FRESHMAN SEMINAR PROGRAM
2019-2020

Faculty of Arts and Sciences
Harvard University
Class of 2023,
Welcome to the Freshman Seminar Program, one of Harvard College’s finest jewels.

Since its inception in 1959, our program has provided Harvard students 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 124 Freshman Seminars that will be offered in 2019–2020. As you will see, the range of seminars is spectacular: They offer you an exceptional introduction to every corner of the University, and they are taught by some of Harvard’s most distinguished faculty members. There is probably no finer way to explore new interests—or expand on existing passions—than by enrolling in a freshman seminar.

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

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

Ofrit Liviatan
Director, Freshman Seminar Program
WHAT DO STUDENTS THINK?

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.

When people were telling me that the freshman seminars will be the best academic experience of the first year, I did not believe them. However, this seminar proved me wrong…I couldn’t emphasize more how GREAT this seminar and the professor were. If you are thinking whether to take this class—the answer is definitely YES. It will improve your first-year experience twofold.

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.

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

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.

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

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

This class is absolutely incredible, and has changed my perspective on my future career plans. The professor is highly knowledgeable about her field and is enthusiastic about teaching...

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.
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Catherine Brekus’s seminar at Andover-Harvard Theological Library, HDS (Antoinette Trainor-FSP)
Final presentations for Jill Lepore’s seminar at Bok Center’s Learning Lab (Nina L. Duncan-FSP)

DIRECTOR’S LETTER:
Ofrit Liviatan (Alessandro Vaccaro)

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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 who do not perform satisfactorily will be excluded from the seminar and/or denied credit. Seminar instructors report in writing on each student’s performance in a seminar; these reports are available to the student through established procedures.

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

APPLICATION AND ADMISSION

Applications to the Freshman Seminar Program may be submitted electronically through a Web-based system starting on Thursday, August 1, 2019. Information about applying to fall-term seminars is available on the Freshman Seminar Program website (www.freshmanseminars.college.harvard.edu) or from the Freshman Seminar Program Office (617-495-1523). Applications will be accepted until 3:00 pm on Wednesday, August 28, 2019, and students will be notified of their placement on Friday, August 30, 2019. Applications for spring-term seminars may be submitted starting in December.

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

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

For further information, please contact the Freshman Seminar Program Office:
1414 Massachusetts Avenue, 3rd floor, Harvard University, Cambridge, MA 02138
Email: seminars@fas.harvard.edu
Telephone: 617-495-1523
Website: www.freshmanseminars.college.harvard.edu

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

PLEASE NOTE: The most up-to-date list of seminars and meeting times can be viewed on our website at www.freshmanseminars.college.harvard.edu.
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ADVICE TO YOUNG LEADERS
David R. Armitage (Department of History)

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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 freshman 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 eighteenth, nineteenth, and early twentieth centuries.

ALL OF PHYSICS IN 13 DAYS
John M. Doyle (Department of Physics)

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Prerequisite: Please note that this seminar will be geared to students likely to go on in 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 seminar on the subject in the future. This seminar 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 these and 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 (spring term)  Enrollment: Limited to 15

Prerequisite: High school science.

Note: The class will run only 2 hours within the time block. Professor Dowling especially invites those students who are not planning to concentrate in neurobiology or a natural science to join the seminar.

What makes us human and unique among all creatures is our brain. Perception, consciousness, memory, learning, language, and intelligence all originate in and depend on the brain. The brain provides us with wondrous things, from mathematical theories to symphonies, from automobiles and airplanes, to trips to the moon. But when it goes awry, we are undone. (From “Understanding the Brain”)

This seminar will be an introduction to our present understanding of neural and brain function. It is designed for students not planning to concentrate in neuroscience, but who enjoy science and are curious about the brain. We will read from my recently published book Understanding the Brain: From Cells to Behavior to Cognition that is accessible to anyone with a high school science background. Each chapter begins with a vignette, usually about a neurodegenerative or other brain disorder that is then explained further in the chapter.

THE AMAZON: ECOLOGY, NATURE AND SOCIETY IN THE WORLD’S LARGEST RAIN FOREST
Gary Urton (Department of Anthropology)

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

The Amazon rain forest of South America is the most diverse place on earth in terms of its rich and varied plant and animal life. Nonetheless, the Amazon is threatened today by climate change, illegal logging and mining, and a host of other forces that are diminishing the health and diversity of the forest and its people. This seminar will consider the Amazonian region from the past to the present, as well as its prospects for the future. We will explore such topics as how indigenous Amazonians have adapted to and made use of the resources of the rain forest from pre-European contact times, through colonial rule, and down to the present-day in Brazil and the other nations containing portions of the Amazon watershed. We will explore how Amazonian peoples have formed societies, made a living, understood the relationship between humans and animals, engaged in ritual and ceremonial practices for maintaining the forest and managing relations with neighboring peoples, and how the encroachment of outsiders is threatening the sustainability of the forest for its present-day peoples and the global environment as a whole. In addition to reading works about the Amazon River and its peoples, we will study the extraordinary collection of Amazonian archaeological and ethnological objects in Harvard’s Peabody Museum. Students will work with and research objects in the collections and write a series of short papers relating objects in the museum to the concepts, practices and beliefs encountered in the readings, seminar discussions, and films.
THE AMERICAN DEATH PENALTY: MORALITY, LAW AND POLITICS
Carol S. Steiker (Harvard Law School)

Freshman Seminar 41E 4 credits (fall term) Enrollment: Limited to 14

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 interpretations 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 1960-2020
Maxine Isaacs (Department of Government)

Freshman Seminar 41P 4 credits (fall term) Enrollment: Limited to 16

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 2020, and, together, members of the seminar will develop some perspective on dramatic changes as well as enduring factors that have shaped our own times, issues and society. With the help of some guests—practitioners including political leaders, public opinion analysts and journalists—students will develop a deeper understanding of contemporary politics; the impact of demographic patterns and changes; public opinion and polling; and political communication. Students will learn about the relationship among politics, news and public opinion, and who influences whom. Participants will be introduced to excellent contemporary studies about modern presidential campaigns and elections. At the end of the term, students will make oral reports to the class on lessons learned from a past election which can help all of us better understand this one.
AMERICANS AT WORK IN THE AGE OF ROBOTS AND ARTIFICIAL INTELLIGENCE
Benjamin M. Friedman (Department of Economics)

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

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

ANATOMY AND ETHICAL TRANSGRESSIONS IN NATIONAL SOCIALIST (NAZI) GERMANY
Sabine Hildebrandt (Harvard Medical School)

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

This seminar 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 biologistic 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 twenty-first 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 GREEK TRAGEDY FOR THE TWENTY-FIRST CENTURY
Naomi A. Weiss (Department of the Classics)

Freshman Seminar 63D 4 credits (fall term)  Enrollment: Limited to 12

Note: No prior knowledge of ancient Greek language or culture is required.

In Athens in the fifth century BCE, thousands would gather at the theater to see the latest plays of Aeschylus, Sophocles, Euripides, and their contemporaries. Their tragedies grappled with pressing questions of the day: What are the consequences of war? Why should we believe in god(s)? Should we obey the law or put our family first? What happens if a woman has power? How different are we from foreigners? 2500 years later, the handful of tragedies that survive continue to be performed and adapted across different media—in plays, novels, TV dramas, films, art installations, and advertisements. As when these plays were originally performed, they are frequently used to address urgent sociopolitical issues, from fascism to racism to women’s rights to immigration. In this seminar we will read and watch a selection of Greek tragedies alongside some of their most recent reincarnations, many of them created by women, people of color, and non-Western artists. We will think about how these ancient plays, largely produced by and for Athenian citizen men, resonate so powerfully with a remarkably diverse range of twenty-first century audiences. Topics for discussion will range from child sacrifice in Game of Thrones to the Oresteia reimagined in post-apartheid South Africa. For their final assignment students will produce their own tragic adaptations.

THE ART AND CRAFT OF ACTING
Remo F. Airaldi (Committee on Theater, Dance, and Media)

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

Note: The first class will be held on Labor Day Monday, Sept. 2nd. 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, minimize habitual behaviors and to develop characters. Students will explore a range of acting techniques designed to give students greater access to their creativity, imagination and emotional life. The aim will be to improve skills that are essential to the acting process, like concentration, focus, relaxation, observation, listening, etc. In the later part of the term students will work on monologues. Students will also attend and critique productions at the Loeb Drama Center and other theaters in the Boston area.
ASTEROIDS AND COMETS

Charles R. Alcock (Department of Astronomy)

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

Prerequisite: AP calculus or equivalent.

Comets have been seen regularly since before the beginning of recorded history. They have often been regarded as disturbing portents. Asteroids, on the other hand, were not discovered until the nineteenth century, with the advent of astronomy with telescopes. Today we know of many more asteroids than comets, but we believe that there are vastly more comets than asteroids in the solar system. This seminar will start with the history of the study of comets and asteroids, including the “Great March Comet of 1843”, observations of which led to the establishment of the Harvard College Observatory and its Great Refractor, at that time the largest telescope in the Americas. Our understanding of comets advanced dramatically in 1950 with the publication of two extraordinary papers: Whipple (then at Harvard) described the mixture of dust and ice that comprises the nuclei of comets, and Oort (Leiden University) showed that new comets enter the inner solar system from a vast, diffuse cloud surrounding the planetary system. 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.

BACK TO THE FUTURE: HOW THE PAST IMAGINED THE CITIES OF TOMORROW

Bruno M. Carvalho (Department of Romance Languages and Literatures)

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

Humans spend a lot of time thinking about the future. In this seminar we will discuss how urban futures were imagined in the past. And how things often turn out in very unexpected ways. European colonizers projected fantasies about the future onto the Americas, and in the past two centuries we have witnessed a boom in utopian and dystopian works about cities. We can think of much of modernity in terms of competing visions of what the future ought to be like. Besides flying vehicles, in the 1920s, for example, some vied for car-centric, highly segregated cities, others for mixed-race, multicultural communities. In modernity, we tend to assume that the future will be radically different from the past. But not all cultures have thought that way, and we will also consider alternative conceptions of time. As a set of expectations, the future helps to shape the present—even if it never quite arrives.
Today, with climate change and labor precarity setting in, it often seems as if a dreadful future is inevitable. Is our contemporary condition marked by innovation or exhaustion? From a catastrophist point of view, it is as if the future, not the past, is already fixed. In this seminar, we will investigate the urban visions of authors, designers and filmmakers, asking: how did unrealized projects impact the built environment? How can fiction and the arts stretch the limits of the thinkable? How might futures imagined in the past help us to address current urban and environmental challenges?

**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?

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

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

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

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

BORGES, GARCÍA MÁRQUEZ, BOLAÑO AND OTHER CLASSICS OF MODERN LATIN AMERICAN FICTION AND POETRY
Mariano Siskind (Department of Romance Languages and Literatures and of Comparative Literatures)

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

Note: All readings and discussion will be in English.

This seminar introduces students to some of the most important Latin American literary works produced during the twentieth century. We will explore the ways in which these novels, short-stories and poems interrogate the historical traumas, political contexts and aesthetic potential of the region between 1920s and 1980s. We will shed light on their place in the historical and cultural formation of the literary canon, as well as on the concept of ‘classic.’ The goal of this seminar is twofold. On the one hand, it introduces students to the Latin American literary and critical tradition through some of the best and most interesting literary and critical works (each novel or grouping of short stories and poems are paired with an important critical essay that situates them historically and aesthetically). On the other, it provides them with the fundamental skills of literary analysis (close reading, conceptual and historical framing, continuities and discontinuities with the aesthetic tradition). We read Jorge Luis Borges, Juan Rulfo, Gabriel García Márquez, Alejandra Pizarnik, Juan José Saer and Roberto Bolaño.
A BRIEF HISTORY OF SURGERY
Frederick H. 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 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 nineteenth 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 1930’s 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. The 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.

BROADWAY MUSICALS: HISTORY AND PERFORMANCE
Carol J. Oja (Department of Music)

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

Note: Student musicians and actors are welcome in the seminar, as are students who love to watch shows but not necessarily perform in them. Ability to read music is desirable but not required.

This seminar will explore a core group of Broadway musicals. Historical, musical, and theatrical discussions will be paired with student performances and staging of individual scenes (done under the guidance of Allegra Libonati from the A.R.T. Institute). The seminar will touch on signal moments over the course of the “Golden Age” of the musical, stretching up to the present day: Oklahoma! (1943), South Pacific (1949), West Side Story (1957), A Chorus Line (1975), Wicked (2003), and In the Heights (2008). The class will attend a performance of Stephen Sondheim’s A Little Night Music at Boston’s Huntington Theatre. Blending historical study and hands-on practice, this seminar aims to offer a wide range of perspectives on the interpretation and performance of Broadway musicals.
BUDDHIST ENLIGHTENMENT: VISIONS, WORDS AND PRACTICE  
Ryuichi Abe (Department of East Asian Languages and Civilizations)  

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

Note: There will be two required visits to the Harvard Art Museums related to the final student project.

How do you get enlightened? Is the Buddha a god or human? How many Buddhas are there in the world? How many celebrated enlightened women do we find in Buddhism? And why does Enlightenment matter? These are basic questions that even the most recondite books of Buddhism often fail to answer. This seminar looks at famous visual images of Buddhist enlightenment—not only iconographies of Buddhist divinities, but also architecture, gardens, ritual instruments, and maps of the world—and using them as our gateways, studies narratives, parables, metaphors, and theories that explain what enlightenment is, how to attain enlightenment, and how to retain it in one’s everyday life. The seminar encourages students to apply their understanding of Buddhist enlightenment as a way to better appreciate their own religious traditions and/or spiritual identities for the sake of enriching their inner selves as well as their social interactions.

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

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

Note: There will be a required class trip with no cost to the student, details to be announced.

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

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

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

CHALLENGING REALITY: LITERATURE AND SOCIAL JUSTICE
Nicole A. Suetterlin (Department of Germanic Languages and Literatures)

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

Note: This seminar will include a workshop with Boston Mobilization, a local, student-led, non-profit organization promoting social justice, movie nights for our films, and visits to the Harvard Art Museums and the Houghton Library.

What do vampires, zombies, ghosts, and cyborgs tell us about ourselves and our society? In this seminar we explore how literature critiques social injustices by challenging our notions of reality. Of particular interest to us are texts, films, and visual artworks that push beyond the confines of societal norms through their use of uncanny figures. From the man-made monster breaking loose in Mary Shelley’s Gothic classic Frankenstein, to the ghost of a traumatic past haunting Toni Morrison’s Beloved—how do these fantastical figures question the way in which we interact with others, and how others interact with us? Who is the monster in these scenarios: a part-human cyborg like Frankenstein’s “creature,” or the humans who exclude him from society because of his otherness? Chasing various “monsters” from the eighteenth to the twenty-first century, all the way to the popular TV series The Walking Dead, we explore how their stories challenge the social realities of their time and ours. Texts by influential American, British, French, and German authors invite us to understand the perspective of those whom society excludes because they voice dissent and envision a different, just reality. Our readings include the autobiography of Bryan Stevenson, a Harvard Law School graduate and civil rights lawyer who has been fighting a living “ghost” of slavery for the past three decades: racial bias in the U.S. criminal justice system. Topics include: racial justice, economic justice, migration, women’s rights, cultural trauma.
CHILD HEALTH IN AMERICA
Judith S. Palfrey (Harvard Medical School and Harvard T. H. Chan School of Public Health) and Sean Palfrey

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

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

THE CHINESE LANGUAGE, PRESENT AND PAST
C.-T. James Huang (Department of Linguistics)

Freshman Seminar 33R 4 credits (spring term) Enrollment: Limited to 12

Prerequisite: Some experience of the Chinese language is required as a prerequisite for taking the seminar (e.g., a minimum of one semester of prior formal instruction, or as a heritage speaker of Mandarin or any Chinese dialect). To fully satisfy this seminar, you must (a) complete each reading assignment and have questions ready before class, (b) actively engage in class discussion. In addition, students will complete a term project (individual or collaborative) on a topic in consultation with the instructor.

This seminar offers an opportunity to learn about the Chinese language, by observing and analyzing its linguistic structure, history, cultural tradition and social relevance. With a partially hands-on approach, we shall look at the fundamental principles that make up the sound system and govern the grammar of Mandarin, with particular attention to those features that distinguish Chinese from English and other languages, including its system of tones, its writing system, its word-order and syntactic patterns, and how the language has developed in over 2000 years of its recorded history. Looking deeper, we see how the study of Chinese may contribute to our understanding of language as a central component of human cognition. The seminar is designed for students with some experience of the Chinese language (e.g., with some prior formal instruction or as heritage speakers of Mandarin or any other Chinese dialect). The analytical skills acquired will be of use as an aid to improve on one’s proficiency, or in preparing for study in linguistics, translation, East Asian study, and/or artificial intelligence.
CHRISTIANITY AND SLAVERY IN AMERICA, 1619-1865
Catherine A. Brekus (Harvard Divinity School)

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

**Note:** In addition to our regular class meetings, we will meet at the Schlesinger Library to look at rare books and manuscripts, and we will take a guided walking tour of Boston’s Black Heritage Trail. The tour will include an exploration of the African Meeting House.

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 seminar will explore the relationship between Christianity and slavery in America from 1619, when the first slaves arrived in Virginia, to the Emancipation Proclamation in 1865. We will ask several questions. 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. In addition to discussing the readings during class meetings, we will listen to spirituals and analyze paintings, photos, architecture, and other objects (for example, abolitionist tokens).

CLASH OF TITANS, SEATS OF EMPIRE: THE AZTECS, TOLTECS AND RACE OF GIANTS IN ANCIENT MEXICO
William L. Fash (Department of Anthropology)

| Freshman Seminar 44J | 4 credits (fall term) | Enrollment: Limited to 15 |

**Prerequisite:** No background or previous experience, on or in Mexico is required, only an open mind.

The film “Clash of Titans” was a British extravaganza dedicated to exploring the ancient Greeks’ concepts of the interactions between humans and their gods. In Ancient Mexico, the tale of Topiltzin Quetzalcóatl, Toltec Prince of Tula, is the best-known example of the intervention of rival gods, in the affairs of kingdoms and empires, and serves as the point of departure for our seminar. Just as the Greeks countenanced sacrifices and political assassinations, in Ancient Mexico the three great empires practiced human sacrifice, regicide, and engaged heavily in warfare which was vital in their statecraft and economy. We will explore how these central components were explained and justified in their mythology, why reciprocity with the gods was so vital, and how and why each empire came to a violent end. We begin with the first-person description of the Aztec Empire and its violent conquest, penned by a foot soldier in Hernán Cortés’s army, Bernal Díaz del Castillo. In the following weeks we will explore the environmental basis, religious dimensions, and social and political development of civilization, cities, at the three seats of empire in ancient Mexico. We will make extensive use of Peabody Museum collections, archaeological studies, historical accounts, and recent films and other media to critically examine ancient practices and current perceptions of the Aztec empire (1428-1519 CE); its predecessor the legendary Toltec empire of Tula (850-1100 CE); and the foundational Teotihuacan empire (100-550 CE), known as “The City of the Gods” to people throughout the region. The Aztecs and Toltecs went to Teotihuacan on pilgrimage every 20 days, because the scale of that ancient city was so massive, the architecture so impressive, and the religious art and historical lore so compelling, that the Aztecs had a legend that it was built in an earlier creation, by a race of giants. Seminar participants will explore how the biases of the observer play a role in describing
and explaining “the Other.” Students will analyze the ways in which religion and the quest for power fueled the genesis, expansion and demise of all three empires. First-years in this seminar will also explore the ways in which the living descendants of the Aztecs are reviving their traditional culture and how the Pre-Columbian civilizations are integral to the national identity of Mexico and Chicanos in this country, vs. the way they are portrayed in Hollywood and U.S. popular culture, through films and other media in the U.S. and Mexico.

**CLIMATE CHANGE ECONOMICS: ANALYSIS AND DECISIONS**

**Martin L. Weitzman (Department of Economics)**  
**CANCELLED**

**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. This seminar relies on modern economic theory to focus on how an economist frames and views the basic issues. A small sample of questions to be asked and answers attempted in this seminar includes the following. How do we analyze and decide what to “do” about climate change? What are the basic “models” combining economics with climate science, what are these models telling us, and how do we choose among their varying messages? How are risk and uncertainty incorporated? How do we estimate future costs of carbon-light technologies? How do we quantify damages, including ecosystem damages? Who pays for what? Why are discounting and the choice of discount rate so critical to the analysis and what discount rate should we use? What is the “social cost of carbon” and how is it used? Which instruments (prices, quantities, standards, etc.) are available to control greenhouse gas emissions and what are the strengths and weaknesses of each? What is “climate sensitivity” and why is it, and the feedbacks it incorporates, so important? How should the possibility of catastrophic climate change be evaluated and incorporated? What are 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?

*The class was a great introduction to academics at Harvard. I really enjoyed [...] the way class discussions reached beyond the text. There was often an emphasis on connecting the ideas to our own lives, which made the seminar very different from other courses here. [...]*
**COMICS AND GRAPHIC NOVELS**  
Stephanie 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. That 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 comes with its 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 seminar 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 E. J. Witzel (Department of South Asian Studies)

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

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

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

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

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

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: The seminar will require knowledge of one language besides English. There will be at least one required field trip, to the Isabella Stewart Gardner Museum.

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, film, 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 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. The only requirement is some knowledge of a language besides English—and a readiness to play with languages, art forms, and texts. Readings from Anna Akhmatova, Walter Benjamin, Jorge Luis Borges, Joseph Brodsky, Anne Carson, Emily Dickinson, Forrest Gander, Susan Howe, Velimir Khlebnikov, Vladimir Nabokov, Sappho, W. G. Sebald, Wang Wei, and Sor Juana; music by John Adams and David Grubbs. Films to include Despair, Chekhovian Motifs and The Golem.
CRIME AND PUNISHMENT
Robert J. Sampson (Department of Sociology)

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

What (if anything) motivates some individuals to commit acts of crime and not others? Why is violence highly concentrated in a small number of families and communities? Why did crime plummet in the United States in the last few decades while incarceration rose? Such questions have no easy answers. Indeed, crime has long puzzled social thinkers across many disciplines. This freshman seminar takes on the puzzle of crime by exploring fundamental debates on its definition, nature, explanation, and control. The emphasis will be the discussion of original readings, both classical and contemporary, and the critical appraisal of major theoretical explanations. We will begin with controversies over the very definition of crime, after which we will explore key facts about crime, assumptions that different theories make about human nature, and competing explanations about the causes and control of crime. Finally, armed with this knowledge, the class will debate and write about two case studies—the crime drop and mass incarceration in America.

CRISPR, GENOME EDITING AND THE FUTURE OF MEDICINE
David R. Liu (Department of Chemistry and Chemical Biology)

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

Prerequisite: High school chemistry and biology knowledge.

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

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

Freshman Seminar 71T  4 credits (fall term)  Enrollment: Limited to 15

Note: There will be a required field trip to the Charles River Museum of Industry, Waltham, MA. Transportation will be provided at no cost to the student.

In all likelihood, at least a dozen—probably many times more—of the items on and around you right now were manufactured in a factory. Our modern lives are inextricably linked to the assembly line. This has not always been the case. Only in the late eighteenth and early nineteenth centuries did factories become the primary sites of production in industrializing countries, churning out, through the toil of laborers and the working of machines, an ever-widening assortment of goods. To its proponents, the factory was a marvel of material achievement, placing within the reach of those with sufficient means a cornucopia of commodities. To its detractors, it was a manifestation of the exploitation of man and nature—the title of our seminar, “Dark Satanic Mills,” is one famous characterization of the factory by the poet William Blake. A large part of the attraction to and repulsion of the factory has been, after all, its involvement not only in the making of wares within its walls but also in the fashioning of worlds beyond. How did the factory as an institution emerge and evolve over time? How has the development of the factory intersected with broader transformations in technology, society, and the environment? In this seminar, we will grapple with these still-present questions by exploring the history of the modern factory from its origins in industrial revolution England to its current instantiation in contemporary China.

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

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

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

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

Standards of living vary greatly across countries, they rise fast in some and slowly in others. Economic growth has historically been related to the expansion of international commerce as well as industrialization and institutional reforms. How does a country’s well-being and growth depend on its trade partners? Is globalization in the form of international integration desirable? Do all income classes benefit from globalization? What role do trade policies play in shaping the benefits and costs of globalization? We will discuss the historical evidence on economic growth, the expansion of commerce, and the evolution of trade policies. We will also discuss the nature of these processes and the interdependence between them. Using this knowledge, we shall discuss the pros and cons of globalization and the tradeoffs faced by policy makers. These tradeoffs will be illustrated with contemporary policy debates concerning tariffs and free trade agreements. Finally, we will discuss the impact of globalization on inequality within countries and in the world economy.

ECONOMIC DEVELOPMENT
Michael R. Kremer (Department of Economics)

Freshman Seminar 41J 4 credits (spring 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 Harvard's Economics 10a.

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 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 political science and sociology. The seminar will start with readings of Adam Smith, Karl Marx, and Max Weber. Participants will then read 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 and more microeconomic approaches.

My relationship with a faculty member which began in a freshman seminar, continued in an independent study, and concluded in her supervising my thesis.
THE ECONOMIST’S VIEW OF THE WORLD
N. Gregory Mankiw (Department of Economics)

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

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

This seminar’s goal is to probe how economists of various perspectives view human behavior and the proper role of government in society. Each week, seminar participants will read a brief, nontechnical, policy-oriented book by a prominent economist. The participants will then discuss the work’s strengths and weaknesses, exploring the positive scientific judgments and normative value systems that underlie each author’s policy prescriptions. Each week, as preparation for the class meeting, each seminar participant is expected to send the instructor a brief email describing his or her views of the week’s reading. In addition, each participant will have the opportunity to write his or her own essay addressing an economic policy issue. The essay will be read and discussed by all seminar participants.

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

Note: In addition to traditional class sessions, the seminar will incorporate field trips to the Harvard Innovation Lab and startup companies.

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 eighteenth 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.
**ETHICS FOR A BROKEN WORLD**  
Edward J. Hall (Department of Philosophy)

Freshman Seminar 63H  
4 credits (fall term)  
Enrollment: Limited to 12

This seminar borrows its title from philosopher Tim Mulgan’s book of the same name. Mulgan imagines how basic questions about ethics and political justice might look to our descendants in one all-too-possible world: a “broken” world in which critical natural systems can no longer be depended on for basic goods, where disaster strikes unpredictably and peace cannot be guaranteed. The book takes the form of a series of philosophy lectures, drawn from a seminar taught some time in the future, looking back on our own time as an “age of affluence” whose basic moral and political outlooks were shaped by expectations of material security that can no longer be maintained. This is a stark, emotionally daunting, and powerful framing device. By working through the book in detail, we will aim to come to an uncompromisingly clear-eyed view of the central ethical and political issues that are rapidly confronting us as the ecological crisis unfolds. It is too late to avert the crisis: Like it or not, profound changes in lifestyle will be forced on all of us, if we do not wish to leave the world so broken as to be uninhabitable. How can these changes be managed in as just a fashion as possible? How can we build the resilience into our social and political institutions needed to weather the coming storms as humanely as possible? What basic stances towards ethics and politics will we have to rethink? These are some of the questions we will attempt to answer.

**EUCLID’S ELEMENTS: THE CLASSICAL LEGACY THAT JUST KEEPS GETTING BETTER**  
Paul G. Bamberg (Department of Mathematics) and Mark J. Schiefsky (Department of the Classics)

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

Note: While the seminar is a mathematics class, not a language class, we will investigate the grammar and structure of ancient Greek and translate a few key definitions, postulates, and theorems. Students will have the option of pursuing additional topics in mathematics, in the Greek language, or in the geography of the large portion of the ancient world in which Greek was the common language of the educated.

Visit Athens: the Parthenon still stands, but its decorations are gone. Visit Rome: you can tour the Colosseum, but it is not in good enough condition to host a modern sporting event. Visit the Internet, though, and you can find Euclid’s Στοιχεία (Elements), the greatest mathematics textbook ever written, in an electronic form that surpasses any ancient manuscript. You can view the Greek text and its English translation side by side and learn the origin of words like “rhombus” (ῥὸμβος) and “isosceles” (ἰσοσκελής) that you have probably seen only in your geometry class. Better yet, you can click on the word ὑποτεινόσης (hypotenuse) and instantly learn that it is the feminine genitive singular form of the present active participle formed from the verb ὑποτείνω (“subtend”). Had you been a member of the Harvard class of 1724, in the era when all Harvard students, according to the University archives, “followed a prescribed course of studies in Latin, Greek and Hebrew” and pursued disciplines that “included Rhetoric and Logic, Ethics and Politics, Arithmetic and Geometry,” you would spend a great deal of time learning how to do this sort of pars-
ing. This seminar explores the most famous theorems in the *Elements*, with special attention to ones that have arguably improved over the ages, since they have turned out to be valid not only in Euclidean geometry but also in non-Euclidean geometries like the spherical geometry of the Earth's surface, the hyperbolic geometry that provides an alternative to Euclid's postulate about the uniqueness of parallel lines, and the Minkowskian geometry that helped to inspire Einstein's theory of relativity.

**EQUATION, BUDDHISM AND ETHICS**  
John R. Wakeley (Department of Organismic and Evolutionary Biology)

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

Evolutionary genetics traces back to Darwin's (1859) idea of natural selection. Darwin provided a compelling theory about how species change due to competition in reproducing populations, yet it remains difficult to understand, particularly when applied to ourselves. To enable critical evaluation and discussion of ethical questions and to illustrate connections between science and Buddhism, about one third of this seminar will cover select details of evolutionary genetics. The focus will be on understanding human genetic variation. Buddhism originated with Siddhattha Gotama's enlightenment around 500 BCE, achieved after six years of intense devotion to the problem of human suffering. He emerged as the Buddha, or the Enlightened One, making the bold statement that suffering within each person results from misunderstanding the nature of one's self and its relationship to the ever-changing world. He outlined a program of analytical introspection and meditation, aimed at solving this problem. As with evolutionary genetics, critical evaluation and discussion of Buddhist ideas in this seminar will be fostered by learning the details of what the Buddha taught. Major points of overlap between evolutionary genetics and Buddhism emerge in the ways they undermine appearances, deconstructing phenomena which at first appear wholly unbreakable. We will bring our knowledge of Buddhism to bear on ethical questions arising from genetic testing, the use of human embryos in research, and the prospects for human genetic engineering.

**EXPERIENCING POETRY: LOVE, WAR, NATURE AND RELIGION IN FOUR MAJOR TWENTIETH-CENTURY POETS**  
Neil L. Rudenstine (Department of English)

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

In our seminar, we will read four major twentieth-century poets—from some of their early work to their latest. The hope will be to see how each poet developed during the course of his or her career. How did their styles and their deepest concerns alter over the course of a lifetime? We will run the seminar as a lively discussion group, and will read the poems in some detail, trying to understand their tones, structures, and cadences—reading them aloud as well as silently. In the work of W.B. Yeats, we will see major changes in his conception of love, as well as his views of Irish nationalism and the Irish revolution. Meanwhile, in T.S. Eliot, we find a narrator whose essential quest is spiritual, beginning with Prufrock and then The Wasteland (to which we will devote two weeks). Elizabeth Bishop introduces a highly original voice that expresses personal emotions obliquely and, in effect, “objectively” through understated descriptions of events and places. Finally, W.H. Auden’s trajectory shows an early (1930s) portrayal of human nature and society that is in certain respects similar to Eliot’s but that ends very differently, suggesting values and ways of life that are much less foreboding.
In the seminar’s first week, we will read and analyze a small group of lyrics by a few writers (none of whom will be identified by name or exact time period). This will be an exercise in “close reading” intended to help us judge poetic quality, because some of the lyrics will be excellent—and some quite dismal! The week is meant to be enjoyable, and our discussion should be fun and perhaps hilarious. There will be four essays due—one on each poet—during the course of the term, about 7–8 pages each.

**EXPLORING THE INFINITE**
Peter Koellner (Department 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 focus on the mathematical infinite. We will start with the so-called “paradoxes of the infinite,” paradoxes that have led some to the conclusion that the concept of infinity is incoherent. We will see, however, that what these paradoxes ultimately show is that the infinite is just quite different than the finite and that by being very careful we can sharpen the concept of infinity so that these paradoxes are transformed into surprising discoveries. We will follow the historical development, starting with the work of Cantor at the end of the nineteenth century, and proceeding up to the present. The study of the infinite has blossomed into a beautiful branch of mathematics. We will get a glimpse of this subject, and the many levels of infinity, and we will see that the infinite is even more magnificent than one might ever have imagined.

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

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

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

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

In 1995, the Fiji Islands were one of the last places on the planet to receive broadcast television. Within just three years, body weight ideals had transformed from large to thin and purging had become as common in Fijian high school girls as in their Massachusetts counterparts. How can we understand what happened in Fiji? And, likewise, how did heaviness in the U.S. migrate from signifying prestige to stigmatizing? In this seminar, we will examine the bio-social dimensions of disordered eating and being overweight as well as the volatility of weight ideals and their enduring moral salience. We will draw from anthropological and clinical perspectives to explore the rapidly shifting landscape of body shape ideals in the U.S. over the last century, the arrival of eating disorders in the Global South, the medicalization of obesity, and the emergence of pervasive weight stigma—as manifest in ‘fat shaming’ and even in policy interventions that have had unintended consequences. We will ask what the social structural determinants of obesity are, as well as how social adversities relating to the built environment, toxic food environment, climate change, and food deserts are embodied. We will examine variation in how the body is cultivated for self-presentation across diverse cultural contexts alongside evidence that the media have accelerated the globalization of thin ideals. We will conclude by considering both emerging threats inherent to pervasive social media platforms and digital photo-shopping as well as potential opportunities to reset social norms through social movements and policy.

FAULKNER, ELLISON, MORRISON
Jesse McCarthy (Department of English and of African and African American Studies)

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

Note: This is an intensive reading seminar and interested students should be willing to commit to a heavy weekly reading load.

The “Great American Novel” is infamously a difficult notion to harpoon and reel in, but any list of great American novelists will undoubtedly contain the names of William Faulkner, Ralph Ellison, and Toni Morrison. Together we will read some of the most celebrated and powerful works of fiction produced during what Henry Luce called “The American Century.” We will ponder the significance of these literary giants in relation to U.S. and global history, the role of the novelist as a voice of conscience, and the place and prestige of fiction as a site for grappling with history and morality, as well as the impact of modernism and postmodernism on novelistic form. We will explore the treatment of race, class, gender, and regionalism, and how these writers weave the fissures of our social fabric into texts that attempt to reconstitute and restore marginal perspectives, sustaining narratives that encompass this vast complexity while also discovering within themselves moments of aesthetic bliss. Many of the novels we will read are long and challenging; they are also some of the most essential and lasting testaments to the genius of literary art in the last century.
FRESHMAN SEMINAR PROGRAM

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.

THE FIRST AMERICANS: PORTRAITS OF INDIGENOUS POWER AND DIPLOMACY
Shawon K. Kinew (Department of History of Art and Architecture)

Freshman Seminar 63I  4 credits (fall term)  Enrollment: Limited to 12

Harvard’s Peabody Museum of Archaeology and Ethnology is home to 25 oil portraits of indigenous American leaders painted in the first half of the nineteenth century. Originally commissioned to preserve cultures an American bureaucrat feared would be extinct, these paintings transcend a moribund history. In fact, the Native American nations represented are still here. Moreover, these portraits have much to teach us about diplomacy, power, representation and indigeneity in 2019. The Peabody portraits, painted by the American artist Henry Inman, represent some of the most fascinating political leaders of the American nineteenth century—chiefs, spiritual leaders and diplomats, who all traveled to Washington, D.C. to negotiate with the U.S. government on behalf of their tribal nations. Through the close examination of these artworks in person at the Peabody, this seminar will focus on the stories, histories and teachings communicated by these portraits and their sitters.
**FIRST STARS AND LIFE IN THE COSMOS**  
Abraham Loeb (Department of Astronomy)  

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

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

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

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

*Note:* The class will engage in hands-on sessions in the kitchen. No previous knowledge of 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 this reflects identity and culture of these lands.

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 Quijote’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 century, and those of the many closer, traumatic events of the twentieth 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 ten centuries. The films and videos are more recent, and will have subtitles.
FOOD, UP CLOSE AND PERSONAL
Noreen Tuross (Department of Human Evolutionary Biology)

Freshman Seminar 50P  4 credits (fall term)  Enrollment: Limited to 10

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 J. Ungar (Department of Government)

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

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

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

Prerequisites: The seminar will include scientific concepts and their empirical and theoretical foundations, but no scientific preparation beyond high school physics is required.

It is easy to find controversies at the intersection of science and religion, from the time of Galileo, to Darwin and the emergence of modern cosmology. Yet many scientists throughout the ages have been devoutly religious, challenging claims of an intrinsic enmity between science and religion. This seminar treats a number of historical conflicts between religious beliefs and scientific theories, among them the Galileo affair, the clockwork universe, evolution, and the Big Bang theory. The seminar will introduce students to the main protagonists through their own words, and through contemporary and modern-day commentaries. We will explore why these conflicts arose and, based on these historical lessons, what we can expect the future relationship between science and religion to be. The ultimate aim of this seminar is for students to form their own opinion of which kind of conflicts between science and religion are inevitable and which are accidents of time and place, and under which conditions, if any, interactions between science and religion can be mutually beneficial. Most of the seminar will focus on Christianity and the natural sciences, with emphasis on astronomy and cosmology, but the relationship between other ancient and contemporary religions and other sciences will be discussed as well to provide a broader context.

FROM ROCKET SCIENCE TO FIXING SCANDALS: JUDGMENT AND UNCERTAINTY IN FINANCE
Stephen J. Blyth (Department of Statistics)

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

Prerequisites: Students should be prepared to develop rigorous, logical reasoning and be comfortable with elementary quantitative arguments. However, no specific mathematical skills are required, and the seminar is particularly designed for students who do not expect necessarily to take quantitative economics or finance classes but are interested in—or mad about—what happens on Wall Street.

Why do so many of your peers pursue a career in finance—other than for the money? What are the intellectual rewards of the profession which attract some of the sharpest minds of your generation? In this seminar, we explore key concepts underlying the financial system, including market-making, replication and arbitrage, and demonstrate how these ideas enable us to make powerful statements about uncertainty in finance. The logical arguments which follow catalyze the construction of the rigorous discipline of financial engineering—powered by quantitative analysts or “rocket scientists.” We illustrate these concepts with a series of case studies, in particular discussing how rational arguments broke down during the 2007-2008 financial crisis, when many tenets of quantitative finance were violated. We also examine the merits of the subsequent regulatory interventions. We discuss several “classic trades of all time” which illustrate the power of financial reasoning and subtlety of judgment required to navigate the financial system. Further, we investigate abusive financial practices such as collusion, front-running and market manipulation, notably in the foreign exchange and “libor” fixing scandals, and discuss the boundary between healthy functioning markets and malpractice.
**GENERATING BIODIVERSITY: HANDS-ON RESEARCH EXPERIENCE IN SPECIATION BIOLOGY**
Robin Hopkins (Department of Organismic and Evolutionary Biology)

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

*Note:* The goal of this seminar is to provide an authentic research experience to students fascinated by biological diversity. Most classes will be held at The Arnold Arboretum of Harvard University.

What is a species and how do they evolve? How do we, as scientists, study the process of speciation and the generation of biodiversity? This is a research experience seminar in which you, as a student, will study how and why species evolve. For decades scientists have been arguing over the definition of “species.” Why does the definition matter? Genetic diversity across genomes has revealed that many species hybridize and exchange genetic material (even humans). How and why does this happen? It has long been assumed that hybridization is bad for an individual or species. But, can hybridization also be good by generating biological diversity? We will discuss these ideas while performing research experiments on plants in the state-of-the-art research labs at the Harvard University Arnold Arboretum. The experiments will involve trying to generate hybrid seeds; quantifying the health of hybrid individuals; and using microscopy to determine the success or failure of hybrid pollen to germinate and grow inside a flower. Students will collect their own data, learn how to analyze it, and present their findings. In the process, we will explore fundamental concepts in evolution and biodiversity.

**GNOSTICISM AND FILM**
Charles M. Stang (Harvard Divinity School)

Freshman Seminar 63F 4 credits (fall term) Enrollment: Limited to 12

Are you anxious about political surveillance and domination, the dangers of technological innovation (especially artificial intelligence), the possibility of alien life and its intentions, and the threat of environmental devastation, and other apocalyptic futures? You’re not alone: contemporary filmmakers are constantly exploring these themes. What may surprise you, however, is that these filmmakers are increasingly turning to an ancient spirituality, sometimes called “Gnosticism,” as a resource for thinking through these anxieties. “Gnosticism” is a spirituality that existed at the margins of several religions of antiquity, including Christianity. While there is no single set of Gnostic beliefs, it is characterized by a distinctive mythology in which the world we inhabit is believed to have been created by a malevolent or ignorant god, and governed by its deputies. Gnosticism emerges, then, as a critique of the created order and the powers that be, and imagines forms of resistance and liberation, including how to seek out the true god, who is higher than the creator and its deputies. This distinctive spirituality and mythology come down to us through ancient texts, some of which have only recently been discovered, and their modern interpreters. This seminar examines Gnosticism’s sudden resurgence in the world of film (and increasingly, in television), especially in science fiction and fantasy. From *Bladerunner* to *Westworld*, from *The Matrix* to the *Alien* franchise, we see more and more films picking up this ancient mythology and playing with it. The aim of this seminar is to equip students with the texts and tools to see this ancient spirituality at work in our contemporary culture.
HABITS, RITUALS AND LIVING THE GOOD LIFE
Michael I. Norton (Harvard Business School)

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

Everyone wants better habits—for themselves, their housemates, their partners, their children, their employees, their customers—but how are habits first inculcated, and then perpetuated? And can carrying out these habits feel like anything other than drudgery? This class will explore the interplay between habits and rituals—those odd, seemingly meaningless behaviors that research shows influence our psychology in profound ways, making the mundane meaningful: dull morning routines can instead get us “ready for our day” and rote work meetings can instead improve team cohesion and performance. We will explore rituals in domains ranging from performance anxiety to team effectiveness, from enhancing consumption to improving health—in our daily lives, our work lives, and even our lives when trying to cope with family during the holidays.

THE HEART OF MEDICINE: PATIENTS AND PHYSICIANS AND THE EXPERIENCE OF SERIOUS ILLNESS
Susan D. Block (Harvard Medical School)

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

Note: There will be a required trip to Mt. Auburn Cemetery.

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

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 freshman seminar explores the underlying legal framework in which human rights advocates operate, and then uses specific case studies to consider the various challenges they must grapple with in their work. The seminar is designed to encourage students to critically evaluate the human rights movement while offering an introduction to some of the essential tools and strategies used by human rights advocates, including advocacy, litigation, documentation, and report writing. Students will be asked to grapple with tough questions, such as: How can human rights be harnessed to successfully influence and change behavior? What does responsible, effective human rights advocacy look like? How do we engage without perpetuating power differentials along geopolitical, class, race, gender, and other lines? How do we find ways to work in collaboration with directly affected communities? What does it mean to be a human rights advocate working on abuses affecting individuals and communities remote from yourself? How do you balance broader advocacy goals with the needs of individual survivors or clients? How do you determine when to intervene and devote limited resources to a given issue? Students will also consider a series of dynamics (e.g., north/south, insider/outside, donor/donee, lawyer/non-lawyer) that influence how and why advocacy is formulated and received. Finally, the seminar considers the limits of the human rights paradigm and established methodologies, such as litigation and “naming and shaming,” and explores alternative sources and forms of advocacy, including the role of community lawyering in the human rights context.
IN PURSUIT OF THE ORDINARY: GENRE PAINTING IN BOSTON-AREA MUSEUMS
Joseph L. Koerner (Department of History of Art and Architecture)

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

Note: The seminar will conduct its meetings on site at various local museums, including the Harvard Art Museums, Boston’s Museum of Fine Arts, the Isabella Stewart Gardner Museum, the ICA, and Harvard’s Peabody Museum of Archaeology and Ethnography.

This seminar looks at portrayals of everyday life in art, mostly from Europe and America, and mostly in the medium of painting. Examining original art objects in different Boston-area collections, we investigate this type of imagery as it develops into a distinct tradition. We observe its beginnings in medieval marginalia. We trace its evolution into a specialty product from the Renaissance and through its heyday in the seventeenth and eighteenth centuries, when it came to be called “genre painting.” And we consider its rejection by and strange survivals in modern art. Studying individual artworks closely, we also explore the character and missions of the public collections that house them.

INSIGHTS FROM NARRATIVES OF ILLNESS
Jerome E. Groopman (Harvard Medical School)

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

A physician occupies a unique perch, regularly witnessing life’s great mysteries: the miracle of birth, the perplexing moment of death, and the struggle to find meaning in suffering. It is no wonder that narratives of illness have been of interest to both physician and non-physician writers. This seminar will examine and interrogate both literary and journalistic dimensions of medical writing. The investigation will be chronological, beginning with “classic” narratives by Tolstoy, Chekhov, and Kafka, and then moving on to more contemporary authors such as William Carlos Williams, Richard Selzer, Oliver Sacks, Susan Sontag, and Philip Roth. Controversial and contentious subjects are sought in these writings: the imbalance of power between physician and patient; how different religions frame the genesis and outcome of disease; the role of quackery, avarice, and ego in molding doctors’ behavior; whether character changes for better or worse when people face their mortality; what is normal and what is abnormal behavior based on culture, neuroscience, and individual versus group norms. The presentation of illness in journalism will be studied in selected readings from the New York Times’ and Boston Globe’s Science sections, as well as periodicals like the New Yorker, The New York Review of Books, Harper’s, and The Atlantic. The members of the seminar will analyze how the media accurately present the science of medicine or play to “pop culture.” The seminar will study not only mainstream medical journalists, but so called alternative medical writers such as Andrew Weil. 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.

**IRELAND RISING**

*Catherine McKenna (Department of Celtic Languages and Literatures)*

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<th>Freshman Seminar 60D</th>
<th>4 credits (fall term)</th>
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One hundred years ago, in 1919, a parliamentary assembly met in Dublin and declared that “We, the elected Representatives of the ancient Irish people in National Parliament assembled, do, in the name of the Irish nation, ratify the establishment of the Irish Republic and pledge ourselves and our people to make this declaration effective by every means at our command.” The members of this assembly, Dáil Éireann, had been elected to the Parliament of the United Kingdom of Great Britain and Ireland, but they refused to take their seats in that body, choosing instead to declare the independence of Ireland from Great Britain. On the very same day that Dáil Éireann met for the first time, members of the Irish Republican Army ambushed and killed two members of the Royal Irish Constabulary. These two events mark the beginning of a war of independence that would lead to the establishment of the Irish Free State in 1922 and the Republic of Ireland later on. This seminar focuses on the development of a sense of “Irishness” in the fifty years or so leading up to 1919—in politics, music, literature, the visual arts, athletics, and language. We’ll find our way back into the 1919 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 Houghton Library and 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. We will explore the range of cultural practices that defined Ireland as a people and a nation then, and consider how the integration of Ireland into the European Union and Brexit have reconfigured Ireland’s relationship with the United Kingdom.
ISLAM VS. IMAGE?: VISUAL REPRESENTATIONS IN ISLAMIC ART
David J. Roxburgh (Department of History of Art and Architecture)

Freshman Seminar 63J  4 credits (fall term)  Enrollment: Limited to 12

Note: Each weekly meeting is held in the Art Study Center of the Harvard Art Museums with selected works of art.

Is Islam against images? For reasons that are perplexing and hard to pinpoint, this notion appears to have been promoted by ideas about Islamic doctrine and an endemic hostility toward images which has only been magnified after recent years of religious extremism and terrorism. These include the Taliban’s destruction of the Bamiyan Buddhas in Afghanistan in 2001, and the Charlie Hebdo mass shooting in Paris 2015 over the cartoons representing the Prophet Muhammad. And yet there is ample evidence of making and using images across the time and space of Islam. The stereotype of Islam’s antipathy toward paintings and drawings, etc., has fostered the understanding that calligraphy and geometry flourished because of figuration’s illicitness. These ideas and assertions are misleading and incomplete. The Seminar is an opportunity for personal reflection and to study the issues at stake in questions about the values, forms, and functions of images and examines a broad variety of images produced throughout the Islamic lands from 600–1900. Each week focuses on a selected case study that together span diverse subject matters, mediums, functions, and contexts, and invite thought about a spectrum of modes of representation. We will learn that the condition of images in Islam is as diverse and complex as the religion itself which cannot be reduced to a unified or monolithic expression, to a singular system of belief.

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

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

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

**KNOWING CICERO**

_Jared M. Hudson (Department of the Classics)_

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<th>Freshman Seminar 62L</th>
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_Note: No prior knowledge of Cicero, Latin, or the ancient Roman world is assumed or required in order to take this seminar. The seminar will include a visit to Houghton Library to examine some of the library's rare manuscripts of Cicero's works._

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

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

It was discovered around 1800 that the major languages of Europe, along with the ancient languages of India and Iran, were descended from an unattested parent, formerly known as “Aryan” or “Indo-Germanic,” but today usually called Proto-Indo-European. The identification of the Indo-European family raised many questions, some purely linguistic (e.g., what was Proto-Indo-European like; was it grammatically complex or “primitive”?'), and some more far-reaching (e.g., who were the speakers of Proto-Indo-European; why did Indo-European languages spread so widely?). Questions of the first type eventually led to the birth of the new academic field of linguistics. Questions of the second type, however, misled some nineteenth- and early twentieth-century intellectuals to posit a genetically and culturally superior Aryan “race.” Although this idea is now universally rejected, linguistic evidence still plays an important role in studies of the past. Recent debates about the origins of “Western civilization,” for example, center on the alleged presence of borrowed Egyptian words in Greek, while theories about the settlement of the Americas depend on supposed linguistic connections between the New World and other continents. This seminar will explore the use and misuse of such methods. What, if anything, does the fact that languages are related tell us about their speakers? How can we distinguish genuine cases of linguistic borrowing or “influence” from the kinds of resemblances that come about through pure chance? Answers to these and similar questions will be sought through case studies, with readings chosen to illustrate and contrast scholarly and un scholar- ly approaches. The work for the seminar will consist of readings, four or five short problem sets, and a final project with both written and oral components.

LAW AND SOCIETY THROUGH THE CINEMATIC FRAME
Ofrit Liviatan (Department of Government)

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

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

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

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

LGBT LIFE STORIES
Linda Schlossberg (Committee on Degrees in Studies of Women, Gender, and Sexuality)

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

In this seminar we’ll read a range of classic LGBT life stories (memoirs, journals, diaries, essays, and autobiographies), beginning in the 1800s and ending in the present. We will study them as products of their specific historical moment, paying close attention to changing ideas about race, class, gender, and sexuality. Questions: How do people narrate the story of their identity? What aspects of their life histories do they highlight; what do they censor? How does the “coming out story,” generally understood to be characterized by truth-telling and revelation, borrow from the conventions of fiction?

The instructors were passionate about the topic and so were all of the students. This common interest created an environment where learning was both enjoyable and impactful [...and] nurtured conversation because students felt more comfortable/eager to participate.
MAGIC AND OTHER VIRTUAL REALITIES
Shigehisa Kuriyama (Department of East Asian Languages and Civilizations)

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

This seminar explores our remarkable propensity, as human beings, to respond viscerally to simulacra of realities as if they were real—even though we know, intellectually, that they aren’t. Think of how movies make us laugh and cry, even though we know that they are just fleeting images on a screen. Think of how colored pills can dissolve our pains, even after we learn that they are not “real” medicines, but mere placebos. And think of the hypnotic spell cast by certain clumps of metal and strips of paper, just because we imagine them as “money.” What makes virtual realities so powerful? And what does their enormous sway reveal about our hearts and minds? The seminar will open by dissecting how magicians craft convincing illusions, and then go on to study virtuality in comics, religious rituals, economics, movies, and medicine—as well as, of course, in computer-generated VR. The class will involve regular hands-on activities: in addition to reading theories of how virtual realities work, we will also experiment with practical applications, including the design of astounding magic tricks, and the use of sound to shape what the eyes see.

MAKING PLACES AND SPACES IN MODERN AMERICA
Lizabeth Cohen (Department of History)

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

Note: There will be a mandatory field trip late in the term, date to be decided.

How did a home in 1945 compare to one in 2000? Did the opening of shopping malls in the 1950s change people’s consumer habits? What made living in suburbs similar to and dissimilar from cities? How did various work and leisure settings alter people’s attitudes toward labor and play? In what ways was traveling by airplane from airports different from transit by train? The built and natural environments offer important clues to how American culture, politics, and social life have transformed since World War II. In this seminar we will examine closely the shifting character of the ordinary and extraordinary places and spaces of postwar America. We will explore typical environments like the church, school, factory, movie theater, bar, and office as well as more unusual sites like a prison or Disneyland. In every place they occupied, Americans have left an important record of their values, tastes, and priorities. In the diversity of their choices we can see both what unites Americans in a common culture and what keeps them apart, segregated in different physical—as well as social and political—worlds, often defined by race, class, and gender. In addition to our group investigations through readings, media, and discussion, students will undertake their own exploration of a place or space that has changed significantly over time. And together we will visit several revealing locations in the Greater Boston area to analyze what the physical world can teach us about the United States since 1945.
MAKING THE GRADE? MIDDLE AND HIGH SCHOOL MATH EDUCATION IN THE U.S.
Robin Gottlieb (Department of Mathematics)

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

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

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

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

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

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

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

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

MIGRANTS IN FICTION AND FILM: CASE STUDIES OF LOVE, LOSS, WAR AND DEATH  
SEMINAR CANCELLED
Françoise Lionnet (Department of Romance Languages and Literatures and of African and African American Studies and Committee on Degrees in Studies of Women, Gender, and Sexuality)

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

Note: All readings are in English translations and all films are subtitled.

What is “migrant” identity? How does traversing geographic, regional, cultural, linguistic, sexual or social boundaries transform us? What borders did you have to cross to be here? In our era of large-scale migrations from the global south (Africa, Asia, Latin America) to the global north (Europe, North America), such questions are becoming ever more pressing, and multilingual writers are providing thought-provoking answers. This is particularly true in the case of French-speaking artists. Although French (like English, Spanish or Portuguese) first spread as a colonial language, it was appropriated and transformed by those who speak it outside Europe. As a result, there are 274 million French-speakers in the world today, but only 66 million of them live in France. As the language migrated, so did concepts of universal rights that can reinforce both nationalist resistance to colonial power and local critiques of native traditions. The spread of Western languages and values has been a fraught process with far-reaching social, moral and aesthetic consequences. In this seminar, we examine the translated works of writers and filmmakers who have found success in a medium that redraws the map of what constitutes literature and film in French today. We study writers who speak to us of deeply felt identity issues, whether we have ancestral roots elsewhere or descend from displaced native populations. Their efforts resonate with our longing to understand our present reality, to get more insights into the world’s current transformations, and to imagine a better future. These artists will invite you to discover through personal accounts as well as fictional narratives a global culture that is as creative as it is diverse and whose protagonists wrestle with the urgent aesthetic, religious, environmental, and political issues of our shared planet.
**MORALITY, LEADERSHIP AND GRAY-AREA DECISIONS**  
*Joseph L. Badaracco (Harvard Business School)*

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

**MUSEUMS**  
*James Hanken (Department of Organismic and Evolutionary Biology)*

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<th>4 credits (fall term)</th>
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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.
MUSIC FROM EARTH
Alexander Rehding (Department of Music)

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

Note: Ability to read music is not required. The seminar includes visits to several of Harvard’s unique facilities. An interest in bold and creative ideas is welcome.

In 1977 NASA shot a mixtape into outer space. The “Golden Record,” as it is known, is aboard the Voyager spacecraft, which is now outside the solar system on its way into the unknown. It contains a selection of music from all over the world, environmental sounds, images, and greetings in 55 human languages. The hope was that somehow, sometime, many thousand years from now, extraterrestrials might pick it up and experience a slice of human culture. In 1977 the idea that there might be non-human life “out there” was a pipe dream, but in the intervening years we have discovered a large number of exoplanets. By now the tables are turned: it is statistically more likely than not that there is intelligent life on other planets. We will follow the big questions the Golden Record raises: What would happen if someone found the Golden Record at the other end? What does listening mean in this vast context? (Do aliens have ears?) How do we represent human culture to other unknown civilizations? How do we teach extraterrestrials how to use the Golden Record? It will take over 40,000 years for Voyager to get close to the nearest star—will human culture exist then? Even if you are not planning to major in interplanetary musicology, this seminar sets you off on a trajectory that can help you with both arts and sciences.
MUSLIM VOICES IN CONTEMPORARY WORLD LITERATURES
Ali S. Asani (Committee on the Study of Religion)

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

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

MY GENES AND CANCER
Giovanni Parmigiani (Harvard T.H. Chan School of Public Health)

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

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

The role of a person’s genetic background in determining whether he or she will develop cancer, and when, is at the center of public discussions and active scientific investigations. Already, one’s genetic background is used in making life-altering health decisions aimed at preventing the occurrence of cancer, as was recently the case with actor Angelina Jolie. This seminar will explore the extent to which current scientific knowledge can inform this type of decisions. The goal is to gain enough understanding of the scientific background to critically evaluate the discourse of a genetic counseling session. The seminar will proceed at first by laying essential foundations of genetic inheritance in humans; cancer evolutionary theories; statistical risk; and decision-making in health care. Subsequently, student will read articles from the scientific and popular press, and listen to podcasts. In class we will discuss the readings. There is a good deal of reading and listening, which everyone is expected to do ahead of class. Students can expect readings in genetics and statistics that will stretch them, though it will not always be necessary to understand all the technical details of every paper. Students can also expect to read opinion pieces with which they (as well as I) may disagree. Students will be required to present summaries of the assigned readings, and lead class discussions. They will also be required to write one 5-page double spaced essays at the end of the class, and to lead a class discussion on the topic of their papers. A typical paper is the critique of a scientific or popular press article, chosen from a list of suggested options or identified independently by the student, with my approval, during the first seven weeks of classes. Attendance is essential, not only for the students’ education, but for the benefit their contributions provide to the others.
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 often very high literary quality of his writing. In this seminar, we explore Nietzsche’s moral and political philosophy with emphasis on the themes he develops in his best-known and most accessible work, *The Genealogy of Morality*. The best-known themes from this book include the slave rebellion in morality, ressentiment, bad conscience, and ascetic ideals. However, we also read several other of Nietzsche’s works, and do so chronologically (except that we begin with his 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.

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

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

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

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

Prerequisites: 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.

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

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

Prerequisite: All required reading will be in English.

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

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

The possible importance of clandestine foreign agents, or spies, has recently become an issue in American politics. However, the use of spies was many centuries ago taken extremely seriously by political theorists in the pre-modern Chinese, South Asian, and Roman worlds, by Sun Tzu, Kautilya, and Livy, respectively. Sun Tzu emphasized the use of spies to see into the mind of the enemy in order to defeat his plans. Kautilya and Livy focused more on the role that secret agents could play in uncovering and exploiting the internal divisions in the society and elite of the enemy. What is surprising is the relative absence of similar systematic consideration of spies by modern political scientists after Machiavelli. Is that because spies still exist but are not as important? If that is true, why is it true? If spies are still important, how can we understand and assess their importance? This seminar will begin by reading the theorists of espionage, but then turn to the empirical study of the use of spies to collect secret information, or intelligence, and to carry out subversion, the clandestine disruption of the normal functioning of a government. Questions to be addressed include whether democracies are more or less vulnerable to espionage than tyrannies? What are the effects of counter-intelligence? The theoretical and empirical analysis will at the end of the seminar be used to help us understand current questions.

PREDICTING LIFE AND DEATH—QUANTITATIVE APPROACHES TO HUMAN HEALTH AND DISEASE
Franziska L. Michor (Department of Stem Cell and Regenerative Biology (FAS) and Harvard T. H. Chan School of Public Health)

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

Prerequisites: There are no prerequisites for this seminar.

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

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

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

Prerequisite: A familiarity with some basic concepts in biology and chemistry will be helpful but by no means essential.

Psychoactive molecules change brain function in ways that result in altered perception, mood, or consciousness, and while psychoactive hints at something illicit, these molecules are also useful or potentially useful treatments for pain, depression, and PTSD among others. After an introductory session, the seminar begins with two meetings focused on synapses and neurotransmitters. Subsequent meetings begin with opioids and cannabinoids that indirectly influence important neurotransmitters with case studies involving heroin, heroin derivatives like Oxycontin and Narcan, and synthetic opioids like fentanyl. The cannabinoid meetings will deal with THC and anandamide, our body’s own cannabinoid. The next few meetings will focus on the monoamines including both the monoamine neurotransmitters dopamine, serotonin, and norepinephrine as well as their synthetic mimics like amphetamine, methamphetamine, and ketamine. The final meetings will focus on psychedelics (mescaline, LSD, and psilocybin) and designer drugs. The seminars are discussion based and cover wide-ranging issues. For example the seminars on opioids also explore our brain’s reward system; the nature of addiction; the connection between opioids, alcohol abuse, and genes; the connection between opioid sensitivity and human bonding; and the ‘opioid epidemic.’

THE PSYCHOLOGICAL ROOTS OF OPPRESSION
James Sidanius (Department of Psychology and of African and African American Studies)

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

Why are people so willing to humiliate, oppress and even massacre people from other social groups? What are the obstacles impeding the construction of truly multi-ethnic societies in which people from all ethnic groups function as equal partners in the pursuit of the national project? What are the factors responsible for the horrors of the Holocaust and similar acts of genocide in places such as Rwanda, Cambodia and Myanmar? In this seminar we will explore those aspects of human nature which lie at the root of the seemingly intractable problem of social exclusion and oppression. We will explore the cognitive, affective and motivational components of intergroup brutality by taking an excursion through both classical and contemporary approaches used by social scientists to come to grips with the psychology of social exclusion. This seminar will provide students with an overview of the major theoretical and methodological perspectives informing our understanding of the psychology of prejudice and oppression in modern society. These various theoretical perspectives will span disciplines such as social, political and evolutionary psychology, sociology, political science, and anthropology.
QUANTUM MECHANICS FACE TO FACE
Melissa Franklin (Department of Physics)

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

This seminar 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 Schrödinger, and each week watch and play with physics demonstrations of wave and particle physics. This seminar 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.

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

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

Leo Tolstoy’s massive masterwork War and Peace (1869) is a magnificent work of art by a world-class writer tackling life’s “big questions.” It is also a great read! Over the course of a semester, we will give this nineteenth-century novel the time and attention it deserves. We will read War and Peace closely, while comparing two different English-language translations, exploring cultural and historical context, artistic biography, historiography, the novel as a literary form, literary language, issues in translation, interpretive paradigms, and potential new ways of reading. We will trace the changing interpretative approaches to War and Peace from the 1860s to the present. How does the pacing of the novel relate to nineteenth-century reading and publishing practices? To nineteenth-century conceptions of time, space, narrative, and genre? What are the problematic distinctions between history and literature that the novel raises? We will also consider the significance of the Napoleonic wars (1803-1815) in Russian history and the broader pan-European cultural legacy of this period, including literature, art, and architecture.

This was the best class I have ever taken. Of all of my classes this semester, this was the one which I truly enjoyed the work and looked forward to every week. Taking this seminar has been one of the greatest academic decisions of my life.
REGULATING ONLINE CONDUCT: SPEECH, PRIVACY, AND THE USE AND SHARING OF CONTENT
Christopher T. Bavitz (Harvard Law School)

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

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

It’s designed to ease you into the type of work that may be required later in your time at Harvard [...]. On top of that, you’ll be able to do things that even other students might not have access to. This includes gaining access to museum storage and 3-D educational model.
REGULATION OR ANARCHY? THE STATE AND ITS CRITICS
Susanna C. Siegel (Department of Philosophy)

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

What are law and government for? What makes them important, and what do they mean to you? Laws can seem abstract and impractical. If no one else is at the intersection and you can see for miles in every direction, do you really have to stop? Teenagers tend to shoplift more than people of other ages. Do you think that’s because they tend not to feel the force of law as strongly as people who don’t? In this seminar we’ll consider some of the most basic justifications offered for government, as well as the opposing idea that people could be better off without any government at all. As previously deeply entrenched political institutions in the U.S., Europe and India are increasingly challenged and destabilized, our readings will introduce systematic challenges to the state and fundamental defenses of it. One of our goals is to locate authoritarian forms of government in relation to both sides of this debate. Relative to democracy, authoritarianism scales back the state in some ways and strengthens it in others. Readings draw from philosophy, legal thought, political science and ancient history, and authors include Plato, Hobbes, James C. Scott, and Frederick Schmitt, as well as contemporary business moguls who argue that a small echelon of super-wealthy should control the basic resources needed for human life. Since we’re going work through these ideas and texts together, we’ll need all the help from each other that we can get: all the viewpoints, intuitions, experiences, and background assumptions. So bring your minds, your curiosity, and your imagination, and let’s learn and read and discuss these basic questions about society together.

RELIGION, NEUROSCIENCE, AND THE HUMAN MIND
David C. Lamberth (Harvard Divinity School)

Freshman Seminar 63E 4 credits (spring term) Enrollment: Limited to 12

More than 150 years after Darwin’s epochal account of evolution, over 85% of the world’s 7 billion people are still religious, and the percentage is growing. What does religion do for human beings? What does an evolutionary and biologically informed understanding of the mind and brain lead us to think about where religion fits in human life? Harvard’s first psychologist, William James, engaged these questions in the late nineteenth century, bringing the cutting edge of empirical psychology to the philosophy of religion. Today these same questions animate the field of neuroscience, where researchers are showing how affectivity, emotions, and our evolutionary past come together to form the “self” philosophers have long thought to be primarily “rational.” This seminar brings together the thought of James, writing at the turn of the twentieth century, with the work of contemporary neuroscientist Antonio Damasio to ask what kinds of beings we are, how our minds function, and what religion contributes to human individual and societal experience? The seminar takes up the philosophy of belief, affect, and emotion, and touches on the biology of the brain and homeostasis. We conclude by assessing contemporary views of religion from evolutionary psychology (Boyer, Atran) and cultural anthropology (Geertz, Luhrmann, Asad) in light of James’s and Damasio’s models of the human mind.
RESEARCH AT THE HARVARD FOREST—GLOBAL CHANGE ECOLOGY: FORESTS, ECOSYSTEM FUNCTION AND THE FUTURE
David R. Foster (Department of Organismic and Evolutionary Biology)

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

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

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

THE ROLE OF GOVERNMENT
Oliver D. Hart (Department of Economics)

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

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

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

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

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

THE SCIENCE OF SAILING
Jeremy Bloxham (Department of Earth and Planetary Sciences)

Freshman Seminar 22I 4 Credits (fall term)  Enrollment: Limited to 12

Prerequisites: Participants in this seminar should have a good high school physics background and have some knowledge of sailing.

In this seminar we explore how to use simple physics to understand a range of natural phenomena associated with sailing. Beginning with a discussion of hydrostatics and stability, the seminar moves on to explore in depth the generation of lift and drag by the flow of air over sails and the flow of water over keels and rudders, examining critically the numerous incorrect explanations in the popular literature. We also examine the environment in which a sailboat operates, discussing atmospheric circulation on a range of length scales, waves in deep and shallow water, and tides and currents. Scaling laws and dimensional analysis are introduced and used throughout the seminar.
**THE SECRETS OF STRADIVARIUS OR WHAT MAKES THE VIOLIN SOUND BEAUTIFUL?**  
Philippe Cluzel (Department of Molecular and Cellular Biology)

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*Note: Students are not expected to know any of the concepts and tools used in class, but in view of the highly interdisciplinary nature of the project, the ideal class would comprise individuals with strong interests in either architecture, computer science, physics, biology, music, or an affinity with hand tools and tinkering. There will be no cost to students.*

This is an exploratory seminar that draws concepts from many different fields ranging from music to evolution, machine learning, physics, biology, wood carving, and neuro-aesthetics. The goal of the seminar is to discuss the different concepts needed to understand the design of a violin and to propose new methods and technology to improve the quality of the sound it produces. Students will spend most of their time developing hands-on experiments whose final goal will be to transform low-cost violins into beautiful-sounding instruments using the ideas developed through the readings.

**THE SEVEN SINS OF MEMORY**  
Daniel L. Schacter (Department of Psychology)

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

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

Note: Students are required to participate in a trip during class time to the Harvard Art Museums. There will also be two required evening film screenings.

The words “Silk Road” conjure up images of camel caravans crossing vast deserts and traversing lofty mountains with precious cargoes of textiles and porcelain. From ancient Chinese travelers and intrepid Buddhist pilgrims to plucky Venetians, swashbuckling Swedes, and adventurous Americans, the Silk Road has produced countless storytellers with enchanting accounts of “East meets West.” But what do we really know about the Silk Road? What if it turns out that much of what we believe about the Silk Road turns out to be a myth? This seminar invites you to embark on your own Silk Road journey, exploring the invention of the idea of the Silk Road, the material and historical reality behind the fabled Eurasian trade routes, and the ways in which different Silk Road stories serve today as artistic inspiration, political capital, and economic stimulus. In the process, we will come to understand the peculiar biology of Bombyx mori, study attitudes toward cultural patrimony, and get hands-on experience in the Harvard museum collections, where the University’s own history and that of the Silk Road intersect. The seminar aims to introduce you to the history of what we know as the Silk Road and to problematize that history in various ways; to expose you to the idea that globalization is a process with no beginning and no end; to challenge you to think about the role of culture in society and politics yesterday and today; and to persuade you that travel is the only way out of the prison of our own consciousness.
FRESHMAN SEMINAR PROGRAM

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.

SPANISH-AMERICAN CULTURE AND SOCIETY IN THE 1960s—THE LAST UTOPIA?
Diana Sorensen (Department of Romance Languages and Literatures and of Comparative Literature)
Freshman Seminar 61C  4 credits (fall term)  Enrollment: Limited to 12

What was it like to be a Latin American student in the sixties? How did that period of social, political and cultural transformation come into being, and what have we inherited from it? We will begin with the Cuban Revolution, and then move across the hemisphere to see its art, fashion, music, film, literature and other cultural forms.
THE STORY OF THE ALTERNATING SIGN MATRIX CONJECTURE

Lauren K. Williams (Department of Mathematics)

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

Prerequisites: This seminar is recommended for students with a strong background in mathematics, including some familiarity with proofs. It would be helpful to have some exposure to combinatorics (permutations, binomial coefficients) and linear algebra (matrix multiplication and determinants of n by n matrices).

This seminar is intended to illustrate how research in mathematics actually progresses, using recent examples from the field of algebraic combinatorics. We will learn about the story of the search for and discovery of a proof of a formula conjectured by Mills-Robbins-Rumsey in the early 1980s: the number of n x n alternating sign matrices. Alternating sign matrices are a curious family of mathematical objects, generalizing permutation matrices, which arise from an algorithm for evaluating determinants discovered by Charles Dodgson (better known as Lewis Carroll). They also have an interpretation as two-dimensional arrangements of water molecules, and are known in statistical physics as square ice. Although it was soon widely believed that the Mills-Robbins-Rumsey conjecture was true, the proof was elusive. Researchers working on this problem made connections to invariant theory, partitions, symmetric functions, and the six-vertex model of statistical mechanics. Finally in 1995, all these ingredients were brought together when Zeilberger and subsequently Kuperberg gave two proofs of the conjecture. In this seminar we will survey the story of the alternating sign matrix conjecture, building up to Kuperberg’s proof. If time permits, we will also get a glimpse of very recent activity in the field, for example the Razumov-Stroganov conjecture.

THE SUPREME COURT AND SOCIAL CHANGE: LESSONS FROM LANDMARK CASES AND KEY REFORM MOVEMENTS

Tomiko Brown-Nagin (Harvard Law School and Department of History [FAS])

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

Justice Oliver Wendell Holmes famously wrote: “The life of the law has not been logic; it has been experience.” This seminar considers the idea of experience—including events external to legal doctrine—affecting the law. It discusses how social movements—groups of citizens mobilized in support of a cause—deploy the Constitution and other types of rights talk to “frame” disputes and move forward their agendas. Seminar participants will discuss how movements crystallize grievances, mobilize supporters, demobilize antagonists and attract bystander support by referencing constitutional rights and other ideas about law. It also considers the effectiveness of movements’ legal strategies. The seminar considers these questions in relation to the abolitionist, woman suffrage, civil rights, women’s rights, anti-poverty, same-sex marriage and Tea Party movements, among other recent reform efforts.
THE SUPREME COURT IN U.S. HISTORY
Richard H. Fallon, Jr. (Harvard Law School)

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

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

THE SURPRISING SCIENCE OF HAPPINESS
Nancy L. 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 seminar, 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 seminar will be didactic, interactive and experiential and provide an introduction to a burgeoning field of scientific inquiry.
THE SYMPHONIES OF DMITRI SHOSTAKOVICH

Anne C. Shreffler (Department of Music)

Freshman Seminar 63C 4 credits (fall term)  Enrollment: Limited to 12

Prerequisites: Ability to read music (treble and bass clefs only). I will choose a mix of students with different musical backgrounds for the class. You do not need to be a classically trained performer.

Note: There will be two required concert trips. One will be to hear the Boston Symphony Orchestra performing Shostakovich’s 2nd Symphony on Nov. 21, 2019 as part of an ongoing project by the BSO and conductor, Andris Nelsons, to record the complete Shostakovich symphonies. There will be no cost to the student.

The symphonies of Dmitri Shostakovich (1906-75) are just as relevant and controversial today as they were during the composer’s lifetime. Shostakovich’s fifteen symphonies span his entire creative life; starting with his First Symphony, which made the 19-year old composer famous overnight, and ending with his Fifteenth, completed four years before his death. As a public genre, the symphony was the perfect vehicle for Shostakovich to react to his tumultuous times and explore the human psyche. The ups and downs of Soviet politics and culture indelibly shaped Shostakovich’s career: the innovative fervor after the Russian Revolution, Stalinism (“Socialist Realism” and the Terror), the Second World War, the post-Stalin “Thaw” after 1956, all the way to the height of the Cold War. Shostakovich was at times encouraged and supported by the Soviet regime, and at other times, reprimanded and punished severely. But Soviet audiences always treasured his work because they heard in it deeply felt emotions that could not be publicly acknowledged. Today’s audiences react just as strongly, for different reasons. In the seminar, we will listen closely to all fifteen of Shostakovich’s symphonies, learning about their musical features and the political contexts in which they were born and received. We will focus on three main themes: 1) composing in a totalitarian state, 2) how music can be said to “narrate,” and 3) the orchestra as sound world. We will work from scores and selected recordings, and will attend a live performance of the Boston Symphony Orchestra.

TALKING, LITERARY ANIMALS

W. James Simpson (Department of English)

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

What do imagined animals have to teach human readers? Why, when literary writers think about hunger, violence, sex, suffering, technology, expressivity, the gods, and education (for example), do they so often draw upon animal behavior to understand human practice? The representation of animals in literature tends to range from the cute to the terrifying, with the beautiful in between: animals are cute when they act like us, beautiful when they express desire, but often terrifying when we realize that we act like them. Cute representation of animals tends to characterize children’s literature, while the beautiful and the terrifying material is on the whole reserved for the grownups (though those boundary lines are by no means uncrossed). Cute animals tend to be small, the beautiful mid-size, and terrifying huge. Either way—cute, beautiful or terrifying—
ing—we need animals to think, no doubt because we are ourselves animals, even if we often pretend not to be. Our habitual ways of looking to animals in order to think about ourselves almost always deploy analogy and/or metaphor; the thought experiment sometimes takes the form of having animals actually cross species lines (animals becoming human, or, more commonly, vice versa). This seminar will focus on extraordinarily brilliant animal literature (funny, mordant, touching, sophisticated) in great European literature, from the last 2000 years. The seminar will also teach students how to read literature. On many weeks we will explore the book history of our texts, including texts held in the astonishing riches of Harvard Library System holdings. Throughout the seminar we will also make frequent reference to visual images of animals. The class will be entirely open to news from evolutionary biology that students bring to it, but its focus is not on the non-human natural world in and for itself; the focus is, rather, on the way in humans represent animals in order to understand human behavior.

TECHNOLOGY VS. NATURE: FROM TOGGLING HARPOONS TO GEOENGINEERING

David W. Keith (Harvard John. A. Paulson School of Engineering and Applied Sciences and Harvard Kennedy School)

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

Note: There will be a required day-hike scheduled on Saturday, September 28th.

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

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

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

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

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

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

What is race? What is law? What does law have to do with race and racial inequality? We talk about these kinds of questions all the time when we discuss familiar cultural touchstones as the *Brown v. Board of Education* decision, the legacy of slavery and Jim Crow, and topics such as the Black Lives Matter movement. In this seminar, we will examine the role law has played throughout American history in creating racial categories, maintaining and eliminating racial hierarchy, and policing the borders between race and other classifications such as gender, sexuality and ethnicity. The civil rights movement taught mainstream Americans that law could be a tool to remedy past sins and made the promise of equality real for all citizens. In recent years, however, this conception of law and its role in the world has been criticized from many quarters, and many of those doubts have coalesced into a field now known as Critical Race Theory. In this seminar, we will bring the long-running dialogue between liberal and critical approaches to race and the law up to the present day. Which approach, or combination of approaches—liberal or critical—best describes our present circumstances? Which would seem to describe a more realistic view of our future? Which provides the tools that we might need to grapple most productively with that future? These are some of the questions we will explore in the seminar.
America is a sleep-starved nation. The Institute of Medicine estimates that between 50 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.

In this seminar, 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 sojourning. 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*. 
### THE TRANSFORMATION OF MARKETING

**Elie Ofek (Harvard Business School)**

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

Marketing, as you will find in this seminar, refers to the set of 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 marketing field. 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 consumer-oriented healthcare setting; and societal trends calling on companies to exhibit greater social responsibility. We will close the seminar by examining issues of marketing leadership. In examining these themes, we will draw upon 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. During the term each student will identify a marketing phenomenon they find intriguing and that reflects concepts covered in class. Students will prepare a one-page summary of this business phenomenon and communicate it in a short presentation. The final paper for the seminar requires students to analyze a case study and turn in a short write up.

### TRANSFORMATIVE IDEAS IN BRAIN SCIENCE: WAR, TECHNOLOGY AND DISEASE PIONEERED DISCOVERY

**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**

**Prerequisites:** No background with this material will be assumed.

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 neuroscience and (molecular, developmental, organismic, evolutionary, or regenerative) biology to history and philosophy of science to neuroeconomics and medicine. 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. Selected historical contexts, often involving war, disease, serendipity, and technology advancement, will be highlighted as advancing knowledge in surprising ways. An inter-disciplinary 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 (JDM). 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 (advances in microscopy, electrical measurement, e.g.), and the state-of-the-art Center for Brain Science imaging facility, providing context.
TRIALS FROM CLASSICAL ATHENS AND MODERN LEGAL DEBATES
Adriaan M. Lanni (Harvard Law School) (SEMINAR CANCELLED)

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

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

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

U.S. ENERGY POLICY AND CLIMATE CHANGE
James H. Stock (Department of Economics)

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

Burning fossil fuels has powered 150 years of unprecedented economic growth, but doing so has left a legacy of high and increasing concentrations of carbon dioxide and other greenhouse gases. Those gases are changing our climate and thereby endanger human health, human welfare, and the earth’s ecosystems. To avoid the worst of those consequences requires decarbonizing the energy sector, but that task is massive and will require effective and efficient climate policy. Recently, U.S. energy and climate policy has been subject to wild swings, as Obama-era regulatory and subsidy policies designed to shift from fossil fuels to renewables have been replaced under the Trump administration by policies to promote and subsidize fossil fuel use and production. This seminar examines U.S. climate policy from economic, legal, and technological perspectives. The seminar starts with a review of the U.S. energy sector, climate science, and climate economics. The seminar then turns to current policy issues, including carbon pricing, the regulation of CO2 emissions from fossil-fuel fired power plants, the keep-it-in-the-ground movement, policies to promote new low-carbon technologies, and the Green New Deal. The seminar also examines subnational (state and local) and international climate policies.
**UNDERSTANDING THE SEEMINGLY IMPOSSIBLE: A REVOLUTION IN BIOLOGY**

Craig P. Hunter (Department of Molecular and Cellular Biology)

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

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

**THE UNIVERSE’S HIDDEN DIMENSIONS**

Lisa Randall (Department of Physics)

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

This seminar will give an overview and introduction to modern physics and cosmology. As with the books, *Warped Passages, Knocking on Heaven’s Door, Higgs Discovery,* and *Dark Matter and the Dinosaurs,* on which it will be loosely based, the seminar will consider important developments in physics today and in the last century. We will consider the revolutionary developments of quantum mechanics and general relativity; and will investigate the key concepts which separated these developments from the physical theories which previously existed. We will then delve into modern particle physics and cosmology and how theory and experiment culminated in the “Standard Model of particle physics” which physicists use today as well as the current cosmological model based on the Big Bang theory and inflation. We will also move beyond the standard theories into more speculative arenas, including supersymmetry, string theory, and theories of extra dimensions of space, as well as ideas about the nature of dark matter. 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.
WAR IN FICTION AND FILM
Justin M. Weir (Department of Slavic Languages and Literatures and of Comparative Literature)

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

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

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

WHAT IS A SPECIES, AND HOW DO SPECIES EVOLVE?
James Mallet (Department of Organismic and Evolutionary Biology)

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

Note: There will be a required trip to the Harvard Museum of Comparative Zoology for the purpose of identifying real species. No background in biology is required. All first-year students are encouraged to apply.

One hundred and fifty years after Darwin wrote On the Origin of Species..., you would think that scientists already have a good definition of species. In fact, a major debate still rages among biologists as to what species are, and how they evolve from other species. This seminar will cover these issues. Darwin used impeccable logic and convinced his readership by the 1860s that the entire diversity of life could be explained by means of evolution. Yet it’s possible that prior creationist notions of species still prevented even most biologists from accepting Darwin’s ideas about the nature of species. We needed a solid theory of heredity to understand what species are and how they evolve, and indeed it was this problem for evolution that led scientists to seek for and ultimately achieve the discovery of DNA. How has genetics and genome science changed our view of species? From 45,000 years ago, Neanderthals coexisted in Eurasia with modern humans for about 3,000-5,000 years. The latest genomic data show that some admixture took place. So, were we the same species? Or two different species? Does it matter? This seminar provides you with tools to make up your own mind on this. Seminar topics range over history, philosophy, and genetics; we explore the uses of species in classifying branches in the tree of life, and in conservation and laws about endangered species.
WHAT IS LIFE?
Guido Guidotti (Department of Molecular and Cellular Biology)

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.

WHY WE ANIMALS SING
Brian D. Farrell (Department of Organismic and Evolutionary Biology)

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 Art, Film, and Visual Studies)

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

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

THE WORLD OF TOMORROW: INHABITING THE TWENTY-FIRST CENTURY
Arthur I. Segel (Harvard Business School)

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

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

Considering the world of tomorrow lends itself to a wide array of considerations. It determines where and how we live, work, play, and dream. Crafting the future embodies concrete stances on a wide variety of social, political, and economic concerns within a society. The quality and availability of affordable housing, for instance, is not merely an economic concern, but also a value judgment about the obligations of a society to its citizens. By examining these issues on a variety of realms, ranging from factory farming to global poverty, students explore the fingerprint of societal values and how they can be a vehicle for both positive and negative change. The seminar weaves together the practical aspects and social factors that will contribute to building the future. 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, artificial intelligence, resource scarcity, economic inequality, and geopolitical conflicts, affect us as both inhabitants and constructors of tomorrow’s world. Week by week, students will partake in conversation and debate with prominent professors, business leaders, and policymakers from around the globe.

“Today, we are shapers of the world of tomorrow. There is no way we can duck the responsibility, and there is no reason why we should.”
—Walt Disney
ZOMBIES AND SPIRITS, GHOSTS AND GHOULS: INTERACTIONS BETWEEN THE LIVING AND THE DEAD
Shaye J. D. Cohen (Department of Near Eastern Languages and Civilizations)

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

Note: There will be a required field trip to Mount Auburn Cemetery in Cambridge, date to be decided.

Virtually all the cultures and religions of the world, from ancient to contemporary times, have teachings and rituals about death. In this seminar we will deal with a subset of this very large topic, namely, the relationship of the living and the dead. The dead are often depicted as still-living in some way and still in communication with us and our world. Are they friendly or hostile? Beneficent or malevolent? Think “undead” and “zombie” versus “saint” and “angel.” In this seminar we will look at some of the myriad ways that religions and cultures conceive of the relationship of the living with the dead. We the living care for the dying and the dead, and hope that the dead will care for us, but how this works exactly is the subject of much speculation. American secular culture, at least in its cinematic expression, has a vigorous belief in the afterlife, especially in having denizens of the afterlife, in the form of zombies, ghosts, and poltergeists, intrude on the world of the living. In our seminar we will survey this rich set of themes as expressed in literature, art, music, cinema, and philosophy.
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<td>Catherine McKenna</td>
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