**SCIENCE, TECHNOLOGY & SOCIETY (STSC)**

**STSC 001 Emergence of Modern Science**
During the last 500 years, science has emerged as a central and transformative force that continues to reshape everyday life in countless ways. This introductory course will survey the emergence of the scientific world view from the Renaissance through the end of the 20th century. By focusing on the life, work, and cultural contexts of those who created modern science, we will explore their core ideas and techniques, where they came from, what problems they solved, what made them controversial and exciting and how they relate to contemporary religious beliefs, politics, art, literature, and music. The course is organized chronologically and thematically. In short, this is a "Western Civ" course with a difference, open to students at all levels.

For BA Students: Hum/Soc Sci or Nat Sci/Math Sector  
Taught by: Kucuk  
Course usually offered in fall term  
Also Offered As: HSOC 001  
Activity: Lecture  
1 Course Unit

**STSC 002 Medicine in History**
This course surveys the history of medical knowledge and practice from antiquity to the present. No prior background in the history of science or medicine is required. The course has two principal goals: (1) to give students a practical introduction to the fundamental questions and methods of the history of medicine, and (2) to foster a nuanced, critical understanding of medicine's complex role in contemporary society. The course takes a broadly chronological approach, blending the perspectives of the patient, the physician, and society as a whole—recognizing that medicine has always aspired to "treat" healthy people as well as the sick and infirm. Rather than history "from the top down" or "from the bottom up," this course sets its sights on history from the inside out. This means, first, that medical knowledge and practice is understood through the personal experiences of patients and caregivers. It also means that lectures and discussions will take the long-discredited knowledge and treatments of the past seriously, on their own terms, rather than judging them by today's standards. Required readings consist largely of primary sources, from elite medical texts to patient diaries. Short research assignments will encourage students to adopt the perspectives of a range of actors in various historical eras.

For BA Students: History and Tradition Sector  
Taught by: Barnes  
Course usually offered in fall term  
Also Offered As: HIST 036, HSOC 002  
Activity: Lecture  
1 Course Unit

**STSC 003 Technology and Society**
Technology plays an increasingly important role in our understandings of ourselves, our communities, and our societies, in how we think about politics and war, science and religion, work and play. Humans have made and used technologies, though, for thousands if not millions of years. In this course, we will use this history as a resource to understand how technologies affect social relations, and conversely how the culture of a society shapes the technologies it produces. Do different technologies produce or result from different economic systems like feudalism, capitalism, and communism? Can specific technologies promote democratic or authoritarian politics? Do they suggest or enforce different patterns of race, class or gender relations? Among the technologies we'll consider will be large objects like cathedrals, bridges, and airplanes; small ones like guns, clocks and birth control pills; and networks like the electrical grid, the highway system and the internet.

For BA Students: Society Sector  
Taught by: Benson  
Course usually offered in spring term  
Also Offered As: HSOC 003, SOCI 033  
Activity: Lecture  
1 Course Unit

**STSC 021 From Darwin to DNA**
Evolution has been one of the productive and important ideas in the history of biology. It has also been a scientific idea with many complex social and political meanings. In this freshman seminar, we explore the history of ideas about evolution, heredity, DNA and genomics, attentive to the profound social dimensions of biological ideas. We consider the political and intellectual history of genetics and genomics, from pre-Darwinian ideas about evolution (there were many theories before Darwin's) to contemporary debates about ancestry testing and creation science. We look at evolution's role in the politics of race, eugenics, creation science and identity. This course will provide students with critical historical and social perspectives on science, technology and medicine.

Taught by: Lindee  
Course not offered every year  
Activity: Seminar  
1 Course Unit

**STSC 026 Relativity and the Philosophy of Space and Time**
This course will present a detailed introduction to Einstein's special and general theories of relativity and will examine their historical development and philosophical significance. No previous physics or philosophy will be presupposed, and only high school mathematics will be used.

For BA Students: Natural Science and Math Sector  
Taught by: Domoter  
Course usually offered in fall term  
Also Offered As: PHIL 026  
Activity: Lecture  
1 Course Unit  
Notes: Also fulfills General Requirement in Science Studies for Class of 2009 and prior
STSC 032 Risky Business
This freshman seminar on medical decision making will focus on personal and public medical and health decisions - how we make them and how they can be improved. While in theory medical decisions are in large part both informed and constrained by scientific evidence, in reality they are much more complex. Drawing upon a range of information sources including original research and popular media, the seminar will introduce students to the challenges of making personal and public (i.e., policy) decisions under conditions of inherent uncertainty and resource constraint. We will examine how research and scholarship can inform and improve such decisions and decision making processes. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally. Using a variety of approaches (class discussions, examination of primary research, popular media, simple experiments, expert guests) this highly interactive seminar will provide a strong introductory foundation to medical decision making specifically and, by extension, to decision making under conditions of uncertainty more generally.

Taught by: Schwartz
Course not offered every year
Also Offered As: HSOC 032
Activity: Seminar
1 Course Unit

STSC 062 American Way of War
Do Americans fight wars differently than do the people of other nations? Are there unique American tactics or technologies? Does America’s success in war owe to its arsenal of sophisticated weapons, or to the fighting spirit of its people? What characterizes the American experience in combat? A respect for limits, or a willingness to win at any cost? And can we even answer these questions, or do the myths we tell ourselves about our past get in the way? This seminar explores the scientific and technological development of warfare in the United States from the time of European settlement of the Americas to the era of unmanned aerial vehicles. The changing nature of warfare beginning in 1775 and continuing through 2014 involved the creation and deployment of increasingly complex and powerful weapons, as well as a corresponding evolution in tactics and strategy.

Course not offered every year
Activity: Seminar
1 Course Unit

STSC 069 Computer Worlds
Taught by: Voskuhl
One-term course offered either term
Activity: Seminar
1 Course Unit

STSC 070 Gaming the Machine
One-term course offered either term
Activity: Seminar
1 Course Unit

STSC 077 Voyages of Discovery
Across the nineteenth century, voyages of sail and steam made possible the creation of empires and a globalized world, through the transportation of people and commodities. Similarly, this course is a voyage of discovery based on the study of actual ship’s logs held in Penn’s Rare Book collection. We will use these accounts to guide our investigation into the science, technology, medicine, economic and environmental history of life at sea and in the ports of call for these ships around the Indian and Atlantic Oceans. Collectively, the seminar will produce an online exhibition built on logs, diaries and other sources held at Penn, in other local collections and gleaned from archives around the world.

Taught by: Petrie
Course not offered every year
Activity: Seminar
1 Course Unit

STSC 078 Everyday Technologies and the Making of the Modern World
Long before iPhones and Fitbits, personal technology — small(ish), portable, purchasable — had a tremendous impact on the lives of people around the globe. Items such as wristwatches, bicycles, sewing machines and radios could empower their users (or sometimes discipline them), creating economic, educational or recreational opportunities while also being associated with grander ideas and ideologies. This course will explore such everyday technologies across the nineteenth and twentieth centuries, in locations spanning the Americas, Europe, Africa and Asia. We will consider how the use and significance of particular technologies varied according to time and place; how these everyday items could contribute to “self-fashioning” for individuals, nations, and empires; and how, through use and modification, consumers themselves could become part of the story of technological change. In addition to reading a variety of classic and recent scholarship, students will work with a wide array of primary sources (newspapers, photographs, patent records, trade cards) and use digital tools to present their own research projects.

Taught by: Petrie
Activity: Seminar
1 Course Unit

STSC 079 Animal City: Humans & Animals in Urban America 1850-present
Cities are popularly viewed as the opposite of Nature; animals are popularly viewed as the embodiment of Nature. Yet history and our own observations inform us that animals have always been and continue to be part of city life. Furthermore, most of the many roles that animals play in human lives, and most of the relationships between animals and humans take place in urban settings. In this freshman seminar, we examine human/animal relationships in urban society around the globe. Items such as wristwatches, bicycles, sewing machines and radios could empower their users (or sometimes discipline them), creating economic, educational or recreational opportunities while also being associated with grander ideas and ideologies. This course will explore such everyday technologies across the nineteenth and twentieth centuries, in locations spanning the Americas, Europe, Africa and Asia. We will consider how the use and significance of particular technologies varied according to time and place; how these everyday items could contribute to “self-fashioning” for individuals, nations, and empires; and how, through use and modification, consumers themselves could become part of the story of technological change. In addition to reading a variety of classic and recent scholarship, students will work with a wide array of primary sources (newspapers, photographs, patent records, trade cards) and use digital tools to present their own research projects.

Taught by: Petrie
Activity: Seminar
1 Course Unit
### STSC 107 Science, Technology & Medicine in Colonial India
In this course we will explore the broad contours of the histories of Science, Medicine and Technology in Colonial India (c. 1757 - 1947). This broad overview will be developed each week through a case study based on any one particular scientific discipline, technological project or medical event. Overall the course will attempt to locate the development of science, technology and medicine within the social, political and cultural context of colonial India. It is also worth noting that 'Colonial India', will include discussions of regions which today make up the Republic of India, Pakistan and Bangladesh. 
Taught by: Mukharji
One-term course offered either term
Also Offered As: HSOC 107
Activity: Seminar
1 Course Unit

### STSC 108 Introduction to Philosophy of Science
A discussion of some philosophical questions that naturally arise in scientific research. Issues to be covered include: The nature of scientific explanation, the relation of theories to evidence, and the development of science (e.g., does science progress? Are earlier theories refuted or refined?).
Taught by: Domotor
Course not offered every year
Also Offered As: COML 224, PHIL 225
Activity: Seminar
1 Course Unit

### STSC 110 Science and Literature
This course will explore the emergence of modern science fiction as a genre, the ways it has reflected our evolving conceptions of ourselves and the universe, and its role as the mythology of modern technological civilization. We will discuss such characteristic themes as utopias, the expropriation of space and time, biological engineering, superman, robots, aliens, and other worlds--and the differences between European and American treatment of these themes.
For BA Students: Arts and Letters Sector
Taught by: Adams
Course usually offered in spring term
Also Offered As: COML 074, ENGL 075, HIST 117, HSOC 110
Activity: Lecture
1 Course Unit

### STSC 123 Darwin's Legacy: The Evolution of Evolution
Darwin's conceptions of evolution have become a central organizing principle of modern biology. This lecture course will explore the origins and emergence of his ideas, the scientific work they provoked, and their subsequent re-emergence into modern evolutionary theory. In order to understand the living world, students will have the opportunity to read and engage with various classic primary sources by Darwin, Mendel, and others. The course will conclude with guest lectures on evolutionary biology today, emphasizing current issues, new methods, and recent discoveries. In short, this is a lecture course on the emergence of modern evolutionary biology--its central ideas, their historical development and their implications for the human future.
For BA Students: Living World Sector
Taught by: Gil-Riano
Course usually offered in spring term
Also Offered As: HSOC 123
Activity: Seminar
1 Course Unit

### STSC 135 Modern Biology and Social Implications
This course covers the history of biology in the 19th and 20th centuries, giving equal consideration to three dominant themes: evolutionary biology, classical genetics, and molecular biology. The course is intended for students with some background in the history of science as well as in biology, although no specific knowledge of either subject is required.
We will have three main goals: first, to delineate the content of the leading biological theories and experimental practices of the past two centuries; second, to situate these theories and practices in their historical context, noting the complex interplay between them and the dominant social, political, and economic trends; and, third, to critically evaluate various methodological approaches to the history of science.
For BA Students: Natural Science and Math Sector
Taught by: Ceccatti
One-term course offered either term
Also Offered As: HIST 035
Activity: Seminar
1 Course Unit

### STSC 145 Comparative Medicine
This course explores the medical consequences of the interaction between Europe and the "non-West." It focuses on three parts of the world Europeans colonized: Africa, South Asia, and Latin America. Today's healing practices in these regions grew out of the interaction between the medical traditions of the colonized and those of the European colonizers. We therefore explore the nature of the interactions. What was the history of therapeutic practices that originated in Africa or South Asia? How did European medical practices change in the colonies? What were the effects of colonial racial and gender hierarchies on medical practice? How did practitioners of "non-Western" medicine carve out places for themselves? How did they redefine ancient traditions? How did patients find their way among multiple therapeutic traditions? How does biomedicine take a different shape when it is practiced under conditions of poverty, or of inequalities in power? How do today's medical problems grow out of this history? This is a fascinating history of race and gender, of pathogens and conquerors, of science and the body. It tells about the historical and regional roots of today's problems in international medicine.
For BA Students: History and Tradition Sector
Taught by: Mukharji
Course usually offered in fall term
Also Offered As: HIST 146, HSOC 145
Activity: Lecture
1 Course Unit

### STSC 152 Chinese Science
This course explores the social, cultural and political contexts of scientific knowledge in China over the course of two millennia, through a diverse cast of historic actors spanning emperors and midwives, Buddhist monks and Jesuits, eminent authorities and everyday people. We will examine the evolution of various learned traditions (astronomy, alchemy, medicine, natural history) that sought to define and understand the heavens, the earth and the body - and the manner in which those forms of knowledge could be deployed for the good of state, society or individual. In the process, we will compare Chinese experience to other cultures and evaluate the status and dynamics of Chinese traditions in the modern era of Western political and scientific dominance. No prior knowledge of Chinese history is assumed. Class discussion will be a part of each meeting.
One-term course offered either term
Also Offered As: HSOC 157
Activity: Lecture
1 Course Unit
STSC 160 The History of the Information Age
Certain new technologies are greeted with claims that, for good or ill, they must transform our society. The two most recent: the computer and the Internet. But the series of social, economic and technological developments that underlie what is often called the Information Revolution include much more than just the computer. In this course, we explore the history of information technology and its role in contemporary society. We will explore both the technologies themselves—calculating machines, punched card tabulators, telegraph and telephone networks, differential analyzers, digital computers, and many others—and their larger social, economic and political contexts. To understand the roots of these ideas we look at the prehistory of the computer, at the idea of the post-industrial or information society, at parallels with earlier technologies and at broad historical currents in the United States and the world.
For BA Students: Humanities and Social Science S
Taught by: Dick
One-term course offered either term
Also Offered As: SOC 161
Activity: Lecture
1 Course Unit

STSC 162 Technology and Medicine in Modern America
Medicine as it exists in contemporary America is profoundly technological; we regard it as perfectly normal to be examined with instruments, to expose our bodies to many different machines; and to have knowledge produced by those machines mechanically/electronically processed, interpreted and stored. We are billed technologically, prompted to attend appointments technologically, and often buy technologies to protect, diagnose, or improve our health: consider, for example, HEPA-filtering vacuum cleaners; air-purifiers; fat-reducing grills; bathroom scales; blood pressure cuffs; pregnancy testing kits; blood-sugar monitoring tests; and thermometers. Yet even at the beginning to the twentieth century, medical technologies were scarce and infrequently used by physicians and medical consumers alike. Over the course of this semester, we will examine how technology came to medicine’s center-stage, and what impact this change has had on medical practice, medical institutions and medical consumers - on all of us!
Taught by: Johnson
Course usually offered summer term only
Also Offered As: HSOC 152
Activity: Seminar
1 Course Unit

STSC 168 Environment and Society
This course examines contemporary environmental issues such as energy, waste, pollution, health, population, biodiversity and climate through a historical and critical lens. All of these issues have important material, natural and technical aspects; they are also inextricably entangled with human history and culture. To understand the nature of this entanglement, the course will introduce key concepts and theoretical frameworks from science and technology studies and the environmental humanities and social sciences.
For BA Students: Humanities and Social Science S
Taught by: Benson
Course not offered every year
Activity: Lecture
1 Course Unit

STSC 169 Engineering Planet Earth
Taught by: Benson
One-term course offered either term
Also Offered As: ENVS 169
Activity: Lecture
1 Course Unit

STSC 179 Environmental History
This course provides an introduction to environmental history—the history of the interrelationship between humans and the rest of nature. In the words of historian J.R. McNeill, “Human history has always and will always unfold within a larger biological and physical context, and that context evolves in its own right. Especially in recent millennia, that context has co-evolved with humankind.” In this course we will study this co-evolution between human actors and non-human actors in global history, analyzing political, social, cultural and economic factors that affect ideas about nature and material effects on nature. We will consider the concept of the Anthropocene and study current environmental changes and challenges.
Taught by: Greene, A
Course not offered every year
Also Offered As: HSOC 179
Activity: Lecture
1 Course Unit

STSC 201 Hist Phys Sci 19th & 20th Century
Over the last two centuries, scientists have produced a broad range of knowledge about the physical world, from light to electromagnetism to atoms to nuclei, facilitating or explaining an ever increasing mastery over the natural world. Becase of their success, these developments played an important role in forming our views of how to effectively generate knowledge of the natural world. This course will examine some of the major developments in the physical sciences during the 19th and 20th century, asking how that knowledge and the means by which it was produced related to institutions, technical practices and broader cultural knowledge and knowledge production to explore how past practices have, or have not, left their traces in later science. The course will meet twice a week for lecture and discussion. Readings will consist of Pursuing Power and Light: Technology and Physics from James Watt to Albert Einstein by Bruce J. Hunt When Physics Became King by Iwan Rhys Morris Night Thoughts of a Classical Physicist by Russel McCormmach as well as articles from a course reader. Students will produce three short papers (about three pages) and a term paper (about ten pages)
Taught by: Ashrafi
Course not offered every year
Activity: Lecture
1 Course Unit

STSC 203 Science, Medicine and Technology in Africa
Course not offered every year
Activity: Lecture
1 Course Unit

STSC 208 Science and Religion: Global Perspectives
This survey course provides a thematic overview of science and religion from antiquity to the present. We will treat well-known historical episodes, such as the emergence of Muslim theology, the Galileo Affair and Darwinism, but also look beyond them. This course is designed to cover all major faith traditions across the globe as well as non-traditional belief systems such as the New Age movement and modern Atheism
Taught by: Kucuk
Course not offered every year
Activity: Seminar
1 Course Unit
STSC 209 Race and Gender in Global Science
This course critically examines the creation of scientific conceptions of 'race' and 'sex' in the modern era and their global impact. How did 'race' and 'sex' come to be the primary categories through which human variation has been classified in the modern West? What concepts of 'race' and 'sex' did colonial scientists, doctors, naturalists, and other experts invent, and how and why did they do this? How have scientific conceptions of 'race' and 'sex' been adapted to fit the sociopolitical projects of formerly colonized regions? And how have recent developments in genomic science sought to reinvent these categories? With these questions in mind, this course challenges us to think critically about the political contexts in which conceptions of 'race' and 'sex' have been crafted as well as how they have been contested and re-defined.
Taught by: Gil-Riano
Course usually offered in spring term
Also Offered As: HSOC 209
Activity: Seminar
1 Course Unit

STSC 212 Science Technology and War
In this survey we explore the relationships between technical knowledge and war in the nineteenth and twentieth centuries. We attend particularly to the centrality of bodily injury in the history of war. Topics include changing interpretations of the machine gun as inhumane or acceptable; the cult of the battleship; banned weaponry; submarines and masculinity; industrialized war and total war; trench warfare and mental breakdown; the atomic bomb and Cold War; chemical warfare in Viet Nam; and "television war" in the 1990s.
For BA Students: Humanities and Social Science S
Taught by: Lindee
Course not offered every year
Also Offered As: HSOC 212
Activity: Lecture
1 Course Unit

STSC 217 Science, Technology and Development in South and Southeast Asia
Taught by: Petrie
Course not offered every year
Activity: Seminar
1 Course Unit

STSC 231 Insect Epidemiology Pests, Pollinators and Disease Vectors
Malaria, Dengue, Chagas disease, the Plague- some of the most deadly and widespread infectious diseases are carried by insects. The insects are also pernicious pests; bed bugs have returned from obscurity to wreak havoc on communities, invasive species decimate agricultural production, and wood borers are threatening forests across the United States. At the same time declines among the insects on which we depend- the honeybees and other pollinators—threaten our food security and ultimately the political stability of the US and other nations. We will study the areas where the insects and humans cross paths, and explore how our interactions with insects can be cause, consequence or symptom of much broader issues. This is not an entomology course but will cover a lot about bugs. It's not a traditional epidemiology course but will cover some fascinating epidemiological theory originally developed for the control of disease vectors. It will cover past epidemics and infestations that have changed the course of the history of cities and reversed advancing armies. HSOC 241. Stem Cells, Science and Society. Gearhart/Zaret.
Taught by: Levy
Course not offered every year
Also Offered As: HSOC 231
Activity: Seminar
1 Course Unit

STSC 260 Cyberculture
Computers and the internet have become critical parts of our lives and culture. In this course, we will explore how people use these new technologies to develop new conceptions of identity, build virtual communities and affect political change. Each week we'll see what we can learn by thinking about the internet in a different way, focusing successively on hackers, virtuality, community, sovereignty, interfaces, algorithms and infrastructure. We'll read books, articles, and blogs about historical and contemporary cultures of computing, from Spacewar players and phone phreaks in the 1970s to Google, Facebook, World of Warcraft, WikiLeaks, and Anonymous today. In addition, we'll explore some of these online communities and projects ourselves and develop our own analyses of them.
Taught by: Dick
One-term course offered either term
Also Offered As: ANTH 260, SOCI 260
Activity: Seminar
1 Course Unit

STSC 261 Topics in US History
Taught by: Greene, A
One-term course offered either term
Also Offered As: HIST 231
Activity: Seminar
1 Course Unit

STSC 269 Computers, Ethics, and Social Values
This course will explore the various social implication of information technology, social, cultural, political and economic. Topics will include technology policy, organizational change, globalization and the digital divide, intellectual property rights, Linux and the free software movement, cyber libertarianism, and the rise and fall of the dot.com economy.
Course not offered every year
Activity: Seminar
1 Course Unit
**STSC 270 Digital Democracy**  
Technological infrastructure shapes what forms of political life are possible within a society. Political campaigns, investigative journalism, public engagement, protest, government - all unfold on different time scales, in different forms, and with different consequences depending on what machines mediate them. This course explores the forms of American political life that have taken shape in and through modern digital computing. We will investigate especially a perceived tension at the heart of computing technologies - from artificial intelligence to social media - as they have been introduced to so many corners of American political life: Are computing technologies agents of liberation, or of control? The internet, for example, was embraced by some as an inherently democratizing and liberating force, giving users equal access to voice and information. On the other hand, many feared the internet as an unprecedented platform for corporate and government surveillance and manipulation. This course will analyze and historicize this tension, looking to unpack the complex and controversial role of computers in American political life from the Cold War to POTUS.  
Taught by: Dick  
Course usually offered in fall term  
Activity: Seminar  
1 Course Unit

**STSC 272 Energy in America**  
Energy issues are central to all aspects of American life - social, cultural, environmental, political and economic. The United States possesses abundant energy resources, and Americans have long enjoyed high, even profligate energy consumption. With 5% of the world's population, the United States currently consumes 24% of the world energy. How did the United States' energy system come to be? This course looks at how this energy system developed over time, in order to understand how Americans' energy choices have been shaped by environmental conditions, economic arrangements, political practices, social structures, and cultural values. It examines the kinds of energy and power used by Americans, energy adoption and transitions, the development of power systems, the role of consumption, and the influence of energy beliefs. It emphasizes the themes of system, contingency, complementarity, and choice. Ongoing topics are the history of energy at the University of Pennsylvania and in the mid-Atlantic region, the meaning of energy efficiency, and the problem of sustainable energy.  
Taught by: Greene, A  
Course not offered every year  
Activity: Seminar  
1 Course Unit

**STSC 279 Nature's Nation: Americans and Their Environment**  
The United States is "nature's nation." Blessed with an enormous, resource-rich geographically diverse and sparsely settled territory, Americans have long seen "nature" as central to their identity, prosperity, politics and power, and have transformed their natural environment accordingly. But what does it mean to be "nature's nation? This course describes and explores how American "nature" has changed over time. How and why has American nature changed over the last four centuries? What have Americans believed about the nation's nature, what have they known about the environment, how did they know it and how have they acted on beliefs and knowledge? What didn't or don't they know? How have political institutions, economic arrangements, social groups and cultural values shaped attitudes and policies? How have natural actors (such landscape features, weather events, plants, animals, microorganisms) played roles in national history? In addition to exploring the history of American nature, we will look for the nature in American history. Where is "nature" in some of the key events of American history that may not, on the surface, appear to be "environmental?"  
Taught by: Greene, A  
Course not offered every year  
Also Offered As: ENVS 279, HIST 320, HSOC 279  
Activity: Seminar  
1 Course Unit

**STSC 288 Knowledge and Social Structure**  
Throughout human history, the relationships of science and religion, as well as of science and magic, been complex and often surprising. This course we cover topics ranging from the links between magic and science in the seventeenth century to contemporary anti-science movements.  
For BA Students: Humanities and Social Science S  
One-term course offered either term  
Also Offered As: SOCI 282  
Activity: Seminar  
1 Course Unit

**STSC 299 Independent Study**  
One-term course offered either term  
Activity: Independent Study  
1 Course Unit

**STSC 307 Globalization & Medicine in Colonial & Postcolonial South Asia**  
This seminar will explore a wide range of themes at the intersection of globalization and therapeutic cultures in South Asia and amongst South Asian diasporas. To begin with the course understands 'supraterritoriality' as the key feature of globalization and proceeds to interrogate the myriad ways in which this supraterritoriality was produced, consumed, used and dabused within the therapeutical cultures that have been, and on occasion still are, available in South Asia-both in reality and symbolically. Each week, through a specific case study, framed by a few theoretical readings, we will attempt to deepen and problematize the simple definition of globalization with which we start the course. Throughout the course there will be a strong emphasis on combining case study-based empirical material and theoretical interventions in Cultural Theory and Postcolonial Studies.  
Taught by: Mukharji  
One-term course offered either term  
Also Offered As: HSOC 307  
Activity: Seminar  
1 Course Unit
STSC 308 Science, Technology and Global Capitalism
Modern capitalism has been defined by the circulation of commodities, from gold in the 16th century to sugar in the 17th, tobacco in the 18th, cotton in the 19th, oil in the 20th, and financial derivatives in the 21st. But the world is always messy and complex, rather than neatly divided into products and goods. How, why, and for whose benefit do we divide nature into the abstractions of the marketplace? Who holds power over where, why, and how that happens? In this seminar, we'll use a wide range of scholarship from the humanities, social sciences, and the sciences, along with primary texts and other sources, in order to understand the close links among global capitalism, science and technology, and the natural world.?

One-term course offered either term
Activity: Seminar
1 Course Unit

STSC 310 Futurology
This seminar will explore past attempts by scientists and visionaries to predict the future. After exploring the nature and methodological problems inherent in prognostication that have caused most such attempts to fail, we will focus on a series of interesting essays, stories, and visionary works that seem to have successfully foreseen aspects of the world we live in, and attempt to analyze what they got right, what they got wrong, and why. We will conclude with critical, historically informed analysis of some current scientific prognostications about our short, intermediate, and longer term destiny. Grading will be based on class participation, student reports, several short papers, and a final research paper.

Taught by: Adams
Course not offered every year
Prerequisites: STSC 001,STSC 110
Activity: Seminar
1 Course Unit

STSC 312 Weapons of Mass Destruction
The course explores the historical development of traditional weapons of destruction such as chemical, nuclear and biological agents, in addition to newer and seemingly non-traditional weapons such as land mines and civilian aircraft that can also be employed to cause large numbers of injuries and deaths among civilian and military populations. Through case studies in technology and public health, students will evaluate the medical, scientific, environmental, and cultural ramifications of these weapons and their effect on human heal and society by analyzing the rise of the military-industrial-academic-complex in twentieth century America.

Taught by: Lindee
One-term course offered either term
Also Offered As: HSOC 312
Activity: Seminar
1 Course Unit

STSC 314 Cosmopolitan Urbanism: Rio de Janeiro
Taught by: Barber/Tresch
Course not offered every year
Activity: Seminar
1 Course Unit

STSC 316 Science, Technology and Society in Modern East Asia
The course aims to survey the history of science and technology in East Asian countries—China, Japan and Korea—since the late 19th century. Since Japan was the only nation in East Asia that succeeded in modernizing itself by adopting Western science, technology and politics, it will be studied first. The Chinese and Korean cases then will be reviewed with different angles. The course will emphasize the mutual influence between science & technology and society to answer how these countries became major industrial powers in the 21st century.

Taught by: KIM
Course not offered every year
Activity: Seminar
1 Course Unit

STSC 318 Experiment in the Modern Life Sciences
Experiences on living material are now controversial for ethical reasons (think stem cells, animal experimentation and animal rights, etc.), but the scientific merit of experimenting on the living is rarely challenged. We tend to take for granted that experiments are the best way to understand biology, but in the nineteenth century, the opposite was true. Why has this changed, and what are the implications of the change? Is the appearance of consensus around the role of experiment in biology simply a false impression? These are the sorts of questions that this course will explore through popular, scientific, and historical literature.

Course not offered every year
Activity: Seminar
1 Course Unit

STSC 322 Edgar Allan Poe's Science
You probably read Poe first in junior high, and his works are often treated as juvenile: cheap thrills, campy horror, self-indulgent longing. But Poe also engaged with the most serious issues faced by his period, from politics and philosophy to industrialization and science. His works dealt with these concerns in a variety of ways, while reflecting all along about the conditions of literature in a newly commercialized marketplace. This seminar will look at Poe's literary innovations through the lens of the developing technology and science of the early republic. It will examine the political importance of new institutions for research and diffusion as well as various emerging venues for popular science, including the journals in which Poe wrote as an early science reporter. The course explores the peculiar situation of science and technology in the early USA, at the same time as it reveals the varied and complex literary production of Poe in a new and revealing light.

Taught by: Tresch
One-term course offered either term
Activity: Seminar
1 Course Unit

STSC 328 What is Prediction?
This course is an investigation into the notion of prediction from antiquity to the present. By looking closely at key practices from Homeric divination to modern actuarial science and from early modern astrology to contemporary climate models, the course seeks to historicize the way we engage with the future. As part of the course, students also explore the role that methodology, models, causation and big data have played in predictive practices. The readings include a mixture of primary sources, modern scholarship and journalism.

Taught by: Kucuk
Course not offered every year
Activity: Seminar
1 Course Unit
STSC 329 Gender and Science
This course explores the gendered nature of science as social endeavor, intellectual construct and political resource. We consider the rise of gentlemanly science, masculinity and the arms race, the notion of a “Successor science” grounded in feminist theory, and the historical role of gender in defining who can do science and what counts as scientific data. We also explore how science has interpreted male-female differences. Our goal is to understand the profound impact of social place in the history of science, and thereby to understand the social nature of scientific knowledge.
Taught by: Lindee
Course not offered every year
Also Offered As: GSWS 330
Activity: Seminar
1 Course Unit

STSC 338 Hybrid Science: Nature, health, and society in Latin America
What role did science and medicine play in the creation and growth of the Spanish and Portuguese empires? And why was the creation of science and health institutions crucial to the revolutionary movements for independence in Latin America? This course examines science and medicine in Latin America by attending to the ways that knowledge of nature and health has been central to the political struggles of the countries in this region. A crucial dynamic shaping the history and culture of this region is the interplay between the healing practices and cosmologies of European settlers, indigenous Americans, and the descendants of African slaves. Bearing this interplay in mind, this course explores how Latin America has been a fertile site of scientific creativity. It also examines the ways in which Latin American scientists and medical experts have refashioned concepts and practices from Europe and North America to fit local circumstances.
Taught by: Gil-Riano
Course usually offered in spring term
Also Offered As: HSOC 338
Activity: Seminar
1 Course Unit

STSC 363 Technology & Democracy
What is the relationship between technology and politics in global democracies? This course explores various forms of technology, its artifacts and experts in relation to government and political decision-making. Does technology "rule" or "run" society, or should it? How do democratic societies balance the need for specialized technological expertise with rule by elected representatives? Topics will include: industrial revolutions, factory production and consumer society, technological utopias, the Cold War, state policy, colonial and post-colonial rule, and engineers' political visions.
Taught by: Voskuhl
Course not offered every year
Activity: Seminar
1 Course Unit

STSC 364 Technologies of Research: Digital Methods in Action
This course asks three questions: What is technology? What is research? And how does technology aid research? These three questions beg a fourth: how can we spend a semester on three questions? Well, the answers to each of these questions may seem apparent, but think about them for more than a few seconds and you'll be hard pressed to offer a satisfactory answer. The term technology conjures images of recent, micro-processors, robots, or the Internet. But think deeper about the terms meaning for a moment and you'll see that such ancient, elemental things as mathematics and the alphabet are technologies, too. Likewise, you'll find that something we have all done before research is an opaque and contestable term. The question of research gets at the very processes through which knowledge is produced.
Taught by: Wiggin
Course not offered every year
Also Offered As: HIST 305
Activity: Seminar
1 Course Unit

STSC 368 Sustainability & Utopianism
This seminar explores how the humanities can contribute to discussions of sustainability. We begin by investigating the contested term itself, paying close attention to critics and activists who deplore the very idea that we should try to sustain our, in their eyes, dystopian present, one marked by environmental catastrophe as well as by an assault on the educational ideals long embodied in the humanities. We then turn to classic humanist texts on utopia, beginning with More's fictive island of 1517. The "origins of environmentalism" lie in such depictions of island edens (Richard Grove), and our course proceeds to analyze classic utopian tests from American, English, and German literatures. Readings extend to utopian visions from Europe and America of the nineteenth and twentieth centuries, as well as literary and visual texts that deal with contemporary nuclear and flood catastrophes. Authors include: Bill McKibben, Jill Kerr Conway, Christopher Newfield, Thomas More, Francis Bacon, Karl Marx, Henry David Thoreau, Robert Owens, William Morris, Charlotte Perkins Gilman, Ayn Rand, Christa Wolf, and others.
Taught by: Wiggin
Course not offered every year
Also Offered As: GRMN 239
Activity: Seminar
1 Course Unit

STSC 379 Animals in Science Medicine Technology
This course explores human-animal relationships: the wide range of these relationships, why they originated and how they have changed over time. How have humans classified, valued, utilized, consumed, behaved toward and understood animals? Where is the boundary between humans and other animals, and how do we know, since humans are also animals? How is that boundary been maintained and redefined? Are humans part of the animal "natural" world- or apart from it? How are humans similar to and different from other kinds of animals? How do we know about animals and what is it we know? To what extent are questions about animals really questions about humans? How has the meaning of animal changed over time? The course focuses in particular to the roles and relationships of animals within science and medicine, and as biotechnologies.
Taught by: Greene, A
Course not offered every year
Also Offered As: GSWS 330
Activity: Seminar
1 Course Unit
STSC 388 Who Owns the Past
Stories told about the past have long been understood as moral lessons. And historical narratives have also been susceptible to different readings by opposed parties. But the strength of appeals to the past is not a constant: historical experience has at some times and in some places been seen as irrelevant to practical action. Today, in the United States as well as in many other parts of the world, appeals to historical precedent carry considerable weight, and are made for many purposes. For example, the dissolution of Yugoslavia, has been explained as a result of centuries-old ethnic tensions, yet when Yugoslavia was created at the end of World War I, objections were countered with the anthropological judgment that the new nation’s ethnic divisions were not really significant. Or consider the debate over the ownership of the bones of so-called "Kennewick Man," which pitted Native Americans against scientists over questions of identity and legal claims. Or, historical generalizations in biology over the value of Darwin's theory, resulting in political debates in local and school board elections and presidential contests. This course will discuss the uses of history in contemporary and past situations, drawing examples from the United States, Europe, the Middle East, and Africa. Course not offered every year Activity: Seminar 1 Course Unit

STSC 391 Bioethics and National Security
At least since Augustine proposed a theory of "just war," armed conflict has been recognized as raising ethical issues. These issues have intensified along with the power and sophistication of weapons of war, and especially with increasing engineering capabilities and basic knowledge of the physical world. The life sciences have had their place in these developments as well, perhaps most vividly with the revelations of horrific experiments conducted by the Nazi Imperial Japanese militaries, but with much greater intensity due to developments in fields like genetics, neuroscience and information science, and the widely recognized convergence of physics, chemistry, biology and engineering. The fields of bioethics and national security studies both developed in the decades following World War II. During the cold war little thought was given to the fact that many national security issues entail bioethical questions, but this intersection has been increasingly evident over the past two decades. In spite of the overlapping domains of bioethics and national security, there has been remarkable little systematic, institutional response to the challenges presented by these kinds of questions: - What rules should govern the conduct of human experiments when national security is threatened? - Is it permissible to study ways that viruses may be genetically modified in order to defeat available vaccines, even for defensive purposes? - What role may physicians or other health care professionals play in interrogation of suspected terrorists? - Must warfighters accept any and all drugs or devices that are believed to render them more fit for combat, including those that may alter cognition or personality? - What responsibilities does the scientific community have to anticipate possible "dual purpose" uses or other unintended consequences of its work? Deploying the resources of ethics, philosophy, history, sociology and theory, this course will address these and other problems. Taught by: Moreno Course usually offered in spring term Also Offered As: HSOC 391 Activity: Seminar 1 Course Unit

STSC 400 Undergraduate Seminar in Science Technology and Society
This is a capstone seminar for STSC majors, and a required seminar for any STSC junior who wishes to write a senior thesis for honors in the major. It is designed to provide the tools necessary to undertake original research by guiding students through the research and writing process. Students will produce either a polished proposal for a senior thesis project, or a completed research paper by the end of the term. Although each student will work on a different topic, the class will focus on general aspects of historical, and social scientific research and guide students through a close reading of key texts in science and technology studies. Course usually offered in spring term Activity: Seminar 1 Course Unit

STSC 408 Depicting Data and Picturing Nature
Scientific knowledge has always relied on images, as in the cases of big, beautiful books of pictures like Audubon’s Birds of America, photographs taken through telescopes, maps, readouts and today, digital images. These images can be a shorthand or guide to make patterns clearer or sometimes are taken to represent the natural world itself. With questions about how to represent "big data," the interpretation of medical images, and about the manipulability of digital images, the role of images in contemporary science is hardly straightforward. This course will look at the development of image-making as a part of knowledge production in medicine and the sciences. We will read works by visual specialists, historians, scientists and artists, and critically examine scientific images themselves, developing our own visual literacy. Taught by: Berkowtiz Course usually offered in spring term Activity: Seminar 1 Course Unit

STSC 411 Sports Science Medicine Technology
Why did Lance Armstrong get caught? Why do Kenyans win marathons? Does Gatorade really work? In this course, we won't answer these questions ourselves but will rely upon the methods of history, sociology, and anthropology to explore the world of the sport scientists who do. Sport scientists produce knowledge about how human bodies work and the intricacies of human performance. They bring elite (world-class) athletes to their laboratories or their labs to the athletes. Through readings, discussions, and original research, we will find out how these scientists determine the boundary between "natural" and "performance-enhanced;" work to conquer the problem of fatigue, and establish the limits and potential of human beings. Course themes include: technology in science and sport, the lab vs. the field, genetics and race, the politics of the body, and doping. Course goals include: 1) reading scientific and medical texts critically, and assessing their social, cultural, and political origins and ramifications; 2) pursuing an in-depth The course fulfills the Capstone requirement for the HSOC/STSC majors. Semester-long research projects will focus on "un-black-boxing" the metrics sport scientists and physicians use to categorize athletes' bodies as "normal" or "abnormal." For example, you may investigate the test(s) used to define whether an athlete is male or female, establish whether an athlete's blood is "too" oxygenated, or assess whether an athlete is "too" fast (false start). Requirements therefore include: weekly readings and participation in online and in-class discussions; sequenced research assignments; peer review; and a final 20+page original research paper and presentation. Taught by: Johnson Course not offered every year Also Offered As: HSOC 411 Activity: Seminar 1 Course Unit
STSC 413 Perfect Bodies
Taught by: Linker
One-term course offered either term
Also Offered As: HSOC 413
Activity: Seminar
1 Course Unit

STSC 426 Philosophy of Psychology
Is there a science of psychology distinct from physiology? If there is, what is its subject matter? What is the relationship between scientific psychology and traditional philosophical investigation of the mental? Examination of these questions is followed by analysis of some concepts employed in cognitive psychology and cognitive science, particularly in the fields of perception and cognition.
Taught by: Hatfield
Course not offered every year
Also Offered As: PHIL 426
Activity: Seminar
1 Course Unit

STSC 429 The Neurological Condition
Few aspects of our physical makeup are as closely linked to who we are as people as the nervous system. We define ourselves by our capacity to think, to react, by our memories. In large part, we believe we are our brains. Yet such perceptions have a history far deeper than our current neuro-obsessed moment. In this course we explore the neurological condition as the human condition: the growing sense since the nineteenth century that we are defined by our nervous systems, and the science that has fostered this vision. From theories of diminishing "nerve force" and the electric cures of the Victorian era, to fMRIs and Obama's 2013 BRAIN Initiative, we explore how science, medicine, and technology have shaped our understanding of the brain and nervous system as the center of human identity. Course topics include the rise of professional neurology and neuroscience, cultural meanings of nerves and the brain, and the intimate role of patients and human subjects in formulating this science from the nineteenth century to the present.
Taught by: Elder
Course usually offered in spring term
Also Offered As: HSOC 429
Activity: Seminar
1 Course Unit

STSC 436 Biopiracy: Medicinal Plants and Global Power
Biopiracy has emerged as the name of conflict between multinational pharmaceutical companies attempting to get genetic patents on medicinal plants and indigenous communities in the Global South who have long known and used these plants for medicinal purposes. Today the story of Biopiracy is an unfolding story of plants, patents and power. The extraction and commercial exploitation of plants and knowledge about them from the Global South however is not new. It has been happening at increasing pace for at least the last two centuries. Both the anti-malarial drug quinine and the cancer drug vincristine for instance have their plant-origins in the Global South where local communities used them medicinally long before their discovery by biomedicine. This course will put the current debates around Biopiracy in context and explore how the entanglements of plants and power have changed or not changed.
Taught by: Mukharji
Course not offered every year
Also Offered As: HSOC 436
Activity: Seminar
1 Course Unit

STSC 442 Hospital as Curing Machine
This course examines the technological, scientific, and spatial evolution of the modern hospital from the miasmatic, vermin-infested medieval European hospital-as-alms house, to the late twentieth-century ideal of the modern hospital as a condenser of sophisticated technologies, scientific expertise, and Taylorist efficiencies. In so doing, we will see how designers of hospital space, consciously or not, have striven to realize the mechanized, technological vision of the hospital as curing machine a phrase first invoked by 18th century French surgeon and anatomist Jacques Tenon. While the early nineteenth-century hospital had been a locus for fears about contagion, death, and disease in a pre-germ theory world, through its eventual integration of antiseptic practices, spatially produced zones of medical expertise (the operating suite, the laboratory, pediatric and maternity wards), novel technologies (incubators, hyperbaric chambers, x-rays, ultrasounds) and factory-like efficiencies the hospital came into its own as the epitome of rational modernist space. But, over the course of its evolution, the modern hospital also change as well: as an incubator for super-bugs, as an engine for projects of renewal, and as a site for the cultural transformation of the meaning of birth, death, and health itself.
Taught by: Greene, G
Course not offered every year
Also Offered As: HSOC 442
Activity: Seminar
1 Course Unit

STSC 443 Science and the Senses: Visual Culture, Material Objects
Using various types of readings, podcasts, and visits to area museums and centers of research, this course examines the relationships between seeing, sensing, and knowing in science. What roles do the senses and the material objects they observe play in production of science, and how has that changed historically? Are the senses reliable and standardizable, and if so, how can we talk about them with a common vocabulary? Are some more important than others? We will begin to answer those questions historically, following the role of the senses in science from the early modern period up to the present. We will look at ways in which vision was constructed as the primary sense during the Enlightenment and at ways in which it was made objective and instrumentalized in the modern period. We will also look at objects themselves. How do museum displays, illustrations jarred specimens, photographs, and movies make and convey knowledge.
Taught by: Berkowitz
Course not offered every year
Activity: Seminar
1 Course Unit
STSC 461 The Child in the City
This course examines the problem of the child in urban space in 19th and 20th century European and American discourses. This course does not propose to recover the subjective experience of the child but, rather, views the child as an object around which numerous adult anxieties connected to industrialization, urbanization, and modernity itself cohered. Discourses on public health, environmental pollution, sexuality, criminality, and racial degeneration all focused their attention, anxieties, and energies on how to deal with the unique vulnerability of the child in modern urban space. This interdisciplinary course focuses specifically on atmospheres, environments, and architectures in urban settings as diverse as Chicago, New York, Paris, and London. We will examine how the built environment was envisioned as part of a set of critical technologies for resolving the threat that urban space posed to the child. We will explore objects and envir as diverse as tenement babycages, wartime floating hospitals, open-air schools, adventu playgrounds in post-WWII London, car-less communities in Radburn, NJ, and American chil books about urban blight and renewal.
Taught by: Greene, G
Also Offered As: HSOC 461
Activity: Seminar
1 Course Unit

STSC 462 Technological & Business Innovation: Historical Perspectives
This course will explore the relationship between technological innovation and business history. By looking at a series of case studies of technologically driven firms – both U.S and international – we will develop a more sophisticated and historically informed model of the relationship between technological, economic, legal and political developments in the late 19th and 20th centuries. Course not offered every year
Activity: Seminar
1 Course Unit

STSC 471 Guns and Health
The purpose of this course is for students to gain an understanding of the role of guns in health, and population and prevention approaches to violence. The course will include a focus on policies and regulations related to firearms, the primary mechanism by which violence-related fatalities occur in the U.S. We will address the life span of a gun, from design and manufacture through to use. In addition, we will address key aspects of the social context in which firearms exist and within which firearm policy is made.
Taught by: Sorenson
Course usually offered in fall term
Also Offered As: HSOC 471
Activity: Seminar
1 Course Unit

STSC 498 Honors Thesis
Course usually offered in fall term
Activity: Independent Study
1 Course Unit

STSC 499 Undergraduate Independent Study
Available with all members of the department faculty subjects ranging from the history of anthropology to the sociology of institutions.
One-term course offered either term
Activity: Independent Study
1 Course Unit