

SCIENCE, TECHNOLOGY, AND SOCIETY (STS)

STS 47: Wilderness, Technology, and Society

3 Credits

Impact of developments in science, literature, and art on changing attitudes toward nature; consequences for conservation, preservation, environmental ethics.

Cross-listed with: SOC 47

Bachelor of Arts: Social and Behavioral Sciences

STS 55: Space Science and Technology

3 Credits

The science and technology of space exploration and exploitation; physical principles; research and development; history, space policy, and social implications.

Cross-listed with: AERSP 55

Bachelor of Arts: Natural Sciences

Bachelor of Arts: Social and Behavioral Sciences

General Education: Natural Sciences (GN)

STS 100: Science, Technology, and Culture

3 Credits

A survey of the development and culture of science, technology, and medicine in world history. S T S 100 Science, Technology, and Culture (3)(GH)(BA) This course meets the Bachelor of Arts degree requirements. "Science, Technology, and Culture" surveys the development and culture of science, technology, and medicine in world history. This course will introduce students to using the humanities, social sciences, and the arts to understand the development and uses of science, technology, and medicine in human history. The course focuses on broad trends and changes over time in their social and cultural contexts. The course is intended to address the needs of a wide range of students. For students majoring in the the arts, humanities and social sciences, the course provides a deeper understanding of the relationship between lay/popular and techno-scientific cultures. For the scientific and technically oriented student, the class exposes students to the study of technical and scientific problems from a broader cultural and historical perspective. All students will develop a knowledge of the values that have motivated and informed scientific, technological, and clinical ventures as well as an appreciation of important cultural dimensions of techno-scientific work, including the influence of religious concepts and practices, the impact of race, class, and gender, the significance of language and symbols, and the role played by local and global traditions. The course also asks students to think critically about the role of science, technology, and medicine in world history and the impact of that history on today's world. Topics include: the role of scientific and technical expertise in society; the social and economic conditions that have fostered and impeded scientific development and technological innovation; the social, aesthetic, and symbolic considerations that have shaped the way scientific ideas have been framed and used; and the impact of scientific notions and technological innovations on social life. Students are required to read both primary and secondary texts. Students are also

required to augment their classroom readings with scholarly material that they find through library and electronic research. In addition to regular classroom discussions, students will also participate in team-based learning activities and projects that require the students to interact with their peers and to present their thoughts publicly.

Bachelor of Arts: Humanities

General Education: Humanities (GH)

STS 100H: The Ascent of Humanity

3 Credits

A survey of some of the intellectual achievements that highlight humanity's attempts to understand nature and shape the environment.

Bachelor of Arts: Humanities

General Education: Humanities (GH)

Honors

STS 101: Modern Science, Technology, and Human values

3 Credits

Relationships of science and technology to human aspirations, values, and arts.

Bachelor of Arts: Humanities

General Education: Humanities (GH)

STS 105: Food Facts and Fads

3 Credits

This course is an introduction to the central role of food and food production in all areas of human life. The social and technological bases of various food systems are examined from the hunter-gatherer to the agrarian to the modern industrial system and its discontents. The course also considers how different types of food (e.g., meat, milk, cereals, chocolate) are preserved and distributed, examining both the effects of the development of the science and technology on society and vice versa. The roles of various food components (e.g., proteins, carbohydrates, fats, and vitamins) are examined both within the foods as determinants of quality, and also in terms of human nutrition and health. Finally, various other ways food may be considered appropriate or inappropriate will be studied including scientifically based reasons (e.g., safety, taste, adulteration) and non-scientifically based reasons (e.g., ethical, legal, religious).

Cross-listed with: FDSC 105

Bachelor of Arts: Social and Behavioral Sciences

General Education: Health and Wellness (GHW)

GenEd Learning Objective: Crit and Analytical Think

GenEd Learning Objective: Integrative Thinking

STS 110N: Chemistry in World Wars I and II

3 Credits

The study and assessment of chemical developments during the First and Second World Wars will form the backbone of this course. As the course is historically focused on the period from 1914 to 1945, the students will develop a basic understanding of the significant historical

events that led to the development of chemical innovations in materials, medicine, and weapons. To understand the scientific context of these developments, the students will also learn about the basics of chemistry, including recognizing the nature of the scientific process and discovery. In addition, the students will read, evaluate, and discuss primary and secondary sources to provide them with further insight into significant figures, events, and developments. These lectures, readings, and discussions (along with other assignments) will allow students to explore the ethical dimensions, the economic effects, the social consequences, and the public health impact that these scientific discoveries had on scientists, soldiers, and civilians. The students will also ascertain how many of the scientific discoveries made between 1914 and 1945 have had both beneficial applications and detrimental effects since 1945.

International Cultures (IL)

General Education: Humanities (GH)

General Education: Natural Sciences (GN)

General Education - Integrative: Interdomain

GenEd Learning Objective: Effective Communication

GenEd Learning Objective: Integrative Thinking

GenEd Learning Objective: Soc Resp and Ethic Reason

STS 122: History of Science I

3 Credits

A history of science and culture from Stonehenge to the scientific revolution. S T S (HIST) 122 History of Science I (3) (GH) (BA) This course meets the Bachelor of Arts degree requirements. The purpose of this course is to explore the earliest developments in science, beginning with the prehistoric roots of technology and theories of human origins, followed by an engagement with the achievements of the Mayans, Aztecs, and native North Americans. We then turn to science and technology in the ancient Greek and Egyptian worlds, followed by an analysis of early Chinese and East Indian science, medieval science in Europe, selected African sciences, and the rise of modern science in Scientific Revolution and beyond. The point of the course is to show that science is a world tradition with an ancient history, and that many social, political, cultural, and economic forces can push or pull this peculiar form of knowing in one direction rather than another. There are other history of science courses offered at Penn State, but none treats the history of science in general in relation to its social context and influences. Other history of science courses are more thematic than survey courses. HIST/ S T S 123, "History of Science II," treats science from the scientific revolution to the present. Students may take either course alone or out of sequence; the first will not be a prerequisite for the second. The expectation is that students will combine knowledge acquired in this course with knowledge from their required general education courses in science to develop a broader understanding of history and science. HIST/S T S 122 may be used to fulfill a requirement for the History major and the History minor and it is an essential part of the recently proposed science and technology history theme within the Science Technology & Society minor. Nonmajors may use it to fulfill a general education humanities requirement.

Bachelor of Arts: Humanities

General Education: Humanities (GH)

STS 123: History of Science II

3 Credits

A history of science and culture from the scientific revolution to the present. S T S (HIST) 123 History of Science II (3) (GH) (BA) This course meets the Bachelor of Arts degree requirements. The purpose of this course is to explore the earliest developments in science, beginning with the prehistoric roots of technology and theories of human origins, followed by an engagement with the achievements of the Mayans, Aztecs, and native North Americans. We then turn to science and technology in the ancient Greek Egyptian worlds, followed by an analysis of early Chinese and East Indian science, medieval science in Europe, selected African sciences, and the rise of modern science in the Scientific Revolution and beyond. The point of the course is to show that science is a world tradition with an ancient history, and that many social, political, cultural, and economic forces can push or pull this peculiar form of knowing in one direction rather than another. There are other history of science courses offered at Penn State, but none treats the history of science in general in relation to its social context and influences. Other history of science courses are more thematic than survey courses (e.g., "History of Mathematics" and "History of Gender in Science and Archaeoastronomy"). HIST 122, "History of Science I," treats science from Stonehenge to the scientific revolution. Students may take either course alone or out of sequence; the first will not be a prerequisite for the second. The expectation is that students will combine knowledge acquired in this course with knowledge from their required general education courses in science to develop a broader understanding of history and science. HIST/S T S 123 may be used to fulfill a requirement for the History major and the History minor and it is an essential part of the recently proposed science and technology history theme within the Science, Technology and Society minor. Students will learn historical techniques for the objective evaluation of readings and the formulation of clear and valid responses. Students' grades will be formed from a combination of a midterm and a final. Students are also required to do a paper for the class, the topic being subject to the approval of the instructor.

Bachelor of Arts: Humanities

General Education: Humanities (GH)

STS 124: History of Western Medicine

3 Credits

This course explores the history of health, illness, and medicine in western society from Ancient Egypt through the modern world. Relying on both primary and secondary sources, the course examines major developments in the understanding of health, illness, medical treatment, and medical practice in western society from Ancient Egypt to the present. The course will explore such themes as the changing status of medical practitioners, the experience of patients in different historical settings, artistic depictions of illness and healing, and the increasingly prominent role of medicine in public policy in order to better understand the links between medicine and its social, cultural, intellectual, and political contexts.

Cross-listed with: HIST 124

Bachelor of Arts: Humanities

International Cultures (IL)

General Education: Humanities (GH)

GenEd Learning Objective: Integrative Thinking

GenEd Learning Objective: Key Literacies

STS 135: The Politics of the Ecological Crisis

3 Credits

The political implications of the increasing scarcity of many of the world's resources. PL SC (S T S) 135 The Politics of the Ecological Crisis (3) (GS)(BA) This course meets the Bachelor of Arts degree requirements. "The Politics of Scarcity" examines some "big" questions about the prospects for humans in general and democracy in the United States in particular. Much of the reading assumes that our civilization faces the twin problems of increasingly serious shortages of resources and a growing ecological crisis that threatens the basis of life. Further, it argues that these "twin crises" feed upon each other, and that together they pose serious short and long run challenges to survival. Some readings attribute these problems to the dominant values that characterize modern Western society. The course does consider some dissents from this perspective, arguments that things will be just fine. However, it concentrates on problems and predictions of trouble. Thus, the class does not claim to present an evenly balanced assessment. Rather, it recognizes that most of what we learn, read, and see supports the status quo and assumes our civilization and energy-dependent way of life will continue. Consequently it makes sense to emphasize the less frequently argued position that we may be headed for disaster. The class aspires to appeal to students regardless of major or college – to scientists, engineers, students of the humanities, and even economists and political scientists. It fulfills the University-wide general education requirement in Social Science. Although it discusses the role of politics in general and the role of the American political system in particular in discussing the "twin crises," it mostly grapples with fundamental questions of value that underlie and guide the play of power in our political system and with how the massive changes now taking place globally both affect and are affected by politics.

Cross-listed with: PLSC 135
Bachelor of Arts: Social and Behavioral Sciences
General Education: Social and Behavioral Scien (GS)

STS 150: Out of the Fiery Furnace

3 Credits

A history of materials, energy and man, with emphasis on their interrelationships. For nontechnical students.

Cross-listed with: EMSC 150
Bachelor of Arts: Humanities
Bachelor of Arts: Natural Sciences
International Cultures (IL)
General Education: Natural Sciences (GN)

STS 151: Technology and Society in American History

3 Credits

Development of technology in America from colonial times; its reception and its influence on social, economic, and political life.

Cross-listed with: HIST 151
Bachelor of Arts: Social and Behavioral Sciences
United States Cultures (US)

General Education: Social and Behavioral Scien (GS)

STS 157: Science, Technology, and Gender

3 Credits

The role of women and gender in science, technology, and engineering. S T S (WMNST) 157 Science, Technology, and Gender (3) (GS;US)(BA) This course meets the Bachelor of Arts degree requirements. S T S/WMST 157 examines the role of gender in science, engineering, and technology. The course offers a broad interdisciplinary overview of scholarly research and theory pertaining to women and issues of gender in science, engineering, and technology. The course is interdisciplinary (drawing materials from the natural and social sciences) and cross-cultural (taking a comparative approach to western and non-western sciences and technologies), and it examines the ways that different beliefs and practices related to gender have shaped the practice of science in different times and places. Students study great women scientists and also barriers institutional and ideological - that women have had to overcome in order to participate in science, asking how the presence and absence of women have affected those studies. Students will be graded by several quizzes and two short exams during the semester. To evaluate progress in developing critical thinking skills, the students will be required to write a response journal and/or response papers to major topic areas during the semester. Also, one individual or group presentation will be required. These instruments enable the instructor to assess students' acquisition of knowledge relevant to the general objectives of General Education.

Cross-listed with: WMNST 157
Bachelor of Arts: Social and Behavioral Sciences
United States Cultures (US)

STS 197: Special Topics

1-9 Credits/Maximum of 9

Formal courses given infrequently to explore, in-depth, a comparatively narrow subject which may be topical or of special interest.

Bachelor of Arts: Social and Behavioral Sciences

STS 197F: Special Topics - InterDomain

3 Credits

Formal course given on a topical or special interest subject offered infrequently; several different topics may be taught in one year or semester. This Special Topics is an Inter-Domain GN/GS GenEd course.

General Education: Natural Sciences (GN)
General Education: Social and Behavioral Scien (GS)
General Education - Integrative: Interdomain

STS 200: Critical Issues in Science, Technology, and Society

3 Credits

An overview of interactions between science, technology, and society from social sciences and humanities perspectives.

Bachelor of Arts: Social and Behavioral Sciences
General Education: Social and Behavioral Scien (GS)

STS 200S: Critical Issues in Science, Technology, and Society

3 Credits

An overview of interactions between science, technology, and society from social sciences and humanities perspectives.

Bachelor of Arts: Social and Behavioral Sciences
 First-Year Seminar
 General Education: Social and Behavioral Scien (GS)

STS 201: Climate Change, Energy, and Biodiversity

3 Credits

Studies of global warming, energy options, and biodiversity; their interrelations as sciences and as societal issues.

Bachelor of Arts: Natural Sciences
 Bachelor of Arts: Social and Behavioral Sciences
 General Education: Natural Sciences (GN)

STS 233: Ethics and the Design of Technology

3 Credits

Ethics and individual and group decision-making in the design of technology including design projects and specific attention to institutional ethics. PHIL (S T S) 233 Ethics and The Design of Technology (3) (GH)(BA) This course meets the Bachelor of Arts degree requirements. Technology has been around nearly as long as humans have been around. Humans have always created artifacts and artificial environments to aid us in our survival and to help fulfill our needs and desires. Moreover, today technology is all pervasive, transforming and conditioning our social and political relations, our cultural understanding of ourselves, and our relationship with other animals and the natural environment. Yet not much thought has been expended upon the meaning of technology, particularly in its moral dimensions. This course takes several steps to correct this deficiency. Because technologies can have far reaching effects well beyond the domain of their immediate application, the role of designers is crucial in deciding whether we take an intelligent or unintelligent approach to technology. All technologies exist to serve one human need or another. Designers make important choices concerning the creation, development, and deployment of many if not most technological innovations. Consequently, the task of the designer is an ethical one. Our goal is twofold: First, we will try to broaden our moral imaginations by taking into account the wider ranging effects that technologies have in order to reveal the moral significance of design choices. Second, we will examine the process of design itself, particularly in the way that the design process is similar to ethical reasoning in general. It is hoped that by accomplishing these two tasks, we will be empowered as designers, customers, citizens, and future employers to make choices that better fulfill the moral task of technological innovation. Two means will be used to achieve our course goals. Much of the time will be spent thinking about and discussing the various impacts that particular technologies have upon the social, cultural, and political lives of human beings and upon the natural environment. To facilitate thoughtful discussion, we will read a number of authors, writing short papers in preparation for critical discussion in class. In this way we will be better prepared to discuss and think about the issues at hand by having had the chance to organize our thoughts in advance. The second means is aimed at putting our ideas into practice by working in teams on

several design projects. These design projects will require the integration of readings, discussion, and research and their synthesis to solve a design problem. Student teams will work cooperatively on these projects and make oral progress reports as well as final written and oral reports.

Cross-listed with: PHIL 233
 Bachelor of Arts: Humanities
 General Education: Humanities (GH)

STS 235: Science and Religion

3 Credits

This course investigates the relationship between science and religion in multiple cultures. S T S 235 Science and Religion (3) (GH)The purpose of this course, designed to fulfill general education requirements in the humanities (GH), is to encourage students to investigate the relationships between the disciplines of science and religion. While most of the emphasis of the course will be on the historical interaction between science and Western religion, we will also investigate science ("natural philosophy") in the Islamic, Hindu, and Eastern religious traditions. Students will read classic texts that discuss science and religion from scientists such as Newton and Darwin as well as from world Scriptures and contemporary positions of various influential scientists and religious scholars concerning views of the material world as it relates to the spiritual world. There will be no attempt to encourage students to accept a particular religious or secular viewpoint. Rather, the course will be successful if at its conclusion the student can articulate a personal viewpoint while appreciating the reasons others might have for holding alternative opinions. Students will develop an understanding of the arguments and the historical context in which they originated which lead to differing positions. Thus, individual students will be expected to demonstrate this understanding in a series of examinations scheduled throughout the semester, and in a final examination if required by the instructor. Discussion and debate are useful devices in the search for understanding. In order to facilitate such discussion, students will be required to make one presentation to the class on an assigned topic. This presentation will serve as the starting point for class exploration of the topic. To encourage active and collaborative learning, the student presentations may be group efforts, however, no group will consist of more than three students.

Prerequisite: completion of a basic composition course or the equivalent, S T S100 or S T S101 , or completion of 30 credits of coursework
 General Education: Humanities (GH)

STS 245: Globalization, Technology, and Ethics

3 Credits

An investigation of technology and ethics in the globalized world from contemporary, socio-cultural, and historical perspectives. S T S 245 Globalization, Technology, and Ethics (3) (GS;IL)The objective of Globalization, Technology, and Ethics is to prepare students (especially but not limited to engineering and business students) who are headed into the corporate or government world for the challenges and realities of working in a rapidly globalizing world. This course will encourage students to become leaders in a mobile and diverse transnational workplace and help them to become critical citizens of that world. Through team-centered projects and readings from the social sciences and humanities, students will broaden their understanding of engineering, technology, and culture and then be given an introduction to how one

makes ethical decisions about that world. The course is designed to provide skills, theories and experiences that will help them to be respectful, diplomatic and professional while being able to successfully work with technology in multiple cultures and contexts. Globalization, Technology, and Ethics will also address topics of critical international and economic importance by including discussion of the World Trade Organization, World Bank, and International Monetary Fund. Students will understand their relationship to global manufacturing and technology use, off-shoring, outsourcing, international debt financing, and restructuring of world economies based upon different models of globalism. In addition, the class will address issues of 'glocalization' and student's and citizens' role in the globalized world and the multiple interactions that shape our technological world today.

International Cultures (IL)
General Education: Social and Behavioral Scien (GS)

STS 407: Technology and Human Values

3 Credits

Interrelationships of twentieth-century technological change and human values. Emphasis on the social and ethical aspects of technological progress.

Prerequisite: 9 credits of philosophy, including PHIL 107 or 6 credits of philosophy at the 200 level
Cross-listed with: PHIL 407
Bachelor of Arts: Humanities

STS 408: Cultural Foundations of Communications

3 Credits

Examination of oral, scribal, print, industrial, and electronic cultures; analysis of impact of technology on communications and social structure. COMM 408 / STS 408 Cultural Foundations of Communications (3)(BA) This course meets the Bachelor of Arts degree requirements. COMM 408 / STS 408 traces the development of communications technologies and their impact on culture over the last 500 years. Students will examine how different tools for communicating changed the way people organized and made sense of their worlds. The course begins by looking at oral cultures and moves on to the scribal, print, industrial, electronic and post-industrial or postmodern cultures, studying the media developments that marked each of these eras. With each period and its corresponding technology students will examine how and why the new media altered not only the form of communication (the type of speech, form of writing and/or speed of information transfer), but also how such changes altered the content of knowledge (how people made sense of their lives and communities). Readings are drawn from a range of disciplinary perspectives on the issues, from history, sociology and anthropology, to philosophy, communication studies and cultural theory. The historical and theoretical knowledge provided by the course will give students a solid foundation for coming to terms with media trends in present-day society and for thinking through their possible epistemological, political and cultural impacts. The course is a communications elective for the Journalism and Telecommunications majors and the Media Studies minor.

Enforced Prerequisite at Enrollment: Select 3 credits from the following: COMM 100 or COMM 110 or COMM 118 or COMM 150 or COMM 180 or COMM 251 or COMM 320 or COMM 370
Cross-listed with: COMM 408

Bachelor of Arts: Social and Behavioral Sciences

STS 416: Race, Gender and Science

3 Credits

The class will focus on race and gender as products of science, and how societal values shape scientific activity.

Cross-listed with: AFAM 416
International Cultures (IL)
United States Cultures (US)

STS 420: Energy and Modern Society

3 Credits

Technology and economics of energy resources, production, and consumption; environmental factors, exhaustion, new technology.

Prerequisite: 3 credits in Sociology
Cross-listed with: EMSC 420, SOC 420
Bachelor of Arts: Social and Behavioral Sciences

STS 428: The Darwinian Revolution

3 Credits

The origins and implications of evolutionary theory.

Prerequisite: an introductory science course and a history course
Cross-listed with: HIST 428
Bachelor of Arts: Humanities
International Cultures (IL)

STS 430: Global Food Strategies: Problems and Prospects for Reducing World Hunger

3 Credits

Technological, social, and political solutions to providing basic food needs; food resources, population, and the environment; current issues. NUTR (S T S) 430 Global Food Strategies: Problems and Prospects for Reducing World Hunger (3) (IL)(BA) This course meets the Bachelor of Arts degree requirements. Global Food Strategies examines opportunities for the world's poor to improve their health, nutrition, and physical environment by focusing on their own cultural strengths and organization, reassessing the opportunities within their environment, evaluating the appropriateness of new and old technologies, and gaining a renewed respect for their own abilities. Measures of appropriateness used throughout the course are ecological sustainability and cultural sensitivity. Approximately one third of the course focuses on the historical basis of underdevelopment up to and including the post-modern era. Topics include economic colonization, the industrialization of agriculture, the impacts of globalization, trade priorities and debt loads on the poor, population and ecological issues; and a critique of the economics of scarcity. The second two thirds focuses on micro-strategies for poverty alleviation. Topics include culturally-appropriate people centered development women's empowerment needs including microlending (small loans), the prospects and rationales for biological agriculture vs. industrialized agriculture, successful models of health and population control, the impact of American consumerism, and ecological footprint analysis. The goals of the course are to 1) awaken the student's interest in hunger and poverty issues and the cultural dimensions of poverty, 2) acquaint the student with viable and sustainable strategies for hunger and poverty alleviation for the very poor, and 3) enable the

student to understand enough about globalism that he/she can critically analyze and evaluate international affairs articles in national newspapers. The classes integrate lecture information with films that help with the visualization of poverty problems and prospects, readings, current events, and small group discussion around issues and case studies. Readings are drawn from development classics and from a wide range of recent literature on poverty and change. Evaluation includes student responses to three essay tests posed by the instructor over the semester, and journal keeping. The class project is designed to promote citizenship/ leadership skills. Students will make a contract to perform a particular citizen action relating to hunger and poverty alleviation, which they will describe in an oral report and written format. Participation is evaluated. The class is offered fall semester only. Enrollment is limited to 60 students.

Cross-listed with: NUTR 430
Bachelor of Arts: Social and Behavioral Sciences
International Cultures (IL)

STS 432: Medical and Health Care Ethics

3 Credits

Examines ethical, political, and social issues in the research, implementation, and practice of medicine, medical technologies, and healthcare.

Prerequisite: fifth-semester standing
Cross-listed with: PHIL 432
Bachelor of Arts: Humanities

STS 433: Ethics in Science and Engineering

3 Credits

Ethical issues arising in the practice of science and engineering and their philosophical analysis.

Cross-listed with: PHIL 433
Bachelor of Arts: Humanities
Bachelor of Arts: Social and Behavioral Sciences

STS 435: The Interrelation of Science, Philosophy, and Religion

3 Credits

The historical and transformative interactions between science and Western philosophical and religious views of nature, humanity, and God.

Cross-listed with: PHIL 435
Bachelor of Arts: Humanities

STS 460: Science, Technology, and Public Policy

3 Credits

The all-pervasive importance of science and technology policy in modern societies and mechanisms and processes by which it is made.

Prerequisite: 3 credits in natural sciences or engineering, 3 credits in social and behavioral sciences
Cross-listed with: PLSC 460
Bachelor of Arts: Social and Behavioral Sciences

STS 470: Technology Assessment and Transfer

3 Credits

Nature of technology assessment and technology transfer in product design and development process from federal and university labs, and internationally.

Bachelor of Arts: Social and Behavioral Sciences