Science, Technology, and Society
Fall 2016 Courses for Credit

General Courses:
- ANTH 24 Anthropology of the Environment
- ANTH 130 History of Anthropological Thought
- COMP 150-02 Intro to Human-Robot Interaction
- ENVS 195 Environment, History, and Justice
- MUS 151 Music, Technology, & Digital Culture
- PHIL 118 Philosophy of Biology

Bodies, Health, and Medicine:
- ANTH 148 Medical Anthropology
- ANTH 188 Culture, Psychiatry, Politics of Madness
- CH 106 Health, Ethics, and Policy
- CH 107 Science and Practice of Medicine
- CLS 146/HIST 150 History of Ancient Medicine
- ENVS 9 Food Systems: From Farm to Table
- SOC/CH 108 Epidemics

Science and the State:
- CH 106 Health, Ethics, and Policy
- CH 107 Science and Practice of Medicine
- ENVS 9 Food Systems: From Farm to Table
- ENVS 135 Environmental Policy
- PS 138-10 Politics of Energy and Oil
- SOC/CH 108 Epidemics

Mathematics and Modeling:
- ANTH 136 Cultures of Computing
- CLS 91-02 Paradoxes and Dilemmas
- MATH 150-01 Mathematics of Poverty
- PHIL 38 Rational Choice
- PHIL 167 Science Before Newton’s Principia
- STS 10 Mathematical Modeling Reading Lab

Web: http://as.tufts.edu/sts/
Email: sts@tufts.edu
Study of the interactions between music, technology, and culture in popular, concert, and world music since WWI. Issues of production, distribution, and reception, involving such topics as the impact of radio on composition in the 1920s and 30s, recording the “aura,” skeumorphs, early synthesizers and the rise of electronic music, digital sampling, live looping and feedback loops, cassette culture, gender and technology, networked creativity, cyborgs and the posthuman. Open to grad students and advanced undergrads.
Anthropology as a discipline is uniquely concerned with its own history, and that history began, by most accounts, with an interest in kinship and classification. This course surveys the history of anthropological thought through these lenses, tracing the disciplinary relationships and changing categories through which anthropologists have made sense of the world since the late 19th century. By engaging writings, theories, and debates from across anthropology's history, we will try to understand how contemporary research interests fit into broader patterns of inquiry. We will treat anthropology as a knowledge-making project, which, since its inception, has been entangled with other knowledge-making projects, both among the people it has studied and in adjacent academic disciplines.
We will examine the conceptual foundations of evolution, ecology, and genetics, with special attention to outstanding philosophical problems. The course begins with Darwin, and his original presentation of natural selection in the Origin of Species. We will then look at two very different “big picture” views on evolutionary biology and the importance of natural selection, the first defended by Richard Dawkins and the second by Richard Lewontin. The course continues by discussing specific philosophical and theoretical controversies, such as those over the units of selection, the nature of fitness, biological functions, causation, biological individuals, and what natural selection explains.
Paradoxes and dilemmas are problematic cases, conundrums or puzzles that force us to accept counterintuitive conclusions from apparently acceptable premises or to choose among equally undesirable outcomes without an apparent justification. They are often associated with moments of crisis and revolutionary developments in the history of philosophy and beyond.

The course will introduce students to an array of famous cases in the history of Western thought from Antiquity to the present. Themes under discussion will include - but not be limited to - Zeno’s paradoxes (the infinite), the liar paradox (truth), the heap (vagueness), the ship of Theseus (identity), Russell’s paradox (sets), the Gettier problem (knowledge), moral luck, nuclear deterrence, the lottery paradox, the voting paradox and the prisoner’s dilemma.

The course indirectly provides an introduction to various fundamental themes in metaphysics, logic, epistemology and moral philosophy and offers analytical tools that can be useful for students in any area of the humanities, social sciences and international relations.
Ethical analysis has become an increasingly integral part of health policy and public health. A foundation in normative ethics and political philosophy is central to policy and medical decision-making because at the core of many policy and medical debates lie questions of distributive justice. This course will focus on evaluating how values, ethical approaches, and evidence should inform policy making, clinical medicine, and public health practice. How should scarce resources, such as organs for transplantation or hospital beds, be allocated? How much personal responsibility do people have and how accountable should they be for their own health and health behaviors? How should public health effectively balance equity and efficiency? Should medicine or public health be specifically concerned with the health of vulnerable or marginalized populations?
Decision making and strategic interaction are activities we engage in everyday. But do we make the right decisions? Do we adopt the most advantageous strategies? This course will approach these questions by using a set of formal methods for analyzing decisions and strategies: decision theory and game theory. We will cover the basic formal frameworks of probability and game theory and their application to problems in decision making and strategic thinking, tackling a number of troublesome paradoxes that emerge. We will also look at promising applications of game theory to understanding evolution in both biological and cultural domains.
This course is an introduction to anthropological approaches to illness, health, healing and the body, and their relationships to culture and power. We will ask how social and political forces impact – and are themselves shaped by – illness, disease and bodily experience, addressing such issues of concern to medical anthropologists as cross-cultural models of suffering and the body, ritual aspects of healing, the politics of health intervention, social impact of new technologies, and the cultures of the clinic. Throughout, we will be attuned to race, gender, and class, asking how they are meaningful in the ways people live and die, get sick and get well, care for others and are cared for. We ask, how are illness and wellness are shot through with moral concerns?
CLS 146 History of Ancient Medicine

Professor: Joanne Phillips
Time: MW 10:30-11:45
How it Counts:
- Core STS
- Bodies, Health, and Medicine

A course designed to survey the historical development of ancient Greek and Roman medicine with emphasis on methodology and sources, as well as to assess the influence of ancient medicine on the development of modern clinical medicine. Topics covered include ancient views and practices with regard to anatomy, physiology, surgery, pharmacology, the etiology of disease, and medical deontology.
This is the first part of a two-course sequence focusing on Newton’s Principia, the book that first showed the world how to do science in the modern sense of the term. In Philosophy 168 in the spring semester we will read the Principia itself. The revolution produced by the Principia is undoubtedly the most important single event in the history of science, ending controversies begun by the Copernican model of the planetary system and leading over the next 60 years to what we now call Newtonian mechanics. It produced no less of a revolution in scientific method by illustrating a way of marshaling evidence that stood in sharp contrast to both the narrow empiricist line then prevalent in England and the rationalist line prevalent on the continent. Because of this, the Principia is as important to philosophy of science as it is to history of science. It is the perfect work to focus on in investigating how science at its best succeeds in turning data into decisive evidence. In keeping with this, the question answered over the course of the two semesters is, How did we first come to have high quality evidence in any of the sciences?

The Principia is accessible to a wide range of students. It requires no background in physics or calculus. It does, however, require historical knowledge of the scientific context in which it was written. Thus, the goal of the fall semester is to cover the background needed to grasp the force of the evidential arguments in the Principia. We will review the work on planetary orbits by Kepler and those after him; Galileo’s efforts toward a science of motion; Descartes’ theory of planetary motion; and studies of curvilinear motion by Huygens and Newton that led directly into the Principia.
This course offers a mid-level survey of topics in the cultural analysis of computing. Where popular discourse around computing often takes it to be a universalizing force that “impacts” culture and society without being significantly influenced by them, we will take the opposite approach, investigating how computers embody cultural ideals and depend on social contexts. Areas of inquiry will range from the mines that provide the rare earth metals necessary for computers to function, to the culture of Silicon Valley workplaces, to global distributions of labor in chip manufacturing and new forms of "micro-work." In addition to ethnographic research on the contemporary variability of experiences with computers, we will attend to the historical development of computing as a cultural form, from its origins in gendered calculational labor to the mid-century emergence of cybernetics to the connections between counterculture and cyberculture. Through regular written responses, student-led discussions, and experimental exercises, students will learn how to examine the sociocultural aspects of computing in their everyday lives. Topics will also include the cultural life of algorithms and big data, the social analysis of mathematics, post-colonial computing, and social media.
This course will explore the history and evolution of some of the greatest challenges to human health. We consider the origins of epidemics, broadly defined, and the factors - rooted in biology, social relations, culture and political economy - that have shaped their course. We examine the interaction between societies' efforts to cope with disease and the implications of the latter for world history, ancient and contemporary. The course compares the explanations of historians and social scientists for why societies respond as they do to epidemics. Particular emphasis will be placed on the role of both medical knowledge and social relations in different societies and time periods.
In 2010, the top 388 billionaires had a combined wealth exceeding that of half the earth’s population. Today, that number is 62 and decreasing. The enormous concentration of wealth and the unchecked growth of inequality have emerged as crucial social issues of our time. To what extent can mathematics help shed light on this problem? We will begin with definitions of money, wealth and income; survey historical thought on this subject from mathematical, economic and philosophical perspectives; and discuss how wealth and inequality are quantified. This will lead us to study the theory of distributions and density functions, histograms and kernel estimation.

The centerpiece of this course will be an introduction to dynamical models, with particular emphasis on asset-exchange models. Along the way, we will learn about strong and weak forms of conservation laws, multi-agent distributions and density functions, the random-agent approximation leading to the Boltzmann equation, and the small-transaction approximation leading to the Fokker-Planck equation for the wealth distribution. We will study the phenomenology exhibited by these equations, including a phase transition discovered by Bouchaud and Mézard in 2000 called wealth condensation, which is thought to explain the origin of oligarchy.

Multivariable calculus is a prerequisite. Differential equations and linear algebra are helpful, but not necessary. No prior background in economics is assumed.
This course addresses the intersections of culture, power and mental illness by looking at experiences of suffering and its management, the history of psychiatry, and the relationship of social processes to understandings of disorder. We will take an inherently cross-cultural approach, looking not only at experiences in non-Western as well as Western settings, but also at varied histories and cultures of global biomedicine. We will consider medical categories culturally and historically, looking at the processes by which forms of experience are cast in languages of pathology, and we will also think about medical categories in the contexts of their use. At the same time that we are attentive to structures of care we will look at ways of managing distress beyond the clinic – in the context of religion, ritual, and everyday life. We will discuss spirit affliction and possession, “culture-bound syndromes,” and concepts of hysteria, as well as the history of the asylum, debates on global schizophrenia outcome, the relationship of trauma to national politics, and the pharmaceutical industry. Source material includes ethnographic and historical writing, clinical studies, fiction, film, and art. We will engage current anthropological theories that emerge from the study of mental illness, including social suffering, biosocialiality, political subjectivity, and postcolonial disorder.