process that expects the reader/listener to notice the thefts and reworkings. The seminar will also explore the multiple versions of many of Dylan’s songs that show him to be not unlike an oral poet in his ability to re-perform and recreate through performance, and in the process often transforming utterly the original lyrics and meanings of his own songs. Attention will be given to the ways in which Dylan’s career builds up through periods of evolution and experimentation to productions that can only be called “classics” from a diachronic perspective, among others \textit{Highway 61 Revisited} (1965), \textit{Blonde on Blonde} (1966), Blood on the Tracks (1975), \textit{Love and Theft} (2001), \textit{Modern Times} (2006), \textit{Tempest} (2012), and the bootleg and outtakes from the 1990s to the astonishing \textit{Telltale Signs} (2008) and the highly revealing \textit{The Cutting Edge} (2015). The seminar will also consider Dylan’s role in film, particularly the brilliant commercial failure, \textit{Masked and Anonymous}, from 2003, a work of high allegorical import. We will also look at Todd Haynes’ insightful 2007 movie \textit{I’m Not There}, which captures the essence of some of Dylan’s persona creation, even though it initially met with bafflement from many critics. We will also read Dylan’s \textit{Chronicles vol. 1}, itself a work of genius, a sprawling Dylan prose song posing as an autobiography.

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\textbf{My relationship with a faculty member which began in a freshman seminar, continued in an independent study, and concluded in her supervising my thesis.}

— \textit{A FRESHMAN SEMINAR STUDENT}
BUILDING A LIVING CELL ONE BRICK AT A TIME
Alain Viel (Department of Molecular and Cellular Biology)

Freshman Seminar 250  4 credits (fall term)  Enrollment: Limited to 14

Synthetic biology is an emerging multidisciplinary field of research aimed at developing solutions to problems impacting our individual lives and, ultimately, our long-term survival as a species. Some challenges can be addressed by the development of microorganisms reengineered to perform new functions. New fast and effective methods to sequence the genome of reengineered bacteria have been developed. In this hands-on laboratory course, students will modify the genome of E. coli and study the inner workings of nanopore sequencing, a method allowing for the fast sequencing of entire bacterial genomes. The course gives students the experience of how science is done and how technologies are developed through the practice of experimental inquiry. To understand how a synthetic biological system is built, students will learn how to design experiments and then test their designs. To understand how nanopore technology was developed and how the commercially available nanopore-sequencing instrument works, students will perform experiments illustrating the guiding scientific principles behind this technology. The weekly meetings will include short discussions of selected topics and a discussion of the planned experiments. During the three-hour laboratory sessions, teams of students will have access to a fully equipped laboratory dedicated to undergraduate research and will perform experiments that they design during previous class meetings. This course will show how a multidisciplinary approach contributes to today’s scientific discoveries. Students will have flexible access to the teaching laboratory to continue their experiments outside of the hours scheduled for the seminar.

THE CALL OF BEAUTY
Elaine Scarry (Department of English)

Freshman Seminar 39N  4 credits (spring term)  Enrollment: Limited to 12

Across the centuries, philosophers, poets, scientists and mathematicians have meditated on the nature and power of beauty. Some have said beauty calls on us to educate ourselves; others have said it is a call to repair the injuries of the world. Our readings will come from both men and women: Plato and Sappho in ancient Greece; Aquinas and Lady Murasaki in the medieval period; Rilke and Maya Lin today. We will study features associated with beauty, such as color (e.g., “The Lady and the Unicorn” tapestries depicting the five senses) and symmetry (e.g., Augustine’s De Musica; a book on symmetry by astrophysicist Mario Livio; a recorded debate among physicists about math and beauty). Does the call of beauty change according to its location? Among the sites we will contemplate are the beauty of earth (e.g., the writings of environmentalist Rachel Carson; the ephemeral sculptures of Andy Goldsworthy) and the beauty of faces (such as Homer on Helen, Seamus Heaney on an unnamed soldier).
CHILD HEALTH IN AMERICA
Judith S. Palfrey (Harvard Medical School and Harvard T.H. Chan School of Public Health) & Sean Palfrey

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

How can American healthcare 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 healthcare in the United States, exploring the impact of geography, environment, nutrition and clean water, as well as of the scientific discoveries of the late 19th century and the early 20th century and the emergence of the high-technology care of the middle and late 20th century. Then they will pose the question, “Does America provide children and youth the best possible healthcare available in the 21st 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
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 argued that slavery was sanctioned by the Bible. This course 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: 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? Students will read major historical interpretations of slavery, but they will particularly focus on primary documents, including proslavery tracts and sermons, abolitionist speeches, poems and the personal religious narratives of enslaved men and women. We will also read parts of Harriet Beecher Stowe’s Uncle Tom’s Cabin, one of the most controversial novels ever published in the United States. In addition to discussing the readings during class meetings, we will listen to spirituals and analyze paintings, photos and other objects (for example, abolitionist tokens). In addition to our regular class meetings, we will take a guided walking tour of Boston’s Black Heritage Trail. The tour will include an exploration of the African Meeting House.
THE CITY OF TOMORROW: CONSTRUCTING AND INHABITING THE 21ST CENTURY
Arthur I. Segel (Harvard Business School)

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

Note: As part of this dual process of investigation and application, students will have the opportunity to meet with 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. For example, the quality and availability of affordable housing 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 a personal home to a megacity, this seminar focuses on how the built environment is a fingerprint of our societal values and how it can be a vehicle for 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 utopia.

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, and so on) 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 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?
COMICS AND GRAPHIC NOVELS
Stephen Burt (Department of English)

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

Comics and graphic novels, or sequential art, are one of the world’s great storytelling media. We’re going to learn how to read them, how to talk about how they get made and how they work, how to understand—and how to enjoy—some of the kinds of comics and graphic novels (that is, some of the genres) that make up the history of this medium in the modern English-speaking world. History has three strands, which cross and re-cross, but which need to be understood independently, and we will see all three: short-form strip comics, designed for newspapers beginning in the 1890s and now flourishing on the Web; action-adventure and superhero comics, invented in the late 1930s, transformed in the 1960s and again in the 1980s, usually created by teams, and important to popular culture today; and a third strand beginning with “underground” or “alternative” comics or comix (with an x) in the 1960s and evolving into long-form graphic novels, often created by single writer-artists, today. That history comes with visual references, which you will learn to recognize; comics also come with their own set of theoretical terms, which you’ll learn to use. Comics today share a medium (pictures and usually words in sequence) but belong to several genres; we’ll learn how to talk about them and how they’ve evolved. You’ll get the chance to make comics and to figure out how creators collaborate, advocate, distribute and sometimes even earn a living from the comics they make, but the course will focus on existing comics, from McCay to Bechdel, from Kirby to Ms. Marvel—as events in culture and as works of art.

COMPARATIVE HISTORICAL MYTHOLOGY
Michael 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-page book on the topic (Oxford University Press, December 2012). Comparative mythology has been a well-trodden but controversial field since at least 1800. The 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 widespread worldwide similarities in myths have been archetypes (C.G. Jung) and diffusion (L. Frobenius/H. Baumann). Both approaches are inadequate to explain these similarities. Approaching myths historically, and working backwards from our earliest written sources (Egypt, Mesopotamia, Levant, India, China, Maya, and so on), earlier stages in the development of mythologies can be detected through successive reconstructions. They 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 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 Fisher (Department of English)

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

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.

CONTAGION: EPIDEMICS AND ENDEMICS FROM BLACK DEATH TO EBOLA
Ahmed Ragab (Harvard Divinity School)

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

For centuries, communicable diseases ravaged different communities, causing massive mortality and morbidity. The death toll disrupted social organizations, destroyed families and challenged medical thought and State authority. Physicians struggled to make sense of contagion, disease factors and treatment; State authorities were faced with demands to intervene, protect and support the sick, all while its own institutions were ravaged by diseases; social, religious and legal institutions were disrupted, stressed and tested time and again. In this course, we trace how epidemic and endemic diseases influenced medical practice and public and global health, and how they impacted social structures in different periods and regions. We ask about the meaning of contagion, and how physicians understood disease transmission before and after germ theory. We investigate the history of quarantines and isolations, and ask about stigma attached to diseases, and about race, gender and sexuality in the making of stigma. We also look at how colonialism affected disease transmission and how colonial powers dealt with epidemic and endemic diseases. The course moves from Black Death in the 14th century to other plague epidemics in the 18th century, where debates on contagion in medicine became most heated. We study tropical diseases and discuss the cholera epidemics of the 19th century to the much feared tuberculosis. We then discuss vaccination and eradication as we analyze small pox, measles and polio, ending with our most recent epidemics: HIV and Ebola. The course introduces students to history of medicine and history of epidemics, as well as to discussions of epidemiology, medical practice and medicine in society.
COSMIC EXPLOSIONS
Edo Berger (Department of Astronomy)

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

Somewhere in the universe a massive star ends its life in a supernova explosion every second (you can count: “1 supernova, 2 supernova, 3 supernova…”). These supernovae, and other types of cosmic explosions like them, play a critical role in shaping the universe. They are responsible for the synthesis and dispersal of all the chemical elements heavier than hydrogen and helium, and, therefore, provide the building blocks for the next generations of stars, for planets and ultimately for life. These cosmic explosions also give birth to exotic objects, such as neutron stars and black holes. Finally, the explosions are so powerful that they can influence the formation of new stars within their galaxies. In this seminar, we will explore how different types of cosmic explosions occur and how they influence the universe and life within it. Equally important, we will actually use telescopes in Cambridge and in Arizona to study a new supernova explosion during the semester.

CREATING CULTURES OF SEXUAL RESPECT ON CAMPUS
Diane L. Rosenfeld (Department of Human and Evolutionary Biology)

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

Campus sexual assault has emerged into the national discourse in an unprecedented way. This seminar provides an opportunity for students to engage in productive discourse about the issues, debates and tensions within the movement to protect students from sexual assault. We will grapple with the various cultural, societal, legal, moral and political factors that contribute to this problem with a focus on identifying the levers most likely to produce social change. We begin with an examination of the current debate on college campuses concerning the rights and responsibilities of students toward each other, and the schools’ corresponding responsibility to create a safe and equal learning environment for all. Many of the issues are playing out here on our own campus at Harvard, and we will deconstruct the constellation of factors that contribute to the current campus climate. For example, how might popular culture, music, pornography and advertising inform questions of consent between students? How does the role of alcohol and drug use either complicate or simplify our analysis of these cases? What role might sports culture and male-only social spaces play in creating an unequal educational environment? Is it the same for all-female spaces? How might dominant culture impact racial, sexual and gender minorities? How can we harness the power of peer-to-peer influence to generate a refreshed discourse on sexual respect? Drawing from law, anthropology, sociology, philosophy and political science, we will explore innovative approaches informed by student experience in creating cultures of sexual respect.
THE CREATIVE WORK OF TRANSLATING
Stephanie Sandler (Department of Slavic Languages and Literatures)

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

Prerequisite: Requires knowledge of one language besides English.

Translation makes culture possible. Individual writers and thinkers draw sustenance and stimulation from works created outside their own cultures, and artists working in one format get ideas from those working in entirely different media. Translation between languages and between art forms will center our seminar’s work. Taking a broad view of translation as a mental activity, we will study poems, fiction, film, photography and music. We will stretch our own imaginative capacities by transposing material across media and genres, creating homophonic translations and translating between languages. We will work individually as well as collaboratively. We will read a small amount of translation theory and some reflections by working translators. We will invite into our classroom a practicing poet, artist and translator or two, attend poetry readings and lectures at Harvard, and have at least one field trip, to the Boston Museum of Fine Arts. The only requirement is some knowledge of a language besides English and a readiness to play with languages, art forms and texts. Readings from Kazim Ali, Gennady Aygi, Walter Benjamin, Caroline Bergvall, Jorge Luis Borges, Joseph Brodsky, Anne Carson, Emily Dickinson, Forrest Gander, Robert Grenier, Susan Howe, Edmond Jabès, Velimir Khlebnikov, Vladimir Nabokov, Sappho, W. G. Sebald, Rosmarie Waldrop, Wang Wei, and the Bible; music by John Adams, Luciano Berio, and David Grubbs; artwork by Peter Sacks, Frances Stark; films to include The Clock, Despair, and The Golem.

DEATH: ITS NATURE AND SIGNIFICANCE
Jeffrey Behrends (Department of Philosophy)

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

Here’s a hard truth: You are going to die. That’s nothing against you, of course. I’m going to die, too, and so is everyone else—it’s just the way of things for creatures like us. Yet, despite the central role that death plays in our existence, it seems to remain deeply mysterious in a number of ways. It is difficult even to say precisely what death is—is it a mere biological phenomenon? If so, is there any sense to be made of the idea that I might continue to exist after my death, perhaps as a soul? Or is death instead final, in the sense that it causes me to cease existing altogether? Beyond these kinds of questions about death’s nature, there are also questions about death’s significance or value: Is death bad for the person who dies? If they go out of existence, how could it be bad—things can’t be good or bad for us if we don’t exist, it seems! Is it better to die at a certain age or time than some other? What should I think about my future death—should I fear it? Would it be better for us if we were immortal? In this class, we’ll examine important philosophical work that responds to each of these questions, and more.
DREAMS: OUR MIND BY NIGHT
Deirdre 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 course 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 course 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 also in class exercises. You’ll keep a dream journal for the first half of the course, participate in experiential dreamwork exercises, and write a term paper to explore a topic of your choice in more depth.

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

Freshman Seminar 27K  4 credits (spring 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. In important ways, 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 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 course will be to choose energy changes that we would like to 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 happen, losers must at least be brought to accept the change. One goal of the course 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.
ENTREPRENEURSHIP AND VENTURE CAPITAL IN THE GLOBAL ECONOMY
Paul A. Gompers (Harvard Business School)

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

Entrepreneurial activity has been a potent source of innovation and job generation in the global economy. In the U.S., the majority of new jobs are generated by new entrepreneurial firms. Entrepreneurship has had many definitions over the past two and one half centuries since Richard Cantillon first used the term in the early 18th century. Some have focused on the risk-bearing nature of entrepreneurship, while others have focused on the innovations that entrepreneurs create. Both are important elements of what entrepreneurs do, but neither is a complete definition of entrepreneurship. This seminar will examine the role that entrepreneurship and venture capital plays in economic development and innovation. Academics and policy makers have long highlighted the critical role that these sectors play in promoting a dynamic economy and opportunities for sustained competitive advantage. In particular, venture capitalists have been the source of financing for most of the major technology leaders, including Microsoft, Apple, Google, Amgen and Facebook. Numerous countries have sought to grow their domestic venture capital industry. This seminar will explore the phenomenon through the lenses of economics, history and psychology. Entrepreneurial and venture capital markets in the U.S., Israel and China will be examined in depth through academic articles, books and Harvard Business School case studies. In addition to traditional class sessions, the seminar will incorporate field trips to the Harvard Innovation Lab and start-up companies.

THE EXCEPTIONAL PRIMATE: DEBATING KEY QUESTIONS IN HUMAN ORIGINS
Manuel Dominguez-Rodrigo (Department of Human Evolutionary Biology)

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

What does it mean to be human? Do we understand “humanity” from traits we share with other animals, or by examining what separates us from them? What constitutes a “human” body, brain or behavior, and how are these aspects of ourselves the products of long-term adaptation? The origins of humanity can be studied from several interrelated perspectives: biological, behavioral and adaptive. In this seminar, we will explore how these three perspectives can be integrated to better understand our origins and to address the big questions that drive research on our evolutionary history. Each course meeting will focus on one aspect of humans as unique primates—for example, our physical movements, eating patterns or social behaviors. Through readings, discussions and hands-on learning, including visits to the Peabody Museum collections, we will examine the roots of our uniqueness. We will rigorously examine and critique the scientific evidence for 6 million years of human origins, including fossil, genetic and archaeological data. At the same time, we consider evidence that some traits that are not, as commonly supposed, unique to humans, but rather are shared with other primates. Discussion of “exceptionally human” features will not be limited to the past, but will also take students into the present—for example, by critically examining the ways in which our modern skeleton, our digestive system and contemporary health conditions, our diverse physical appearances, our choices of intimate partners, and our tendencies toward violence or peacemaking have been shaped by long-term evolutionary processes.
EXPLORING THE INFINITE
Peter Koellner (Department of Philosophy)
W. Hugh Woodin (Department of Mathematics and of Philosophy)

Freshman Seminar 23C  4 credits (fall 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 begin our exploration of the infinite with questions like these. We will examine the different senses of the infinite by seeing how the infinite arises in many disciplines, from theology to the arts, from physics to modern mathematics. We will eventually focus on the infinite in mathematics, and we will pursue its systematic study. But even here we are beset by difficulties. For there are 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 from 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 19th 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

Moving chronologically from the early national period to the turn of the 21st century, this course uses key literary works to examine the religious history of the United States. Wrestling with questions of deism, Calvinism, revivalism, race, gender, secularization and much more, 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 Susanna Rowson, Harriet Beecher Stowe, James Baldwin, Rudolfo Anaya, Pearl Abraham and Marilynne Robinson. I will offer mini-lectures to contextualize these works in their historical moment. We will read a pair of scholarly works to give us some theoretical tools of analysis. But mostly we will read and talk about the novels themselves.
FEUDING AND PEACEMAKING IN VIKING-AGE ICELAND (C. 870 TO C. 1150 C.E.)
Stephen D. White (Department of History)

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

Settled primarily by people from the Scandinavian mainland, Viking-Age Iceland (c. 870 to c. 1150 C.E.) was a stateless society with a highly sophisticated legal culture, but without public officials to adjudicate disputes, enforce the law or punish legal violations. The main sanctions against wrongdoing were monetary compensation, vengeance, feuding, and outlawry. To understand how this complex but unstable legal order was maintained and how competition for honor and power was kept within bounds, the seminar uses close readings, written analyses and class discussions of Icelandic family sagas, poems, historical narratives, and legal texts to study feuding and peacemaking, honor and shame, anger and hatred, kinship and marriage, gender, chieftaincy and clientage, gift-giving and plundering. It gives particular attention to the politics and group psychology of violent revenge and the roles of both men and women in containing it. By studying these topics in a medieval Icelandic context, the course also introduces students to subjects of ongoing research and controversy among historians of early Europe and to the social theories and paradigms that underlie their work. The course presupposes no previous knowledge of medieval history or literature.

FILM MUSIC AND FILM SOUND
Carolyn Abbate (Department of Music)

Freshman Seminar 38V  4 credits (fall term)  Enrollment: Limited to 12

Note: You do not need to read music for this seminar: film music and sound are aural arts, based on listening while seeing, and we rarely refer to musical notation.

This seminar centers on classic film music written for movies from the 1920s to the 1960s and will discuss some of the very greatest soundtracks and musical scores from this era, dealing with both Hollywood and European cinema. We also explore film sound in general: the technologies that made silent movies “talk,” the rules and tricks of sound and music production for film, and the scientific and aesthetic theories behind different approaches to the soundtrack.
FINDING CONNECTIONS: PERSPECTIVES ON PSYCHOLOGICAL DEVELOPMENT AND MENTAL ILLNESS  
Nancy Rappaport (Harvard Medical School)  
Freshman Seminar 25N  4 credits (fall term)  Enrollment: Limited to 12

The seminar’s challenge will be to deepen our understanding of human development and how individuals cope with serious emotional or social difficulties (neglect, bipolar disorder, autism, depression, schizophrenia). We will use multiple perspectives: medical observations and texts that provide practical knowledge (e.g., The New England Journal of Medicine review articles), narrative readings to understand how patients experience the meaning of illness from the inside out (e.g., The Center Cannot Hold), visitors who will discuss their experience with mental illness, and how development-related mental illness is portrayed in the press (e.g., The New Yorker articles). We will start with the mental life of babies and how scientists interpret infants’ nonverbal ways of finding safety and security. This begins the journey of our understanding fundamental needs for tenderness, holding and making meaning. Understanding how conditions, such as autism, depression and schizophrenia are described in clinical research and literature will help us to appreciate the biological vulnerabilities and relational patterns that may disrupt the human connection. We will examine the resourcefulness required for both fragility and resiliency. Throughout the seminar, the instructor, as a practicing child and adolescent psychiatrist, will bridge the gap between research findings, clinical applications and everyday insight.

FINDING YOUR INNER NEANDERTHAL  
Christian A. Tryon (Department of Anthropology)  
Freshman Seminar 70N  4 credits (fall term)  Enrollment: Limited to 12

Much of our history is written in our genes, and analyses of ancient and modern DNA have revealed that many living humans retain a genetic signature from our extinct evolutionary cousins, the Neanderthals. In this course, we will work together to help you find your inner Neanderthal. Our understanding of the past begins as you learn to make your own stone tools, a unique window to interpret the Paleolithic record. This experience guides your examination and analysis of real artifacts made and used by Neanderthals more than 50,000 years ago, drawn from the extensive collections of Harvard’s Peabody Museum. The ability to create and interpret the archaeological record provides unparalleled insight to explore what the Neanderthals did and thought, and how they lived, loved and died in Ice Age Eurasia. In addition to artifact manufacture, analysis and weekly readings, there will be a field trip to the American Museum of Natural History in New York City to examine how Neanderthals and other early humans are represented in public displays of the past, and the course will culminate in the student design of a museum exhibit to be displayed on the Harvard campus. This seminar will draw on perspectives from archaeology, paleontology, the history of science and museum studies to examine the Paleolithic; it will provide the ability to think critically about how we interpret the past and will explore how a study of our extinct relatives reveals the biases inherent in our perceptions of the world around us.
FOLKLORE AND THE CULTURE OF CHILDHOOD
Maria Tatar (Department of Germanic Languages and Literatures and of Folklore and Mythology)

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

This course begins by examining an international repertoire of traditional stories and explores the migration of fairy tales into literary and cinematic cultures for adults and for children. From the wonder worlds of fairy tales, with their high coefficients of weirdness, we will travel down the rabbit hole with Lewis Carroll’s Alice and soar up to Neverland with J.M. Barrie’s Peter Pan. J.K. Rowling, Neil Gaiman, Philip Pullman, and others will guide us through our investigation of what Graham Greene called the “excitement and revelation” of books read in childhood.

FOOD FOR THOUGHT: CULINARY CULTURE IN SPAIN AND BEYOND
Johanna Damgaard Liander (Department of Romance Languages and Literatures)

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

Note: The class will engage in hands-on sessions in the kitchen.

The French have said that the history of a nation depends on what they eat. Yet in the case of Spain, it’s clearly the reverse. What Spain has eaten has been a consequence of the country’s vast—and often turbulent—history. Invasions, expansions, exile and immigration have created and continue to create the cuisine and culture, which will be our focus in this seminar. Likewise, we will consider Spain’s culinary exchange with Latin America, with specific reference to Argentina, Peru and the Caribbean. From don Quixote’s rudimentary repas to Almodóvar’s gazpacho, we’ll conclude at the tables of the globalized metropolis. We will first consider food and identity, then food—its rituals and traditions. We will examine Spain from the Middle Ages until the present, the history and regions of the peninsula and the culinary consequences of transatlantic voyages. We will also consider the repercussions of Europeans arriving in the 19th century, and those of the many closer, traumatic events of the 20th century and beyond. The readings, all in English, are by novelists, historians, chefs, food critics, sociologists, poets, cartoonists and travel writers over the span of 10 centuries. The films and videos are more recent and will have subtitles. No previous knowledge of the Spanish language, or travel to any of the countries mentioned, is required. Neither do prospective students need extensive cooking skills. The only prerequisite is curiosity about what, why and how the people of Spain and Latin America have eaten throughout their history and how that reflects identity and culture of these lands.
FOOD, UP CLOSE AND PERSONAL
Noreen Tuross (Department of Human Evolutionary Biology)

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

Several times a day, you decide what to eat and drink. What happens to the food in your body? How is it turned into you and how has evolution shaped some of your choices? We alternate among popular nutrition literature, peer reviewed papers and discussion of data to unravel some of the complicated issues surrounding human nutrition. We will examine the published results from “The Biggest Loser” television program and explore the effects of alcohol on the body and brain. We will, of course, cook. The class will meet for three hours each week, and attendance is mandatory. As a group, the class will plan a cooking and eating experience, and each student will present on at least one of the topics in the class.

FREE SPEECH
Sanford 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 study 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 US 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 MIDEAST
Charles 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 course 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 course 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 course 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.

GEOSCIFI 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 discuss 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 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.
GETTING TO KNOW CHARLES DARWIN
William Friedman (Department of Organismic and Evolutionary Biology)

Freshman Seminar 24P 4 credits (spring term) Enrollment: Limited to 12

Note: Required field trips to the Arnold Arboretum of Harvard University, the Museum of Comparative Zoology and a local pigeon fancier will be included. Transportation will be provided.

Do you think you know who Charles Darwin was—the legendary and sober-looking bearded scholar behind the most important paradigm shift in human history? In this seminar, we will read a selection of Darwin's publications (including parts of Darwin's seminal work, *On the Origin of Species*), as well as his private correspondence, paying close attention to the man behind the science as revealed by his writings. We will get to know Charles Darwin—the avid breeder of pigeons, lover of barnacles, devoted father and husband, gifted correspondent and tactician, and remarkable backyard scientist. In this latter vein, we will reproduce 10 of Darwin’s classic Down House experiments that were central to making his case for natural selection and evolution, as well as his many other books on natural history. Field trips to the Arnold Arboretum of Harvard University, the Museum of Comparative Zoology, and a local pigeon fancier will provide the setting for recreating a selection of the myriad observations of organisms and their interactions with the environment and each other that made Darwin the master of minutia and provided the foundation for his grand synthesis of evolutionary pattern and process. Each week, we will also read, react to (through writing) and discuss Darwin's published writings and letters.

GLOBAL HEALTH: COMPARATIVE ANALYSIS OF HEALTHCARE 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 comprise 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 an in-depth topic of their choice and prepare a manuscript potentially for publication in a peer-reviewed journal.

GO ROCOCO! THE ARCHITECTURE OF MISCHIEF, EXCESS AND THE MESS
Andrew J. Holder (Harvard Graduate School of Design)

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

Note: Design skill, expensive software and specialized computer hardware are not required. Absolute neophytes welcome.

“Go Rococo” is a hybrid course that will combine the reading and writing typical of an architectural theory seminar with a design project. Analytical observations will be put into practice, and students will learn by making. At the beginning of the 18th 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 and messy (or at least no longer classically ordered) during this period, filled almost to the point of overflowing with painting and sculpture, much of it depicting characters in mischievous and compromising postures. Coursework 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. Each week, students will examine a Rococo building precedent, reading the architecture of the period against a series of texts on contemporary design theory. In addition, students will undertake a semester-long design project using Adobe Creative Cloud digital design tools to create and animate an architectural interior in the manner of the Rococo. Regular class sessions will be supplemented by software tutorials and trips to the Houghton Library and Fogg Museum to encounter Rococo artifacts in-person.

**THE GRAIL QUEST OF MARCEL PROUST**

Virginie Greene (Department of Romance Languages and Literatures)

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

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 13th-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*, and so on). *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. No previous knowledge of the Middle Ages, Proust or French is necessary. 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, and so on) in the Boston area. All locations will be wheelchair accessible and reachable by public transportation.
GREAT BOOKS OF JUDAISM
David Stern (Department of Near Eastern Languages and Civilizations and of Comparative Literature)

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

Note: No previous background in Jewish studies or knowledge of Hebrew is required.
What makes a foundational religious book? How do the texts of these books develop, and what functions do they serve as material objects—physical books—in religious communities and traditions beyond conveying the texts they contain? This seminar will explore these questions by examining four “canonical” books of Judaism—the Babylonian Talmud; the Bible commentary of Rashi, the most famous Jewish commentator; the Prayerbook; and the Passover Haggadah—as they have developed from the ancient period until today. In the case of each book, the text will be studied historically—“excavated” for its sources and roots, and its subsequent development over the centuries—and holistically, as a canonical document in Jewish tradition. Class time will be devoted primarily to learning to read the primary sources in translation; supplementary secondary readings will provide historical and cultural context. The seminar will also include regular visits to Houghton Library to look at manuscripts, early printed editions and facsimiles of these books in order to consider the relationship of materiality to textuality, and to study the changing shapes these books have taken as a key to understanding how they were studied and used. While each book will raise its own set of issues, we will repeatedly deal with three basic questions: What makes a “Jewish” text? How do these texts represent different aspects of Jewish identity? What can these books tell us about the canonical books of other religious traditions?

GUT REACTIONS: DISCOVERING CHEMISTRY FROM THE HUMAN MICROBIOTA
Emily P. Balskus (Department of Chemistry and Chemical Biology)

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

The human gut is colonized by trillions of microorganisms that exert a profound influence on our health. Notably, the chemical capabilities of gut microbes extend beyond those found in our own cells, playing roles in nutrition, directing immune system development, and protecting against pathogens. However, we still do not understand how the vast majority of this microbial chemistry actually takes place, which stands in stark contrast to our knowledge of human physiology. The aim of this laboratory-based seminar is to expose students to a cutting-edge area of research at the interface of chemistry and microbiology. Over the course of a semester, students will work as a team to design and implement an experimental approach for discovering new enzymes from human gut microbes. Potential targets include enzymes involved in antibiotic resistance, metabolism of dietary components and pharmaceuticals, and modification of host metabolites. Students will pursue these goals in a fully equipped laboratory dedicated to undergraduate research. Course meetings will combine time in the lab with discussion of research literature and experimental techniques. Students will also have flexible access to the teaching laboratory.
to continue their experiments outside of the hours scheduled for the seminar. By having the opportunity to both explore a timely scientific problem and to drive the direction of their own research at a very early stage in their academic experience, students in this seminar will be extremely well prepared to seek out further undergraduate research opportunities and to pursue scientific career paths.

**HARVARD POETS**  
**Elisa New (Department of English)**

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<th>Freshman Seminar 60T</th>
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The first part of the course will include close readings, video tours and on-foot excursions around 17th-, 18th-, and 19th-century Harvard Square as we read Ann Bradstreet, Edward Taylor, Michael Wigglesworth, Phillis Wheatley, Henry Wadsworth Longfellow, James Russell Lowell, Maria White Lowell and Ralph Waldo Emerson. In this part of the course, we will practice a range of approaches to reading poems, considering a poem’s form alongside its cultural function, surveying the diverse and changing media and formats in which poems circulate (manuscript, performance, print, aural recording, performance); individual volume, general circulation (magazine or newspaper, literary quarterly, schoolbook, gift book, psalter) and more. Excursions may include visits to First Parish or Memorial Church, to Mount Auburn Cemetery, Washington’s Headquarters and the Longfellow House. In the second part of the course, we will focus on 20th-century Harvard and its writers, with particular attention to four Harvard-inflected moments in American literary history: the emergence of Modernism (with attention to Robinson, Du Bois, Frost, Reed, Stevens, Cullen); the rise of the New Criticism in the 1950s (its standard bearers, Eliot and Lowell); the critique of New Criticism and rise of counter movements, New York School, Black Mountain, Beat Language, L=A=N=G=U=A=G=E (from O’Hara, Ashbery, Koch, Creeley to Hejinian, Bernstein, Howe); and, finally, Harvard and Radcliffe’s role in fostering poets from Gertrude Stein, Elizabeth Bishop through June Jordan and Adrienne Rich. Our 20th-century studies will take us to the Woodberry Poetry Room and to Houghton and Schlesinger libraries, and students in the seminar will make their own contribution to Harvard’s long poetic tradition by filming individual and group readings and interpretations of American poems for inclusion in the *Poetry in America* MOOC and other online outlets.

**HEALTH AND MENTAL HEALTH IN EVERYDAY LIFE**  
**Mary Ruggie (Committee on Degrees in Studies of Women, Gender, and Sexuality)**

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<th>Freshman Seminar 48E</th>
<th>4 credits (fall term)</th>
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Why do students feel ill before an exam? Why do women seem to suffer more than men from depression and eating disorders, whereas men use and abuse substances more than women? Why do some racial or ethnic groups have better or worse health and mental health outcomes than others? These are some of the questions this course addresses. Using interdisciplinary perspectives, we will investigate how such social and personal characteristics as gender, race/ethnicity, family background and self-esteem impact health and mental health behaviors and outcomes. We will
also examine how specific configurations of circumstances and contexts contribute to health and mental health problems. For instance, college students, regardless of gender, race/ethnicity, and so on, are increasingly experiencing stress and turning to amphetamines at higher rates than young adults who are not in college. One goal in these classes will be to explore causes and consequences. Another will be to understand the role of individuals themselves, their personal and social support networks, and healthcare professionals in developing and guiding positive strategies for coping and healing. Throughout, we traverse the boundary between health and illness in order to understand the complex web of factors that create and jeopardize well-being. Students will present analyses of the readings in class and write short papers based on class readings and discussions, as well as additional research. Students will also give two brief presentations: a team project and a representation of health or mental health in the arts.

THE HOLOCAUST IN HISTORY, LITERATURE AND FILM
Kevin J. Madigan (Harvard Divinity School)

Freshman Seminar 49G  4 credits (fall term)  Enrollment: Limited to 15

This seminar will approach the Nazi persecution of European Jewry from several disciplinary perspectives. Initially the seminar will explore the topic historically. In these weeks, the seminar will use a variety of historical materials dealing with the history of European anti-semitism, German history from Bismarck to the accession of Hitler, the evolution of anti-Jewish persecution in the Third Reich, and the history of the Holocaust itself. Sources to be used will include primary sources produced by the German government from 1933 to 1945, by Jewish victims-to-be or survivors, documentary films, and secondary interpretations. The aims of this part of the seminar will be to understand the basic background to and narrative of the Holocaust, to introduce freshmen to the use of primary historical sources and to familiarize them with some of the major historiographical debates. Then the members of the seminar will ponder religious and theological reactions to the Holocaust. Here the seminar will use literary and cinematic resources as well as discursive theological ones. The seminar will also consider the historical question of the role played by the Protestant and Catholic churches and theologies in the Holocaust. The seminar will conclude with an assessment of the role played by the Holocaust in today’s world, specifically in the United States. Throughout the seminar, participants will use various literary and cinematographic sources and test their limits in helping to understand and to represent the Holocaust.

HORROR IN LITERATURE AND MOVIES: CULTURAL, PSYCHOLOGICAL AND SCIENTIFIC ASPECTS OF THE HORROR GENRE
Steven 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 course will attempt to make sense of horror stories. We will work toward 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 course will also make use of classic and more recent horror movies and writing. In addition, there will be a strong creative component to this course. 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 course develop our own sense of what constitutes horror through careful academic scrutiny of the topic and through the honing of our own creative talents.

“HOW DID I GET HERE?” APPRECIATING “NORMAL” CHILD DEVELOPMENT
Laura M. Prager (Harvard Medical School)

Freshman Seminar 24U  4 credits (spring term)  Enrollment: Limited to 12

Understanding “normal” growth and development may seem like a relatively easy task at first. We take the nuances of developmental differences for granted because we’re so accustomed to experiencing them. Nevertheless, defining normal (vs. abnormal) development is a complex and controversial task. Development involves a tricky intermingling of environmental stimuli, cultural and social expectations, rapid and not-always-intuitive changes in brain development, temperamental differences, genetic inheritance, and mind-boggling brain plasticity. The course will start with a consideration of general themes and then move to a chronologic perspective. First, we approach child development as a dynamic force, one that simultaneously engages multiple domains: social/relational, cognitive, physical, moral. We will then switch to examine stages of development in sequence, using our understanding of neurobiological, physical, cultural and psychological factors to inform our assessment of how children change over time. Readings will include classic papers on development, textbook chapters that provide overviews of specific developmental stages, recently published research articles on genetic inheritance, selected contemporary children’s and young adult literature, personal memoirs, and short stories written about childhood.

HOW DID THE FIRST STARS AND GALAXIES FORM?
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 or galaxies like our own Milky Way did not exist, because the universe was denser than they are. We, therefore, face the important question about our origins: How and when did the first stars and galaxies form? Primitive versions of this question were considered by humans in religious and philosophical texts for thousands of years, long before it was realized that the universe expands. The Seminar will summarize the fundamental principles and scientific ideas that are being used to address this question in modern cosmology. Previous generations of scholars have also wondered about the long-term future of the universe. For the first time in history, we now have a standard cosmological model that agrees with a large body of data about the past history of the universe. The seminar will conclude with the forecast that this scientific model makes about our future. It will be based on a book with the same title written by Professor Loeb (Princeton University Press, 2010).
HOW STUFF WORKS
Richard D. McCullough (Harvard John A. Paulson School of Engineering and Applied Sciences)

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

Note: There are no prerequisites for this course, it does not require any scientific background and is open to all.

The rise of electronics-based technology has completely revolutionized the world over the last 30 years, giving rise to new ways to be entertained, to communicate and to work. Advancements in electronics have been primarily based on the chemistry and physics of new and improved electronic, magnetic and optical properties of the underlying materials. This course for non-scientists will focus on discussing and understanding how stuff works with a particular focus on electronic and optical devices. In addition, we will learn about how magnetic stuff works, where color comes from, about modern fabrics and other topics that students would find interesting. The course will also have the students read, research and discuss what future innovations and technologies might be possible. Students will be encouraged to be active participants in prognostication. Students will have to write a paper on a future technology or innovation that they predict will be commonplace in the future or on the topic of how [fill in the blank] works.

HUMAN BRAIN IN HEALTH AND DISEASE:
A NEUROLOGIST’S PERSPECTIVE
Thomas Byrne (Harvard Medical School)

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

Note: The course 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 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), or refusal of safe haven to refugees (to promote domestic human security). Despite more than 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 worldwide, 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 (fall term)  Enrollment: Limited to 12

Human rights practitioners confront numerous ethical, strategic and legal dilemmas in their struggles for social justice. This 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/outsider, 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.

IN SEARCH OF ROMAN MYTH
Jared M. Hudson (Department of the Classics)

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

Note: All readings are in translation. The course will include visits to both the Harvard Art Museums and the Museum of Fine Arts in Boston.

Classical Mythology has traditionally been identified with Greek mythology: mythos, that fundamentally Greek concept, is after all a Greek word. Although countless other non-Greek traditions of “myth” have been documented and studied by scholars (Maya Myth, Celtic Myth, Maori Myth, and so on), the primary role played by the Romans in the area of mythology has been seen as borrowers—and as preservers—of Greek myth. Early modern scholars of Roman culture offered various explanations for this awkward gap: perhaps, being a more practical, less imaginative culture than their Greek neighbors, the Romans really never had a mythology of their own; or else, when faced with the older and more sophisticated mythological system of the Greeks, they simply adopted it and promptly forgot their own. This seminar will take as its working assumption the simple idea that there was such a thing as Roman myth, distinct from that of the Greeks: traditional—ultimately authorless—“Roman” stories that Romans told themselves about their culture and their city. To take just a few of the more familiar examples, stories, such as those of Romulus and Remus, Lucretia, Cincinnatus and Virginia, were used by the Romans, from a very early period, as vital narrative tools for thinking with and for articulating their most pressing cultural values and concerns. Participants in the seminar will use textual (as well as material) detective work to piece together and interpret the scattered and often puzzling remains of these traditional tales in Roman (and Greek) literature.

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 vs. 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 from 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 also so called alternative medical writers, such as Andrew Weil. 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.

**INTRODUCTION TO TECHNOLOGY AND SOCIETY**

Venkatesh Narayanamurti (Harvard John A. Paulson School of Engineering and Applied Sciences)

**Freshman Seminar 22R**  
4 credits (fall term)  
Enrollment: Limited to 12

*Note: There are no prerequisites, but an interview may be required to have a balanced distribution of students spanning interests in the natural sciences, arts and humanities, and social sciences.*

From the digital revolution to social media, from global warming to sustainability, and from national security to renewable energy, technology plays a critical role in shaping our lives. This course explores concepts in physical sciences that span disciplines and examines broadly how technology shapes society and vice versa. Through case studies, students will be exposed to the importance of a conceptual understanding of science (including social science) underpinning technology and the tradeoffs necessary in tackling the great challenges facing a global society. The course has a foundation of both physical and social science concepts, sparking interest and encouraging future investigation into how technology and society are interwoven and mutually dependent. Each class will start with a discussion of blog posts of current news related to technology followed by selected areas of deeper engagement and discussion. Students will be involved through individual reflection and small team assignments to address specific problems, for example, the case of “wiki leaks” and its implications for issues of privacy and diplomacy and open government. The course is designed for physical science students to appreciate not only “how things work” but “how the world works” and for social science and arts and humanities students on not thinking of technology as a “black box.”

**IRELAND RISING**

Catherine McKenna (Department of Celtic Languages and Literatures)

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

*Note: Attendance will be required at a performance of The Abbey Theatre of Ireland’s production of The Plough and The Stars at the American Repertory Theater on Wednesday, September 28, 2016. There will be no charge to the student.*

The year 2016 marks the centenary of the violent, short-lived rebellion of Irish nationalists against English rule that is known as the Easter Rising. Unpopular and ineffectual in itself, the Rising marked a turning point in Irish politics that ultimately led to the establishment of the Irish Free State in 1922 and the Republic of Ireland later on. As Nobel laureate William Butler Yeats wrote of “Easter 1916,” “A terrible beauty is born.” This seminar will concentrate on the development
of a sense of “Irishness” in the 50 years or so leading up to the Easter Rising—in music, literature and the visual arts, in athletics, in language, in fascination with traditional Irish folklore—as well as on the politics of nationalism and the causes and consequences of violent rebellion. We’ll find our way back into the 1916 moment and beyond, to the cultural revival that enabled it, by examining writers and storytellers of the period—including Yeats, Lady Gregory, Douglas Hyde and James Joyce—images and objects in the Harvard Art Museums, documentary films, hurling matches, music, and more. We’ll discuss the pros and cons of violent revolution as the means by which a colonized people “summons her children to her flag and strikes for her freedom,” to quote the Proclamation of the Irish Republic of April 24, 1916. And we will explore the range of cultural practices that defines a people and a nation.

LANDMARK CASES IN AMERICAN CONSTITUTIONAL HISTORY
Michael Klarman (Harvard Law School)

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

This 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.
FRESHMAN SEMINAR PROGRAM

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 relation 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 intervene 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.

LAWRENCE OF ARABIA: HIS LIFE, LITERATURE AND LEGACY
Charles M. Stang (Harvard Divinity School)

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

During the First World War, a young British officer by the name of T.E. Lawrence helped lead an Arab Revolt against the Ottoman Empire, a war and a revolt that determined the shape of the modern Middle East, for good or for ill. After the war, Lawrence became famous in the West—the war’s first celebrity, “Lawrence of Arabia.” However, the long memoir he wrote shortly thereafter, Seven Pillars of Wisdom, was hardly celebratory. On the contrary, it is a tortured confession of the triumph and tragedy of the revolt: what “waking dreams” were had, and how they were dashed. Into that narrative Lawrence weaves captivating meditations—philosophical, psychological and religious. This course will look closely at Lawrence’s life, literature and legacy, through his own writings, and writings (and films) about him. We will endeavor to get past the myth, and to the man; past his part (however over- or underrated) in geopolitics, and to his peculiar and ambivalent genius. To that end, we will also attend to his life after the war, when he sought anonymity in the ranks of the Royal Air Force, devoted himself to new writing projects (including a translation of Homer’s Odyssey), and his fatal love affair with speed—which led to his untimely death in a motorcycle accident in 1935.

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.
— A FRESHMAN SEMINAR STUDENT
THE LAWS OF WAR AND THE WAR ON TERRORISM
Gregg Peeples (Department of Government)

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

The United States is currently engaged in a “Global War on Terrorism.” How that war is prosecuted has been the subject of heated national and international debate. How do (or should) the “laws of war” regulate the conduct of the United States—its officers, soldiers and agents? This seminar will explore the historical context for this debate. We will examine the development of the two central topics addressed by the Laws of War: *jus ad bellum*, which outlines a set of legitimate justifications and circumstances for the use of armed force; and *jus in bello*, known as the Law of Armed Conflict, which relates to the conduct and duties of belligerent states (and their soldiers) during times of war. We will investigate how governments, militaries, nongovernmental organizations, lawyers and scholars have interpreted these laws, paying particular attention to examples of military interventions and intra-state conflicts (such as civil wars and insurgencies). The seminar will also look into relevant U.S. law and institutions. Finally, drawing on this historical and legal background, seminar participants will engage in a series of informed discussions on how these laws, both international and domestic, have influenced the manner in which the U.S. has conducted military, intelligence, and anti-terrorism operations since 9/11.

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

Freshman Seminar 31Q  4 credits (fall 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 and one to the Somerville Research Facility of the Harvard Art Museums, which will entail two Wednesdays on which you will have to be available from 2pm to 6pm.

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 and Richter.
MEASUREMENTS OF THE MIND: THE CREATION AND CRITIQUE OF THE PSYCHOLOGICAL TEST
Marla Eby (Harvard Medical School)

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.

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

This course 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.

MEDICINE, LAW AND ETHICS: AN INTRODUCTION
Shahram Khoshbin (Harvard Medical School) with Laura Khoshbin

Prerequisites: All students are welcome, but this seminar is particularly geared to pre-medical and pre-law students. Students are advised that this course is intended to be introductory.

The seminar explores medical, legal and ethical aspects of medical care, with particular attention to medical decision-making at the beginning and end of life, participants in research on human subjects, human reproductive technologies, mental illness and experimentation on animals. Historical background of present-day medical practices and relevant law to be discussed.
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 highly visible events, such as the deaths of American presidents from cardiovascular disease, leading to the rise of biomedical research in the U.S., as well as relatively obscure 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 AND OTHER VIRTUAL REALITIES
Shigehisa Kuriyama (Department of East Asian Languages and Civilizations)

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

Note: No prior knowledge of economics, or experience with media or magic performance is required; the only prerequisites are curiosity and a spirit of adventure.

What is money? Its practical importance is plain, but its essence is a mystery. In different places, at different times, it has assumed such wildly varying forms as seashells, paper notes and computer data—a fact that reminds us that money isn't any fixed, concrete thing, a tangible object in the world, but rather a sort of virtual reality, something whose presence and power depends entirely on human perception. What makes money seem so potent and real? The seminar will bring together exploration of this question with the study of illusionism in two other domains—cinema and close-up magic. We will not only read about and discuss the theory of how virtual realities like money work, but also pursue practical hands-on exercises in movie-making and the design of mystifying tricks.
MONEY MATTERS
Eurydice 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 21st-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 7th-century B.C. to the end of the Gold Standard in the 20th 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 the 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, indeed, makes the world go ‘round.

THE MORAL COMPASS
Anat Schechtman (Department of Philosophy)

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

What determines the moral values and principles that orient and guide the lives of individuals and societies—the “moral compass” we use to navigate through the thicket of decision and indecision? What is this compass, and where does it come from? Is it God-given? Or, rather, is it the product of culture and society? Is it, perhaps, a matter of our genes, an evolutionarily determined instinct? Or is it the province of Reason, discoverable through the rational intellect (possibly by analogy to logic or mathematics)? Further, we might ask, is there just one compass, or maybe several legitimate ones, which can sometimes point in different and even incompatible directions? This course will explore a range of candidates for the moral compass or compasses. The aim is to better understand these candidates by reflecting on a number of attempts to develop and defend—or, in some cases, criticize and reject—a particular moral compass. We will read and discuss authors ranging from antiquity to the present day—including Aristotle, David Hume, Immanuel Kant, Friedrich Nietzsche, and Hannah Arendt—and examine how their ideas are reflected in works of art and reportage. A primary aim of the class will be to learn how to analyze, evaluate and construct a philosophical argument, both in writing and in oral conversation. Another aim is to gain acquaintance with key figures and texts in the history of Western philosophy. A third aim is to practice adopting a reflective stance toward one’s own moral compass and its philosophical underpinnings.
MORALITY, LEADERSHIP AND GRAY AREA DECISIONS  
Joseph L. Badaracco (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 that will be discussed in the seminar.

MULTIETHNIC AMERICAN SHORT STORIES: TALES WE TELL OURSELVES  
Tessa Lowinske-Desmond (Department of African and African American Studies)

Freshman Seminar 30U 4 credits (spring term)  Enrollment: Limited to 12

American short stories, as a genre, have always been used to capture “local color,” which in the earliest stories meant the scenery and culture of the Catskill Mountains in stories like “Rip Van Winkle.” It developed in niche regions throughout the United States and was read widely by a populace coming to terms with the rich diversity of peoples united in citizenship following the American Revolution. The short story genre has persisted in this important role and has been adopted by writers to make concise, insightful comments about American national identity and individuality. Taken up by African Americans, Jewish Americans, Asian Americans, Native Americans, Latinos and many others, the short story has been used to convey experiences with immigration and assimilation, discrimination and oppression, generational divides and interactions across difference. An examination of such short stories opens up readers to a deeper understanding of America’s multiethnic landscape. In this seminar, we will examine the historical context for the short story’s on going role in American culture. We will explore the dynamics of publishing houses and literary criticism that have alternately demeaned and bolstered the work of multiethnic writers; and we will examine the ways in which new technologies are changing how and what people read. But most important, we will explore stories written by a diverse group of American writers, including Toni Morrison, Jhumpa Lahiri, Junot Diaz and Sherman Alexie, to consider the ties that both link and divide our multiethnic world.
**MUSEUMS**

James Hanken (Department of Organismic and Evolutionary Biology)

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

What are museums? Where did they come from? What exactly do they do, and why? Do they have a future? This seminar will trace the history of museums from their beginnings centuries ago as personal collections maintained by private (wealthy) individuals to the modern institutions of today. We will consider not only the objects maintained in museums and their conservation, but also the role of museums in contemporary society, financial considerations associated with their successful operation, their dual—and sometimes conflicting—functions of scholarly research and public display, the mechanics and psychology of exhibit design, legal and ethical issues of collecting and acquisition, and challenges confronting museums and how they likely will fare in the future. The seminar’s focus will range from large art, archaeological and natural history museums to smaller and more specialized institutions that focus on particular cultural, scientific, artistic and engineering artifacts. Weekly class meetings will include both discussion sessions and field trips to museums at Harvard and elsewhere in the Boston area. During these trips, we will view public exhibits and gain access to “behind-the-scenes” collections and scholar/staff work areas that the public rarely sees. One weekend-day optional field trip to a museum outside Boston will be included as well, depending on student interest.

**MUSICAL JOKES FROM THE MIDDLE AGES TO THE PRESENT DAY**

Suzannah Clark (Department of Music)

Freshman Seminar 60J  
4 credits (spring term)  
Enrollment: Limited to 12

How good is music at telling jokes? What kinds of jokes and related forms of humor does music have at its disposal? How can we tell when music is joking? What do listeners need to know in order to get the jokes? In the first few weeks of the course, we will lay some foundations through the study of definitions of verbal jokes and prevailing philosophical, psychological and anthropological theories of why humans tell and appreciate jokes. We will test out these definitions and theories on viola jokes before turning our attention to music. Our musical examples will span the history of Western music, from roughly the late 12th century to the present day, in order to investigate which kinds of musical jokes are timeless and which ones are bound to their stylistic, historical, social, political and cultural contexts. Along the way, we will encounter music’s full range of humor, including some splendid pranks played on performers and audiences; clever send-ups; examples of stinging satire of the church and religion; musical barbs aimed at incompetent composers; critiques of social class, and not least, jokes about classical music itself.

One might imagine that a prerequisite for this class is a keen sense of humor. However, perhaps more relevant is a desire to discover what insights may be gained from studying music through the lens of its humorous utterances.
MY GENES AND CANCER
Giovanni Parmigiani (Harvard T.H. Chan School of Public Health)

Freshman Seminar 22H  4 credits (fall term)  Enrollment: Limited to 12

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 these types of decisions. The goals is to gain enough understanding of the scientific background to critically evaluate the discourse of a genetic counseling session. The course will proceed at first by laying essential foundations of genetic inheritance in humans; cancer evolutionary theories; statistical risk; and decision-making in healthcare. Subsequently, students will read articles from the scientific and popular press and listen to podcasts. In class, we will discuss the readings. There are no strict prerequisites, though some familiarity with the basic concepts of probability and genetics will be very helpful. 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 write two five-page double-spaced essays (midterm and final) and to lead a class discussion on the topic of one of their two 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 classes. Attendance is essential, not only for the students’ education, but for the benefit their contributions provide to the others.

NEUROFASHION
Kevin Kit Parker (Harvard John A. Paulson School of Engineering and Applied Sciences)

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

How does the way our brain is encoded to process visual signals influence the clothes we like? Some classic fashions, such as the Little Black Dress and the tuxedo, seem timeless. A close examination of these fashions suggest that in some form, they have transcended time and culture. If they are conserved in this manner, it suggests that there may be some biological reason why these fashions are so universally appealing. This seminar will examine fashion and visual signal processing in the human in an effort to understand if the structure-function relationships in the brain effectively “hard wire” us to prefer some clothing. We will cast a broad net from the design of fashions, their manufacture, the influences of culture and neuroscience in an attempt to understand the fundamental laws of fashion.
NEUROTOXICOLOGY: BIOLOGICAL EFFECTS OF ENVIRONMENTAL POISONS
S. Allen Counter (Harvard Medical School)

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

**Prerequisites:** This course welcomes science and non-science concentrators. Some background in high school biological and physical sciences is useful and preferred.

This seminar will explore a wide range of environmental and man-made neurotoxic substances and their effects on human and animal populations. Particular attention will be given to pediatric exposure to neurotoxic agents and associated neurodevelopmental disabilities, as well as neurobehavioral and immunological changes. The seminar will examine the impact on children of lead (Pb) exposure from Pb glazing activities, household paints and automobile petroleum emissions in the environment. Mercury poisoning through contaminated foods, cosmetics, vaccine preservatives, inorganic mercury in teething powders, elemental mercury from amalgamation, and magico-religious rituals will define another area of study. The basic neurophysiology and neurochemistry of a number of other neurotoxins, including arsenic, tetrodotoxin, saxitoxin, botulinum, curare, cocaine and “nerve gas” will be reviewed. What dangers do these toxins pose? What can or should be done to prevent exposure?

NIETZSCHE
Mathias Risse (Harvard Kennedy School)

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

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 very high literary quality of his writing. In this course, 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 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 autobiography, *Ecce Homo*, which Nietzsche wrote briefly before his mental collapses in 1889). The others 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.
NORTH KOREA AS HISTORY AND CRISIS
Carter Eckert (Department of East Asian Languages and Civilizations)

This seminar will explore the historical context of the present international crisis on the Korean peninsula and engage students in current debates about the crisis from a variety of different official, institutional and popular perspectives. The current crisis and its background will be investigated to include the views of North and South Korea, the United States, China, Japan, Russia and other concerned parties, such as the United Nations. Ultimately, students will be encouraged through readings and class discussions not only to develop their own perspectives on resolving the crisis but also to examine the role and importance of historical forces in shaping the crisis and its possible resolution. Students will be expected to prepare two short papers and a research paper; the papers should add up to about 25 pages of writing.

NUTRITION AND PUBLIC HEALTH CANCELLED
Clifford Lo (Harvard Medical School and Harvard T.H. Chan School of Public Health)

Note: Clinical rounds with the Nutrition Support Service at Children’s Hospital will be optional.

Introduction to the critical reading of technical nutrition and medical literature, this seminar surveys current issues in public health and public policy relating to nutrition. It provides critical analysis of different types of medical literature: historical monographs, metabolic laboratory observations, clinical case reports, epidemiological surveys, prospective randomized controlled trials, meta-analyses, and literature reviews. The aim is to prepare science and non-science concentrators to examine critically current controversies for themselves. The seminar requires active participation and presentation by students.

ON BROKEN GROUND: THE SCIENCE AND IMPACT OF EARTHQUAKES
Brendan Meade (Department of Earth and Planetary Sciences)

Earthquakes shape the surface of the Earth by building mountains and tearing continents apart. They can also lead to the massive loss of life caused by collapsed buildings and fast-moving tsunamis. The last decade has seen the loss of 800,000 lives and $350 billion in economic losses. While the effects of earthquakes have affected society from antiquity through the Enlightenment, a scientific understanding of earthquakes has only been developed in the

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.

— CARTER ECKERT, INSTRUCTOR
wake of the plate tectonics revolution of the 1960s. Here we study the causes of earthquakes, starting with observations of their behavior and developing the connections to the basic physics. The understanding of these processes has been complemented by the development of new imaging technologies that are forming the foundation for meaningfully informed seismic hazard assessments. Seminar participants will read from the popular scientific literature, cultural responses and human impact reports to develop a fact-based understanding of how earthquakes happen and how they have shaped societal responses. Case studies will include the 1755 Lisbon, the 1906 San Francisco, and the 2004 Sumatra earthquakes. These concepts and events will provide the basis for students to understand the increasing seismic hazard faced by a growing population across the world.

**ONE HUNDRED YEARS OF LABOR: LITERATURE, CINEMA AND POLITICAL THOUGHT SINCE THE RUSSIAN REVOLUTION**

Michael Kunichika (Department of Slavic Languages and Literatures)

Freshman Seminar 60U 4 credits (spring term) Enrollment: Limited to 12

The year 2017 will mark the centennial of the Russian Revolution. The century that lay between these two years of 1917 and 2017 can be approached in many ways, focusing on the rise and fall of the Soviet Union; the confrontation of liberalism, communism and fascism in World War II; the competition between the Soviet Union and America throughout the Cold War; and the spread (and crises) of global capitalism. The thread we will follow throughout this course is to think of the past century in terms of the story—or better, stories—of labor and the forms by which labor has been represented with a diverse array of media. We will examine how labor and work have been represented in primarily Russian and Soviet literature and film, while drawing comparisons from American and European cultural sources. We will consider both the Revolution as a historical phenomenon, examining central texts in which its ambitions and significance were contested, and then consider chapters in the on-going career of labor from the 1920s to the present day. We examine the seminal statements of Marx, Lenin and Trotsky; the groundbreaking films of Dziga Vertov and Sergei Eisenstein; and the enduring literary works of Andrei Platonov and Alexander Solzhenitsyn, among others. Alongside the Russian texts, we will read or screen works by John Steinbeck, Charlie Chaplin, Fritz Lang, and Eugene O’Neil. Throughout, we will be guided by several questions and concerns: how does a particular work represent labor and conceive its value? What is the nature of work? How is intellectual labor understood in relation to others forms of labor? How are bodies configured by different labor processes? And, lastly, what might this history tell us about the present state and challenge of labor and social inequity at the centennial of the Revolution?
ONE WORLD, 1943: OR, HOW AMERICANS DISCOVERED THE WORLD

Erez Manela (Department of History)

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

In late 1942, with World War II raging, US President Franklin D. Roosevelt sent his erstwhile opponent in the election of 1940, Wendell L. Willkie, on a trip around the world. Willkie's 1943 book about the trip, One World, sold millions of copies and topped bestseller lists for months. That book, since largely forgotten, will serve as the launching pad for our explorations. Following along with Willkie's itinerary, we will consider America's views and relations with the peoples of the “Global South”, including Africa, the Middle East, and Asia. We will also probe the wartime vision of “One World”, tracing its origins, contours, and legacies, grappling with its promise and problems, and assessing its profound implications for our own time.

THE PHYSICS AND APPLIED PHYSICS FRESHMAN RESEARCH LABORATORY

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

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

The aim of the seminar is to expose students who are considering careers in science or engineering to the environment of a modern research laboratory. Small, faculty-guided research teams will construct, perform, analyze and report on cutting-edge experiments in the physical, engineering and biological sciences. Students will participate in choosing the experiments based on class interests and available resources. They will be active collaborators in scientific projects that will require both team and individual effort. Projects will provide insight into the mathematical, mechanical, electronic, chemical, computational and organizational tools and skills that characterize modern experimental science. Past projects have addressed topics in atomic, nuclear and solid-state physics; materials science; dynamical systems; and biophysical science. And students have gained experiences with lasers, accelerators, particle and photon detectors, vacuum systems, electronic circuits and instruments, machine shops, computer interfacing, data logging and analysis, and scientific presentations.

PHYSICS AND BIG QUESTIONS

Gerald Gabrielse (Department of Physics)

Freshman Seminar 22V  4 credits (spring term)  Enrollment: Limited to 12

Three types of big questions will be considered. The first are the big questions about the limits and domain of physics. To start, what are the limits and domain of applicability of the classical physics studies studied in high school? How do these relate to special relativity, quantum mechanics and quantum field theory? Next, what are some of the big questions that physics seeks to answer. For example, what is the “standard model” of particle physics, and how is it...
tested? Other important big questions relate to how physics informs some major challenges to our society. For example, what does physics say about the options for powering our homes and cars, given limited petroleum reserves and the need to reduce carbon dioxide production? The final set of big questions is about the compatibility or incompatibility of physics and religious faith. Here we will consider very divergent answers in a climate of respect for what will be big differences in opinion.

**PHYSICS, MATH AND PUZZLES**
Cumrun Vafa (Department of Physics)

| Freshman Seminar 23P | 4 credits (fall 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 seminars 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.

**THE PLEASURES OF JAPANESE POETRY: READING, WRITING AND TRANSLATION**
Edwin Cranston (Department of East Asian Languages and Civilizations)

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

When you hear Japanese poetry mentioned, do you automatically think “haiku”? This seminar will show you what you have been missing! The world of the classical waka and its modern descendant, the tanka, will be at the seminar’s heart, but participants will also read examples of linked verse (renge) and modern poems in free and prose-poem forms. (And haiku, too!) The seminar will examine poems and poets from the 7th to the 21st centuries, encountering such themes as desire, renunciation, time, memory, war, death, sorrow and receptivity. Students will be encouraged to make connections with poems already known in other languages and traditions. All readings will be in English, but there will be ample opportunity for some Japanese to “rub off” in the process. Students will be asked to keep a diary of their encounters with the new poetry and will have the chance to practice the art of sequencing and to make their own translations based on literal renderings and explanations of Japanese originals.
POETRY AS A LANGUAGE LABORATORY
Aleksandra Kremer (Department of Slavic Languages and Literatures)

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

Typical means of everyday communication, such as speaking, writing or printing, can be taken to extremes in poetry. In our seminar we will explore such cases. We will measure voices of poets performing their texts, view electronic archives of poetry, examine untypical artists’ publications, attend a poetry reading, study barely legible texts, listen to sound poetry, and look at visual poems. We will confront these poetic experiments with scholarly texts from such disciplines as acoustic phonetics, sound studies, neuroscience, bibliography, literary studies, or graphic design. Ultimately, we will ask if artistic texts may contribute to our knowledge about writing, reading, hearing, speaking or publishing. In other words: Can poets anticipate, modify or inform academic research? We will study poems from different times and regions, with a special emphasis on the 20th-century European and American literature. We will discuss historical pattern poetry, contemporary artists’ books, Dadaist poetic performances, French sound poetry, German concrete poetry, Pre-Raphaelite poems for pictures, as well as recordings of Eliot, Wat, Milosz, and Brodsky. We will find these works in the collections of Harvard libraries, and in diverse Internet visual and sound archives. We will ask about the limitations and benefits of the use of digital tools in humanities. On one evening, we will participate in a poetry reading in Cambridge.

THE POETRY OF ELIZABETH BISHOP AND SYLVIA PLATH
Peter Sacks (Department of English)

Freshman Seminar 6oM  4 credits (spring term)  Enrollment: Limited to 12

This seminar studies in detail the poetry and prose of two of the most significant American poets of the mid- to late 20th century, Elizabeth Bishop and Sylvia Plath. While the intention will be to gain some general knowledge of lyric poetry, readings will focus closely on the works of these two quite different poets. We shall examine their entire poetic oeuvres, while also reading selections of their prose writings (fiction, letters). Issues of self-presentation, expatriation, loss, vocation, memory, gender and sexuality, as well as techniques of description and expression—these will recur throughout the readings. Other poets may be added for context. While acknowledging the differences between the principal poets (e.g., the oblique self-portraiture of Bishop as opposed to the more direct “confessional” style of Plath), we shall also seek common motifs, both in their situations as writers and in their achieved poems.
THE PROBLEM OF ECONOMIC DEVELOPMENT
Michael Kremer (Department of Economics)

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

**Prerequisites:** Students are expected to have had some background in economics, such as an AP economics course in high school, or simultaneous enrollment in Ec10A or Social Analysis 10.

Understanding the determinants of the wealth of nations has long motivated the study of economics and it is arguably the most important problem in the field for human welfare. This seminar will examine the problem of economic development, looking both at historical experience and at contemporary issues in developing countries. It will focus on writing in economics, but will also draw on other disciplines, including history, political science and sociology. The course will start with readings of Adam Smith, Karl Marx and Max Weber. Participants will then read non-technical works illustrating some of the techniques and modes of reasoning associated with contemporary microeconomics and statistical analysis. Finally, it will conclude with contemporary writing on development, including work that addresses big-picture political economy models of the role of institutions in development, a historical account of India since independence, and more microeconomic approaches.

PSYCHOACTIVE MOLECULES FROM BABYLON TO BREAKING BAD
Jon Clardy (Harvard Medical School)

Freshman Seminar 22C  4 credits (fall term)  Enrollment: Limited to 12

**Prerequisite:** This seminar will be geared toward students with a background in chemistry and biology.

Psychoactive molecules change brain function in ways that result in altered perception, mood, or consciousness, and while “psychoactive” hints at something illicit, examples range from caffeine to cocaine. After an introductory session, the seminar series begins with two meetings focused on foundational principles of brain chemistry. Subsequent meetings address four important molecular families: opioids, molecules like heroin, codeine, and Oxycontin; cannabinoids, molecules like THC, the active ingredient in marijuana and anandamide, our body’s version of THC; serotonin, a neurotransmitter regulated by antidepressants like Prozac, Cymbalta, Celexa, and Wellbutrin XL; and amphetamines, molecules like Albuterol, Adderall, XTC/Molly, and crystal meth. Our meetings will use case studies from recent newspaper, magazine or popular science articles to explore larger questions about how these substances were discovered; how they alter our brain chemistry; how they are used, abused and viewed today; and what they have taught us about how our brains work. These explorations often lead to unexpected connections. For example, the three seminars on opioids also explore our brain’s reward system; the nature of addiction; the connection between opioids, alcohol abuse, and genes; and the connection between opioid sensitivity and human bonding.
PSYCHOLOGY OF RELIGION
J. Wesley Boyd (Harvard Medical School)

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

This course 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 course 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 course 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 course 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 of 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.

PUBLIC POLICY APPROACHES TO GLOBAL CLIMATE CHANGE
Richard Cooper (Department of Economics)

Freshman Seminar 44G  4 credits (spring term)  Enrollment: Limited to 14

After a review of what is currently known about greenhouse gas emissions’ possible impact on the climate and of how such knowledge is acquired, the seminar will explore the possible impact of climate change on social and economic conditions over the next century. Participants will investigate possible public policy responses to these developments, including actions both to adapt to and to mitigate climate change. What would be the costs of adaptation? Would an investment in mitigating the changes be worthwhile? The seminar will also address the requirements and possibilities for international cooperation in dealing with the problem of global climate change, the solution to which transcends national boundaries and competence. Throughout, the seminar will emphasize the analysis of complex problems in public policy. Members of the seminar will be exposed to concepts of cost-benefit analysis and considerations of uncertainty in decision-making. The seminar will rely on student research.
QUANTUM ENTANGLEMENT
Subir Sachdev (Department of Physics)

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

Prerequisites: A background in AP Physics would be helpful. Complex numbers and vector spaces will be employed, but a full course in linear algebra is not a prerequisite. The seminar will begin with discussion of the basic needed axioms of linear algebra.

Quantum mechanics was discovered in the early 20th 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”: That 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 described 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.

QUANTUM MECHANICS FACE TO FACE
Melissa Franklin (Department of Physics)

Freshman Seminar 22S  4 credits (spring term)  Enrollment: Limited to 12

This course is for students who would like to be introduced to the ideas of quantum mechanics without the rigor of mathematics, but who would be interested in learning by demonstration as well as spoken word and picture. We will be guided by a non-mathematical text, *Introducing Quantum Theory*, read short pieces by the creators of quantum theory, including Bohr, Einstein, Heisenberg and Schrodinger, and each week watch and play with physics demonstrations of wave and particle physics. This course requires reading, watching short films, watching demonstrations in the lab and visiting places at the university where quantum mechanics is used on a daily basis.
RESEARCH AT THE HARVARD FOREST—GLOBAL CHANGE ECOSYSTEM: 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 to 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, Massachusetts. 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 global change. The seminar consists of four weekend-long field trips (Friday evening to 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 course 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.

RESPONSIBILITY, THE BRAIN AND BEHAVIOR
Ronald Schouten (Harvard Medical School)

Freshman Seminar 25W 4 credits (fall term)  Enrollment: Limited to 11

Prerequisite: There are no prerequisites, but an interest in law, psychology or related fields would be advantageous.

Note: The seminar may include an optional trip outside of class time to Bridgewater State Hospital, Massachusetts’s maximum security forensic hospital. Transportation will be provided free of charge.

The individual’s responsibility for his or her behavior is a subject of constant inquiry in our society. This seminar will explore the philosophical, legal and clinical bases of the concept of individual responsibility in civil and criminal law. We will examine how forensic mental health professionals assess an individual’s mental state at the time of an alleged act, the legal standards applied, and the social and political forces that help to shape legal decision. In the process, students will consider historical and modern examples of the insanity defense, including modern attempts to expand the range of disorders offered as a basis for an insanity defense. The seminar will examine modern concepts of the biological basis of behavioral disorders and their relationship to existing standards of criminal responsibility.
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, and so on. Markets under-provide public goods, and they also do not work well in the presence of externalities, a highly topical example being global warming that results 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 that, 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.

THE SCIENCE OF CATS
Jonathan B. Losos (Department of Organismic and Evolutionary Biology)

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

This seminar will focus on how scientists are using state-of-the-art methods from the fields of evolutionary biology, ecology, behavior and molecular biology to understand Felis catus, the housecat. Questions we will examine include: From what species was the housecat derived and when and where did domestication occur? Is the housecat actually domesticated and, if so, how did that happen? Is the behavior of housecats a legacy of their evolutionary past, or does it represent adaptation to living with humans? What effect do housecats and their feral relatives have on local ecosystems? What is the history of cat breeds, and how are new ones developed? Is there anything useful to be learned by comparisons with—shudder—dogs? We will also consider the role of cats in art and human culture. We will approach all of these questions not only through readings, but also by field trips to museums and local cat events (film festivals, cat shows), laboratory genetic exercises sequencing cat DNA, and behavioral studies using kitty-cams.
Students entering the Class of 2020 likely can’t remember a time before the terrorist attacks of 9/11 and the global responses they triggered. Nor can they imagine a world before the Internet, social media, and interactive videogames, a world not immersed in images of sex and violence—a time more innocent, perhaps, yet surely more repressive. Social and cultural revolutions have upended conventional understandings of family, sexuality and intimacy. Scientific revolutions and technological innovations have provided new opportunities for communication and connection, even as they have created new mechanisms for surveillance and control—at once improving democratic accountability and yet strengthening the state’s grip and the prospects for tyranny. Today’s citizens must make tough choices about how to balance security and freedom, how to navigate a rapidly changing high-tech universe, and how to shape their personal lives and construct their families. Yet, as novel as these choices may be, their exercise is constrained by a legal system built on a Constitution that emerged from the social and political conflicts of eras long past. Adapting the words of this Constitution and the values it embodies requires analyzing the blend of politics and law practiced in and by the United States Supreme Court. This seminar, drawing on judicial opinions and secondary sources, will explore how our most basic legal framework, that of the U.S. Constitution and the law surrounding its interpretation and implementation, shapes and is shaped by modern forces battling for the character of the national soul.

Since the arrival of Africans from Africa to America, their health and healthcare has been a critical issue for the nation. From the era of slavery to the present, African Americans have been disproportionately burdened by disease and ill health. Health disparities are the “inequalities that occur in the provision of healthcare and access to healthcare across different racial, ethnic and socioeconomic groups.” This course examines this issue over the long time frame, from the 17th century to the present. Currently, compared with the white population, African Americans are at an overall greater risk for many serious and life-threatening diseases. This course will examine how these disparities emerged over time. It will explore the strategies and practices that African Americans employed to improve their healthcare. It will also examine the ways that cities, states and the federal government supported or ignored the health of African Americans.
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.

SLAPS AND EMBRACES: HOW TO READ IN A MINOR(ITY) KEY
Doris Sommer (Department of Romance Languages and Literatures and Department of African and African American Studies)

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

Almost always, we learn to read literature and the world through a framework that assumes reader and writer will share a common language, with its particular references and values. Classical rhetoric encourages us to get to understanding or even agreement that outsiders are invited in through uses of language that we can or already do share. This equal grounding has morphed in modern times into a universalism among educated readers. It amounts to assuming that all people are fundamentally equal and, therefore, understandable to one another. The rhetorical devices and interpretive frames that we have inherited from the classics, therefore, seem adequate today, too. But minority writers, by definition, cannot assume continuity with the majority of readers and, therefore, the tropes, strategies and styles developed in “mixed company” are significantly different from those we have learned to expect. These stylistic differences, which mark cultural distances, make ethnically marked writing distinctive. It often teases readers with promises of intimate unveiling and then turns the page onto a freshly felt distance. As Toni Morrison says about her own writing, “it slaps and embraces.” We become better readers and better citizens in an ever-more culturally complex world, as we learn to recognize the clever moves that are not always meant to affirm an expectation of our mastery. Assignments include weekly response papers on readings and a final paper.
SOCIAL SCIENCE AND AMERICAN SOCIAL PROBLEMS
Mary C. Waters (Department of Sociology)

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

This course will examine nine major social problems facing the United States today: income inequality, political polarization, race, immigration, poverty, education, incarceration, work and family, and climate change. We will read leading social science books and articles that define the problems, discuss their causes and consequences, and propose solutions. We will focus on how social science research from the disciplines of sociology, political science, economics and psychology measure and track changes in these areas. Because there will be a presidential election occurring, we will spend some time discussing how the candidates differ in positions on public policies addressing these problems and how their platforms and positions use social science research. The class will collectively decide on three other problems we should learn about, and three teams of four students each will prepare a presentation and paper on the topic. The final paper will take the form of a memo to the incoming new president.

THE SURPRISING SCIENCE OF HAPPINESS
Nancy Etcoff (Harvard Medical School)

Freshman Seminar 24K  4 credits (spring term)  Enrollment: Limited to 15

After a century of studying how to cure mental illness, scientists have started to explore what makes us happy. What have they discovered? In this course, we will critically examine the findings from the new science of happiness, including research in cognitive science, evolutionary biology, psychology and neuroscience, and reveal how this work alters our understanding of what happiness is, the optimal ways to achieve and increase it, the role of circumstance in its occurrence, its effect on our physical health, and its place in human nature. We will consider the notion of a biologically determined “hedonic set point,” and question whether there are people who “have started in life with a bottle or two of champagne inscribed to their credit; whilst others seem to have been born close to the pain threshold,” as William James noted over a century ago. We will examine how the brain’s reward circuitry generates feelings of pleasure, desire, comfort and craving, and the ways it propels us to achieve biologically significant goals. Among the questions we will consider are: What is happiness for? Can one make oneself happier by conscious effort? What are some of the myths about happiness? Finally, is happiness a worthy goal for one’s life? Highlighting the most rigorous and promising work in this field, we will attempt to construct a “happiness toolkit.” The course will be didactic, interactive and experiential and provide an introduction to a burgeoning field of scientific inquiry.
TECHNOLOGY TO SAVE THE WORLD
Latanya Sweeney (Department of Government)

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

Technology designers are the new policy makers. No one elected them, and most people do not know their names, but the arbitrary decisions they make when producing the latest gadgets and online innovations dictate the code by which we conduct our daily lives and govern our countries. As technology progresses, every societal value and every state rule comes up for grabs and will likely be redefined by what technology enables or not. No one is thinking about how it all fits together or falls apart. This class is a hands-on lab exploration to reveal unusual and insightful ways technology is changing our world and what we, in our lab course, can do to shape that change.

TELL A PERSONAL STORY THROUGH SOUND
Hans Tutschku (Department of Music)

Freshman Seminar 60F   4 credits (spring term)   Enrollment: Limited to 12

Through the creation of a personal sound story, students are invited to discover new forms of communication and relating ideas. Perception of sound, as well as its creative use will be at the core of our discussions. We will learn to shape sound in order to express specific ideas. Each student will write a personal short story as a script. Those stories don’t focus on the visual aspects of things, but describe the sounding scenes and spell out the sounding environment and qualities. There are no prerequisites in music. An open-minded, creative and curious attitude is expected. We will listen to the weekly assignments in class and develop a specific form of group critique. The final sound story compositions will be presented in a public listening session. Each student is required to bring his or her laptop and headphones to class. We will use the software, Reaper, for editing and a cheap but powerful sound editor, Twisted Wave for Macintosh.
THE TEMPORAL UNIVERSE
Jonathan E. Grindlay (Department of Astronomy)

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

Note: This seminar is open to all but may be of particular interest to those considering physical science 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 giga-years for galaxies to milliseconds for collapsed stars (neutron stars and black holes). In this seminar, we shall explore stars and 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 an example of each of these two types of variable stars 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 of this object on thousands of glass-plate images taken by Harvard telescopes from 1885 to 1992 and now digitized and online 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 book Black Hole (Bartusiak). 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.

THINKING ABOUT THE UNTHINKABLE: FROM THE 18TH-CENTURY CULT OF FEELING TO THE HOLOCAUST
Rita Goldberg (Department of Comparative Literature)

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

This course is about remembering, responding to and reflecting about experiences that we describe as unspeakable or unthinkable, yet that somehow must be expressed in language, because language of one kind or another is all we have. We’ll explore some literary moments centered largely on young people in bad situations, starting in the mid-18th century, when writers became obsessed with the feeling response as a measure of virtue (often manifested in tears), and continuing with readings of Blake and Dickens. In the second half of the course, we’ll turn to memory, as expressed in the form of the memoir. We’ll start with two memoirs of slavery by Frederick Douglass and Harriet Jacobs. We will spend another few weeks on memoirs of the Holocaust by people who were children in those years, and we’ll look at Freud and other more recent writers on trauma and memory. Students will be expected to participate actively in the seminar, to write a page or two weekly on the readings, and to be responsible for opening one week of discussion. There will be a short concluding paper. It will not be all darkness and gloom. Hovering over the course is the spirit of Anne Frank and the sense that even in these darkest of narratives, the flame of life can continue to burn, and that words can recover their power, especially for the young.
TIME FOR SLEEP: IMPACT OF SLEEP DEFICIENCY AND CIRCADIAN DISRUPTION IN OUR 24/7 CULTURE
Charles A. Czeisler (Harvard Medical School)

Freshman Seminar 22D 4 credits (fall term)  Enrollment: Limited to 12

America is a sleep-starved nation. The Institute of Medicine estimates that between 50 million and 70 million Americans are suffering from chronic sleep deficiency or sleep disorders, increasing their risk of weight gain, heart ailments, mood disorders, errors and catastrophic road accidents that kill more than 7,000 and maim more than 50,000 Americans annually. Children of all ages are sleeping about two hours less per night than they did in prior generations, rendering them hyperactive and irritable and compromising their ability to sustain attention and learn in school. This hyperactivity leads many sleep-deprived children to be misdiagnosed with ADHD and treated for years with amphetamines and other stimulants that further disrupt sleep. Yet, prevailing cultural attitudes lead us all to undervalue sleep and lionize all-nighters, such that most patients with sleep disorders remain undiagnosed and untreated. This seminar will explore the function of sleep, the physiologic factors that regulate sleep and circadian rhythms, the impact of exposure to artificial light on sleep and circadian rhythms, historical and cultural differences in sleep habits, and the consequences of sleep deficiency, circadian disruption and sleep disorders on both the brain and the body. Public policy issues, such as school start times, limits on resident physician work hours, drowsy driving laws, and proposed regulations to screen transportation workers for sleep disorders will be debated. Students will be encouraged to track their own sleep patterns throughout the semester, identify the personal, structural and cultural barriers to maintaining healthy sleep while in college, and propose strategies to improve sleep health at Harvard College, the local community and the nation.

TO FAR PLACES: LITERATURE OF JOURNEY AND QUEST
William A. Graham (Department of Near Eastern Languages and Civilizations)

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

In this course, we read a highly diverse group of engaging texts in English translation. Most are fictional, mythic, or epic texts. All engage the theme of journey, quest, pilgrimage, passage, or sojournning. We will be attentive to enduring themes and basic questions associated with this varied literature, including parting and return, separation and reintegration, homelessness and homecoming, epic adventure and exploration, trial and suffering, loss and recovery, heroic action, tragedy, pathos, orientation and disorientation, internal and external travel, faith and courage, aesthetic vision, heightened perception, self-discovery and growth, companionship, loneliness, risk, and death. Readings will be selected from among the following: Gilgamesh, J.R.R. Tolkien’s Hobbit, Homer’s Odyssey, Virgil’s Aeneid, Matsuo Basho’s Narrow Road to Oku, Hermann Hesse’s Siddhartha, Thomas Mann’s Death in Venice, Rudyard Kipling’s The Man Who Would be King, Ashvagosha’s Life of the Buddha, Shusaku Endo’s Deep River, Annie Dillard’s Pilgrim at Tinker Creek, John Hersey’s A Single Pebble, Charles Frazier’s Cold Mountain, Fariduddin Attar’s Conference of the Birds, Naguib Mahfouz’s Journey of Ibn Fattouma, Cormac McCarthy’s The Road, Rachel Joyce’s The Unlikely Pilgrimage of Harold Fry, and Italo Calvino’s Invisible Cities.
TOPICS IN INDO-TIBETAN BUDDHISM
Leonard van der Kuijp (Department of South Asian Studies)

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

Through the study of Tibetan Buddhism, the members of the seminar will consider important issues of cultural contact by investigating a series of interrelated topics that have played a significant role in Tibetan history and that are connected to Tibet’s acculturation to Buddhism in the 8th and 9th centuries. Which aspects of Tibetan Buddhism are indigenous? Which were imported with Buddhism itself from China and India? The seminar will seek to answer these questions through the study of several historical aspects of Tibetan society including the different narratives of Tibetan kingship, the formation of schools of Buddhist thought, the transmission of texts, scholastic loyalty, monasteries and their inhabitants, the appearance of Buddhist mysticism in the Tantra, and reincarnation—one of the defining features of Tibetan Buddhism. After developing a sense of the historic role of Buddhism in Tibetan life, the members of the seminar will consider the role of Buddhism and the Dalai Lama in contemporary Tibetan culture and society.

THE TRANSFORMATION OF MARKETING
Elie Ofek (Harvard Business School)

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

Marketing, as you will find in this seminar, refers to the set of analyses and activities needed to form and sustain a healthy business by fostering meaningful exchanges between the organization and its chosen customers. Marketing helps create value for consumers and extract a share of that value for the organization. We will spend time understanding the fundamentals of marketing management and examine how recent economic, technological, cultural and societal developments have affected the field of marketing. In particular, we will first cover the central themes of customer behavior, strategic marketing analysis, innovation forecasting and brand management. Then we will explore how marketing has dramatically evolved in recent years due to: the digital and social-media revolution; firms’ desire to globalize and the cross-cultural challenges this entails; the increasingly complex and consumer-oriented healthcare setting; and societal trends calling on companies to exhibit greater social responsibility. We will close the seminar by examining issues of public policy and marketing leadership. In examining these themes, we will often draw upon concepts and research from the domains of psychology, sociology and economics. Each session will have assigned pre-readings that may include book chapters, articles, case studies and exercises. The discussion and material covered in class will rely upon these readings. Each student will be asked to prepare two short write-ups to be delivered during the term and a final paper. The paper requires students to identify a current business phenomenon and analyze it through the theories, perspectives and frameworks developed during the seminar.
TRANSFORMATIVE IDEAS IN BRAIN SCIENCE: WAR, TECHNOLOGY AND DISEASE-MOTIVATED DISCOVERY, HISTORICALLY AND TODAY

Jeffrey D. Macklis (Department of Stem Cell and Regenerative Biology (FAS) and Harvard Medical School)

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

This seminar will offer an integrated historical-neurobiological-neurological introduction to foundational and transformative ideas in the ~3,700-year history of brain science, neuroscience and “lay” neurology—all accessible to freshmen with interests from history, art, and literature to economics, social policy, and business to neuroscience and (molecular, developmental, organismic, evolutionary or regenerative) biology. No background will be assumed. Rather, a series of historical vignettes and sources will be tied to modern understanding of elements of the nervous system, its organization, function, and modes of investigation and manipulation—and some historical contexts, often involving war, disease, serendipity, and technology advancement, will be highlighted as advancing knowledge in surprising ways. An interdisciplinary approach will benefit from each student bringing insights from their own reading of primary source and history of science texts, to be added to in-session discussion, with moderation and direction from me. We will visit a number of the Harvard Collections and museums, including Comparative Zoology, Herbaria, History of Science, the HMS Warren Anatomical Museum collection (Phineas Gage’s skull and railroad tamping rod), the Harvard collection of historical scientific instruments (e.g., advances in microscopy, electrical measurement), and the state-of-the-art Center for Brain Science imaging facility, providing context.

TRIALS FROM ANCIENT ATHENS

Adriaan Lanni (Harvard Law School)

Freshman Seminar 31P  4 credits (fall 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. Although Athens is often praised for its participatory political institutions, the best-known example of Athenian justice is an embarrassment: the trial and execution of Socrates. Was the Athenian legal system a shining example of the potential of popular, democratic justice, or a cautionary tale suggesting that law is best left to experts? We will evaluate Athens’ distinctively amateur legal system by reading surviving court speeches involving homicide, assault, adultery, prostitution, slander, treason, citizenship, property 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 (rape, adultery, prostitution, homosexuality), the trial jury, court procedure, and commercial law. Taught by a law professor, the focus will be on comparing ancient and modern approaches to problems faced by all legal systems. The broader goal will be to explore the role of law in a democratic society. Students will be expected to write one five-page paper, to contribute to and lead one class discussion, and to participate in a “mock trial” of an Athenian homicide case.
UNHAPPILY EVER AFTER: LOVE’S UNHAPPY ENDINGS, À LA FRANÇAISE
Annabel Kim (Department of Romance Languages and Literatures)

_**Freshman Seminar 60P**  4 credits (fall term)  Enrollment: Limited to 12_

**Note:** The course is conducted in English with all works available in English translation. Students with a high enough level of French will have the option of reading the works in the original French.

From Pépé le Pew to Robert Doisneau’s iconic photograph of a couple kissing by Paris’s Hôtel de Ville (City Hall), the French have a privileged relationship to love and romance that few countries can rival: French is the language of love, Paris is the city of light and lovers, seduction is a French art, and so on. And yet, for a culture that is so love-centric, the French love story rarely ends well. Indeed, French literature could be described as an enormous lonely hearts club, with one story of love and loss after another. In this seminar, we will retrace the long and venerable history of broken hearts, from the Middle Ages to today; and as we move from one ruined life to the next, we will be able to unpack such weighty and historically contingent concepts as love, desire, morality, sexuality, gender, race, class, and how they transform and are transformed by writing. Authors read will include Madame de la Fayette, George Sand, Gustave Flaubert, Marcel Proust, and Marguerite Duras, among others.

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 20th century: quantum mechanics and general relativity; and then it will investigate the key concepts that separated these developments from the physical theories that 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.
THE U.S. ENERGY REVOLUTION AND ITS IMPLICATIONS
James H. Stock (Department of Economics)

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 10% reduction in U.S. carbon dioxide emissions, and economic growth. This course examines the changing U.S. energy landscape, energy security, U.S. climate policy, and the connection between these issues and our own lives. 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 course starts by looking at our—your—energy and carbon footprint, how much it can change, and how it connects with broader issues of energy markets, energy security and climate change. The course then dives into three current policy issues: biofuels, the mining of coal from public lands, and the regulation of CO2 emissions from fossil-fuel-fired power plants. In each case, critics complain that these policies are expensive, ineffective, or have unintended consequences, while others complain that they don’t go far enough given the magnitude of the challenge posed by climate change, and we will evaluate these arguments.

VISUALIZING THE DIVINE IN ANCIENT POLYTHEISTIC CIVILIZATIONS: DIVINE IMAGES AND THEIR WORSHIP IN MESOPOTAMIA, EGYPT AND INDIA
Piotr Steinkeller (Department of Near Eastern Languages and Civilizations)

This seminar will focus on the modes of representing the divine in the ancient civilizations of Mesopotamia, Egypt, and India. Through the use of rich iconographic data and the relevant ancient texts (in English translation) the members of the seminar will study the ways in which the Mesopotamians, Egyptians, and Hindu conceived of the divine and represented it visually. We will begin by asking what is the meaning of “divine” and “deity” in a polytheistic religious system, and how, in particular, were these two concepts understood in Mesopotamia, Egypt and India; and what makes divine images special and unique, and how do they differ from other types of visual representations. We will then systematically study the ways of representing the divine in the three civilizations in question, and observe how divine images functioned in religious praxis. The seminar will finally consider the issue of iconoclasm as a recurring historical phenomenon: from the Biblical injunction against “graven images,” through the early Christian and Islamic polemics against the use of divine representations, down to the destruction of the “idols” by the Taliban and ISIS in our own time.
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 COLLEGE AND WHAT IS IT FOR?
Paul J. Barreira (Harvard Medical School and Faculty of Arts & Sciences)

Freshman Seminar 30O  4 credits (spring term)  Enrollment: Limited to 12

In the fall of 2012, more than 20 million students enrolled in U.S. colleges and universities. Who are these students, and why do they go to college? What are they seeking? This seminar asks students to think and write critically about higher education, considering, in Clark Kerr’s famous phrase, “the uses of the university,” from a variety of perspectives: historical, sociological, economic and developmental. As they do so, the seminar will address the questions that have faced students, administrators and public legislatures for over three centuries: What constitutes a liberal arts education? What are its goals? How should students be assessed? What role does extracurricular life, such as sports and fraternities and sororities, play in a college education? Does a college degree certify a vocational education, an intellectual one or a moral one?

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.

**WHAT IS THE INTERNET, AND WHAT WILL IT BECOME?**


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

The Internet has become a central part of our everyday life, a conduit for commerce, and part of the connecting tissue of our social networks—from email to the World Wide Web to the way we get entertainment, run video conferences, shop, or find information. But what, exactly, is the Internet? Who runs it, how did it happen, and what is its future? How does it change our way of finding information, of working, or of seeing the world? What are the trends in technology, policy and law that will form the Internet and, by extension, our lives going forward? This seminar will look at all these questions, and some others. We will start by looking at the history of the Internet—how it happened, what design choices informed its construction, and how the various standards that define this network of networks were decided, adopted, and enforced. We will then look at various controversies that center on the current Internet, including issues like who should govern it, what influence national laws should have on this seemingly borderless entity, and the role of encryption in communication, security and privacy. We will then turn to some possible futures, and the implications of these futures on the way we live our networked lives. Will the Internet change the way we work? The way we vote? The way we think? This course does not presuppose any knowledge of how the Internet works or how it is governed. While there will be some discussion of the technical aspects of networking, computer hardware, and computer software, all that will be needed to understand the issues will be presented as part of the seminar.
WHEN BAD THINGS HAPPEN EARLY IN LIFE:
THE EFFECTS OF EARLY ADVERSITY ON BRAIN
AND BEHAVIORAL DEVELOPMENT
Charles Nelson (Harvard Medical School, Harvard T.H. Chan School of
Public Health, and Harvard Graduate School of Education)

Freshman Seminar 43F 4 credits (spring 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 to which children are exposed; 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.

“WHERE ARE YOU FROM?” ANCESTRY IN THE AGE
OF GENOMICS
David 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?
WHERE DO WE COME FROM? WHAT ARE WE?
WHERE ARE WE GOING?
John Huth (Department of Physics)

This seminar explores the human sense of “place” in spatial, personal and social contexts. Starting from considerations from the neurosciences and cognitive psychology, we first examine local space: how we orient ourselves where the universe is a plane dividing land and the sea from the sky. The correlation of spatial and social consciousness is explored—how the language of spatial orientation becomes a metaphor for social structure and how people lead their lives. The metaphor of journey as life has a neurological basis. We examine conceptions of the sky and earth in a number of cultures, including cosmographies. As a turning point, we examine Dante Aligheri’s *Paradiso* as a window into the concept of the universe in Medieval Europe. Beyond that, we examine the emergent view of the solar system and the concept that physical nature on earth is the same as in the sky (Newton). Since Newton, astronomy and physics have combined to create an expanding vision of space and time that stretches the human capacities to envision the universe. We look at how Einstein’s special relativity mixed space and time, and the emergence of the cosmological principle in an expanding universe. We survey the current knowledge of the structure of the universe, including the possibilities of multiple universes and what that might imply. Coming full circle, we explore whether scientific constructs in quantum mechanics and the cosmological principle can also be employed as meaningful social metaphors.
**WHITE COLLAR BLUES?: WORK IN THE AGE OF FLEXIBLE CAPITALISM**

Rachel Meyer (Department of Sociology)

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Does flexible work lead to liberation or loss of identity? Does it bring self-fulfillment or insecurity? This course will examine the ways in which workers’ connections to employers, occupations and locations have become more fluid and transitory, and we will critically engage in the debate about the social and personal consequences of such “flexible” labor. We will investigate what flexibility means in a variety of economic sectors and occupations, exploring the experience of work in the contemporary political economy with an eye toward both its liberating and oppressive potential. How do different forms of work affect our personalities, life circumstances, and connections to each other? What is meaningful work? Our approach will be rooted in the crucial question of workers’ control over their own labor, and we will explore this through case studies. What does flexibility mean for tech workers in Silicon Valley and bankers on Wall Street? Throughout the course, we will pay particular attention to occupations where social class is ambiguous or problematic, leading us to the question: what does it mean to be a worker vs. a professional? In examining the labor process under modern capitalism, we will focus on both its structural aspects as well as on culture, ideology and identity. And we will examine how the workplace intersects with gender, the family and one’s experience outside of the factory gate or office cubicle. We will read prominent social theorists along with a variety of ethnographic accounts that in different ways seek to elucidate the conditions of work under modern capitalism.

**WHY WE ANIMALS SING**

Brian D. Farrell (Department of Organismic and Evolutionary Biology)

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We do not sing alone. On land, four kinds of animals produce songs or calls: birds, frogs, mammals and insects. Some of these (and fish) also do so underwater. The principal sounds such animal species make are signaling behaviors directly related to mating success. They are of individuals, usually males, marking territories and wooing mates. However, in any one location, species may also compete with one another for occupation of acoustic space (that is, for bandwidth) and otherwise optimize their sound signals to features of their environment. We will explore these topics and others as we listen to and read about each of the various kinds of singers on earth, the biology of their sound production and reception, and the ways they attract mates while avoiding becoming meals for eavesdropping predators. We will listen to many different kinds of acoustic signalers across a wide array of acoustic communities in tropical and temperate settings, both terrestrial and aquatic, and we will examine sound spectra on a large screen as we listen and slow down and isolate sounds to help distinguish their parts. Finally, we will consider the biology and evolution of music in humans, considering evidence from brain studies, archaeology and anthropology, and the music of indigenous peoples. We will look at music parallels in different kinds in animals of other species. There will be field trips to listen to and record assemblages of local species. The overall objective is to awaken the students’ sense, understanding and appreciation of the acoustic environment from which we come, and the role of this environment in shaping human biology and culture. There is a fair bit of reading required in preparation for weekly discussions. Accordingly, participation will be expected for discussion of the readings and listening experiences.
WORK: AN AUDIO/VISUAL EXPLORATION
Robb Moss (Department of Visual and Environmental Studies)

Freshman Seminar 38X  4 credits (fall term)  Enrollment: Limited to 10

Note: No previous production experience is necessary to take this class, and the class can be considered a gateway course for admission into the Department of Visual and Environment Studies.

What is work? Something we do to earn a living? Is rehabbing from a sports injury work? Raising your children? Mowing the lawn? Does intellectual work have the same quality as physical labor? What do we mean when we refer to a painting as a “work of art,” or a certain kind of person as “a piece of work?” This course will explore the nature of work through audio and video recordings, film screenings, readings and journal writing. Central to the idea of the class is that, through its filmmaking efforts, students will get off campus and explore the larger community of Cambridge. Issues of class, race, storytelling and abstraction will also be explored.

YOU AND YOUR CAMERA
Peter S. Pershan (Harvard John A. Paulson School of Engineering and Applied Sciences SEAS)

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

Prerequisites: Ideally students should have 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 that do not own one.

The goal of representing the three-dimensional world on a two-dimensional surface dates back at least 30,000 years. For nearly all of these past centuries, there were relatively few people who had the talent to create realistic two-dimensional images of the people and things that wanted preservation. Although photography has changed that, there are still significant differences between the images that most people create and the photographs of leading photographers. The hope is that this seminar will give students the tools to improve their photographs. After a brief review of the historical review of art and photography, the seminar will proceed to discuss the components of a modern camera, what the components are and how they work. Topics to be covered include both the physical optics of simple and compound lenses as well as the quantum physics that is the basis of the electronic devices that are fundamental to digital photography. The differences between the RAW, JPEG and TIFF methods for storing digital photographs will be discussed, along with artifacts, such as the aliasing that can arise in the digitization of images. Exercises will include, among other things, how to manipulate images using the open source GIMP software. An essential issue for color photography is the manner in which the human visual system transforms the wavelength information in the light entering the eye into perceptions of color. The seminar will explain the trichromatic theory of color vision and then discuss the management systems for color printing.
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