

HISTORY OF SCIENCE (DIV II & III, see course descriptions)

Chair: Professor JOSEPH CRUZ

A major in the History of Science is not offered, but the occasional Contract Major in it or a related interdisciplinary field is possible. Courses in the History of Science are designed primarily to complement and strengthen work in other major fields. Although any of the courses may be taken separately, studying related courses in other departments will enhance their value, because by nature, History of Science is interdisciplinary.

The following will serve as examples: the 101 course is an introduction to science and technology studies, and concentrates on key aspects of contemporary science and technology relevant to many issues of living in a technological society. *Scientific Revolutions* (HSCI 224) deals with the emergence of modern science in the 1600s and 1700s, and with subsequent revolutions in scientific thought; as such it complements courses related to modern European history. History of Science 240 traces the influential role of science and invention in the shaping of American culture, and complements offerings in American Studies and American History. HSCI 320, an historical overview of the ideas, practice, and organization of medicine, provides context for related coursework in History, Philosophy, and the Premed and Public Health Programs.

Courses of Related Interest

PHIL 209 Philosophy of Science

SOC 368 Technology and Modern Society

HSCI 101(S) Science, Technology, and Human Values

Crosslistings: SCST 101/HSCI 101/SOC 201

This course offers an introduction to science and technology studies, or STS. A radically interdisciplinary field of inquiry, the roots of STS stretch through the philosophy, history, and sociology/anthropology of science and technology. Students will become acquainted with major STS schools, methodological strategies and research trajectories through intensive reading and analysis of classical and contemporary works in the field. Considerable attention will be devoted to exploring the nature of science and technology, their relationships to and interactions with one another, society and the natural world, and the influences these interactions exert in shaping what humans value. A fundamental goal of the course is to cultivate awareness and understanding of the social organization of technology and scientific knowledge production, and the technoscientific structuring of modern social life broadly. The course as such is aimed at attracting from all divisions those students who are intellectually adventurous and inclined to think critically about the place and prominence of science and technology in the modern world.

Class Format: seminar

Requirements/Evaluation: two or three short exercises, two papers (3-5 pages and 5-7 pages), and two hour exams

Prerequisites: none

Enrollment Preferences: first-years and sophomores

Enrollment Limit: 20-25

Expected Class Size: 20

Distributional Requirements:

Division 2

Spring 2017

SEM Section: 01 TR 08:30 AM 09:45 AM Instructor: Grant Shoffstall

HSCI 263 Cold War Technocultures

Crosslistings: SOC 263/AMST 263/HIST 363/HSCI 263/SCST 263

With the Soviet Union's collapse at the end of the twentieth century and the emergence of the United States as an unchallenged victor and "new world" hegemon, have we lost a sense of the drama, fear, and unbridled terror that permeated American life during the Cold War? In this course we will set out to understand Cold War American culture(s) by examining the intersection of politics, aesthetics, and a range of major technoscientific developments during this period. The course will take shape in three parts. Part I will explore the emergence and role of the computer in shaping the distinctly American style of thought aimed at Soviet "containment". We will furthermore trace historical trends connecting MIT's legendary Whirlwind computer, the SAGE continental air defense system, nuclear wargaming at the RAND Corporation, artificial intelligence, and the advanced technologies, management strategies, and atrocities of the Vietnam War. Part II takes up the symbolic potency of the space race, which we will use as a conduit through which to explore the following events and developments: Sputnik, Yuri Gagarin's spaceflight, the Apollo moon landing, and American civil defense; the postwar science of cybernetics and the emergence of the now iconic cyborg; the Club of Rome's *Limits to Growth* report and the Gaia hypothesis; plans backed by NASA for the industrialization, humanization, and colonization of outer space; and Ronald Reagan's Strategic Defense Initiative, "Star Wars". Finally, case studies considered in Part III will focus on moments of conflict and resistance, appropriation, and unintended consequences of the preceding and other Cold War technological developments, among them antipsychiatry and environmentalism; Project Cybersyn, an infrastructural causality of the US/CIA-backed Chilean coup of 1973; the American counterculture and the countercultural roots of neoliberalism(s).

Class Format: seminar

Requirements/Evaluation: weekly discussion precis, film screenings, class presentations, and a final research project decided in consultation with the instructor

Prerequisites: none

Enrollment Preferences: preference will be given to students with a demonstrated interest in the study of Cold War science and technology

Enrollment Limit: 19

Expected Class Size: 19

Distributional Requirements:

Division 2

Not Offered Academic Year 2017

SEM Instructor: Grant Shoffstall

HSCI 300 Measuring Truth**Crosslistings:** MATH 300/HSCI 300/REL 301/SOC 300

We will examine specific case studies of measuring truth—the emergence of science and technology in American colleges and universities; the prevalence of scientific methods in social science and humanities; the ways alternative methodologies in the humanities critique and historicize scientific approaches to reaching truth; and the possible tension between scientific modes of thinking and the aims of the liberal arts.

Class Format: seminar**Requirements/Evaluation:** five 2-page papers and a final 15-page paper**Extra Info:** may not be taken on a pass/fail basis**Prerequisites:** any 200-level course**Enrollment Preferences:** at the discretion of the instructors**Enrollment Limit:** 20**Expected Class Size:** 20**Distribution Notes:** meets Division 3 requirement if registration under MATH; meets division 2 if registration under AFR, HSCIREL or SOC**Distributional Requirements:**

Division 3

Other Attributes:

SCST Related Courses

*Not Offered Academic Year 2017***HSCI 309(F) Environmental Politics and Policy (W)****Crosslistings:** ENVI 309/HSCI 309/SCST 309/PSCI 301

This course will provide an overview of environmental policy-making, with an emphasis on the ways in which policies are developed and implemented at the local, state and national level. Special attention will be paid to the variety of actors that shape environmental outcomes, including legislators, administrators, the science community, civil society and the private sector. Following an examination of different models of environmental policy-making, this course will focus on several case studies, including on the management of public lands, air and water pollution, climate change and endangered species protection.

Class Format: seminar**Requirements/Evaluation:** evaluation is based on several shorter writing assignments, a semester-long research project, and participation**Prerequisites:** ENVI 101 or permission of instructor**Enrollment Preferences:** Environmental Policy & Environmental Science majors & Environmental Studies concentrators; but other students interested in public policy are welcome**Enrollment Limit:** 19**Expected Class Size:** 19**Dept. Notes:** required course for the Environmental Policy major and the Environmental Studies concentration**Distributional Requirements:**

Division 2

Writing Intensive

Other Attributes:

ENVI Environmental Policy

ENVP PTL Theory/Method Courses

ENVP PE-A Group Electives

ENVP PTL-A Group Electives

ENVP SC-A Group Electives

POEC Comparative POEC/Public Policy Courses

Fall 2016

SEM Section: 01 Cancelled Instructor: Pia Kohler

HSCI 336 Science, Pseudoscience, and the Two Cultures (W)**Crosslistings:** ASTR 336/HSCI 336

A famous dichotomy between the sciences and the humanities, and public understanding of them, was laid down by C. P. Snow and has been widely discussed, with ignorance of the second law of thermodynamics compared with ignorance of Shakespeare. In this seminar, we will consider several aspects of science and scientific culture, including how scientific thinking challenges the claims of pseudoscience. We will consider C. P. Snow and his critics as well as the ideas about the Copernican Revolution and other paradigms invented by Thomas Kuhn. We will discuss the recent "Science Wars" over the validity of scientific ideas. We will consider the fundamental originators of modern science, including Tycho, Kepler, Galileo, and Newton, viewing their original works in the Chapin Library of rare books and comparing their interests in science with what we now call pseudoscience, like alchemy. We will review the history and psychology of astrology and other pseudosciences. Building on the work of Martin Gardner in *Fads and Fallacies in the Name of Science*, and using the current journal *The Scientific Review of Alternative Medicine*, we consider from a scientific point of

view what is now called complementary or alternative medicine, including *both older versions such as chiropractic and newer nonscientific practices*. We will discuss the current global-climate-change deniers and their effects on policy. We consider such topics as GM (genetically modified) foods, the safety and regulation of dietary supplements, and the validity of government and other recommendations relevant to the roles of dietary salt and fat in health. We consider the search for extraterrestrial intelligence (SETI) and reports of UFO's and aliens. We consider the possible effects that superstitious beliefs have on the general public's cooperation in vaccination programs and other consequences of superstition. We also consider the recently increased range of dramas that are based on scientific themes, such as Tom Stoppard's *Arcadia* and Michael Frayn's *Copenhagen*.

Class Format: seminar

Requirements/Evaluation: evaluation will be based on biweekly 5-page papers, participation in discussions, and a 15-page final paper

Prerequisites: none

Enrollment Preferences: juniors and seniors and to those with backgrounds in science, history of science, or philosophy.

Enrollment Limit: 12

Expected Class Size: 12

Dept. Notes: non-major course; does not count toward ASPH, ASTR or PHYS major

Distribution Notes: meets Division 3 requirement if registration is under ASTR; meets Division 2 requirement if registration is under HSCI

Distributional Requirements:

Division 3

Writing Intensive

Other Attributes:

SCST Elective Courses

Not Offered Academic Year 2017

SEM Instructor: Jay Pasachoff

HSCI 340 Great Astronomers and Their Original Publications (W)

Crosslistings: ASTR 340/HSCI 340/LEAD 340

In the 2014-15 academic year of the study of the book, honoring the new library and the expansion of the Chapin Library of Rare Books, we study many of the greatest names in the history of astronomy, consider their biographies, assess their leadership roles in advancing science, and examine and handle their first-edition books and other publications. Our study includes the original books published as follows: 16th-century, Nicolaus Copernicus (heliocentric universe); Tycho Brahe (best pre-telescopic observations); 17th-century, Galileo (discoveries with his first astronomical telescope, 1610; sunspots, 1613; *Dialogo*, 1632), Johannes Kepler (laws of planetary motion, 1609, 1619), Johannes Hevelius and Elisabeth Hevelius (atlases of stars and of the Moon, 1647 and 1687), Isaac Newton (laws of universal gravitation and of motion, 1687); 18th-century, Edmond Halley (*Miscellanea curiosa*, eclipse maps, 1715, 1724); John Flamsteed and Margaret Flamsteed (*Atlas Coelestis*, 1729); William Herschel and Caroline Herschel (1781, 1798). In more recent centuries, the original works are articles: 20th-century: Albert Einstein (special relativity, 1905; general relativity, 1916); Marie Curie (radioactivity); Cecilia Payne-Gaposchkin (hydrogen dominating stars, 1929), Edwin Hubble (Hubble's law, 1929); Vera Rubin (dark matter, 1970s); Jocelyn Bell (pulsar discovery, 1968); 21st-century: Wendy Freedman (Universe's expansion rate, 2000s). We will also read biographies and recent novels dealing with some of the above astronomers. With the collaboration of the librarians, we will meet regularly in the Chapin Library of Rare Books and also have a session at the library of the Clark Art Institute to see its rare books of astronomical interest.

Class Format: seminar

Requirements/Evaluation: class participation, two 5-page intermediate papers, and a final 15-page paper

Enrollment Preferences: if over enrolled, preference by written paragraph of explanation of why student wants to take the course

Enrollment Limit: 15

Distribution Notes: meets Division 3 requirement if registration is under ASTR; meets Division 2 requirement if registration is under HSCI or LEAD

Distributional Requirements:

Division 3

Writing Intensive

Other Attributes:

SCST Related Courses

Not Offered Academic Year 2017

SEM Instructor: Jay Pasachoff

HSCI 371(S) Medicine, Technology, and Modern Power

Crosslistings: SOC 371/HSCI 371/SCST 371

Medicalization: those processes by which previously *non-medical* problems, once defined as ethical-religious, legal or social (e.g. drug and alcohol addiction, shyness, obesity), are brought within the purview of medical science and redefined as medical problems, usually in terms of "illness" or "disorder." Part I: The history of the medicalization thesis; medicalization as a technical process; modern medicine as a form of social control; critiques of the medicalization thesis. Part II: From medicalization to biomedicalization; from the management of human life to the transformation of "life itself" by way of post-World War II technoscientific interventions aimed at "optimizing" human vitality. Empirical cases for consideration will be drawn from those technoscientific developments having made possible the work of optimization that defines biomedicalization: molecular biology, pharmacogenomics, biotechnologies, imaging techniques, robotics, and transplant medicine, among others. Finally, a consideration of how processes of biomedical optimization have produced new ways of seeing, knowing, and imagining human bodies, such that biology is increasingly less representative of "destiny" than it is of possibility. The course will to this end conclude with a survey of emerging issues in speculative technoscience and the ethics and politics of human enhancement.

Class Format: lecture

Requirements/Evaluation: weekly discussion précis, science-fiction book review essay, class presentations, and a take-home midterm

Extra Info: may not be taken on a pass/fail basis

Prerequisites: none

Enrollment Preferences: preference will be given to Anthropology and Sociology students

Enrollment Limit: 25

Expected Class Size: 20-25

Distributional Requirements:

Division 2

Other Attributes:

PHLH Bioethics + Interpretations of Health

Spring 2017

LEC Section: 01 MWF 08:30 AM 09:45 AM Instructor: Grant Shoffstall

HSCI 497(F) Independent Study: History of Science

History of Science independent study.

Class Format: independent study

Distributional Requirements:

Division 2

Fall 2016

IND Section: 01 Cancelled

HSCI 498(S) Independent Study: History of Science

History of Science independent study.

Class Format: independent study

Distributional Requirements:

Division 2

Spring 2017

IND Section: 01 Cancelled