SCIENCE, TECHNOLOGY, AND SOCIETY

Director, Assistant Professor Aaron Hanlon (English)

Advisory Committee: Professors Daniel Cohen (Philosophy), James Fleming (Science, Technology, and Society), Fernando Gouvêa (Mathematics and Statistics), Neil Gross (Sociology), Russell Johnson (Biology), Paul Josephson (History), Tanya Sheehan (Art), Dale Skrien (Computer Science), Judy Stone (Biology), and Dasan Thamattoor (Chemistry); Associate Professors Chandra Bhimull (Anthropology and African-American Studies), Melissa Glenn (Psychology), Jonathan Hallstrom (Music), Keith Peterson (Philosophy), Gianluca Rizzo (Italian Studies), Elizabeth Sagaser (English), Laura Saltz (American Studies), and Andrea Tilden (Biology); Assistant Professors Alicia E. Ellis (German) and Aaron Hanlon (English); Visiting Assistant Professor Lijing Jiang (Science, Technology, and Society); Faculty Librarian Kara Kugelmeyer (Library)

Science, Technology, and Society (STS) is an exciting interdisciplinary field of study grounded in the history, philosophy, anthropology, and sociology, and literature of science and technology. It examines deep cultural roots of our techno-scientific society and addresses pressing public policy issues. It provides a fundamental liberal arts education that spans the divisions of knowledge and is excellent preparation for graduate study or future employment opportunities in public service and the private sector.

Science and technology have become increasingly important components of our world, changing the ways we live, work, and think. The well-being of individuals, nations, and ultimately our Earth depends in part on technoscientific developments that are part of the process shaping both the social fabric and the natural environment, both in America and globally.

Following an introductory core course, students in the STS Program choose from a variety of electives and complete a yearlong senior research project. By doing so they gain an understanding of the historical and social dimensions of science and technology, become better-informed citizens of our high-tech society, and hone critical and valuable interdisciplinary skills involving writing, speaking, and creative thinking. Students pursuing a major or minor in STS require no special technical expertise.

Requirements for the Major in Science, Technology, and Society

The STS major has a core curriculum based on the research and teaching interests of the faculty. All courses are either U.S. or internationally focused and either science or technology-focused. Majors must complete a total of 11 courses: four required courses; four ST courses or cross-listed courses designated I, U, S, and T; and three electives chosen from the list of STS-approved courses below. Courses taken abroad or otherwise not on this list require the approval of the STS Program director.

- **Required:** ST112: Introduction to STS or ST114: Introduction to Medicine and Society or ST120A: Information Before and After Google
- **Required:** ST485: Technology Matters (required)
- **Required:** ST486: Senior Project: The Craft of Research (required) or ST484 Honors or ST492
- **Required:** One 200-level or higher course in natural science or computer science beyond the all-College requirement
- One STS internationally focused course (designated I)
- One STS U.S.-focused course (designated U)
- One STS science-focused course (designated S)
- One STS technology-focused course (designated T)
- Three approved STS electives

Electives may be chosen from the list of STS-approved courses to fulfill the I, U, S, and T foci, but a course that satisfies two or more foci may not be counted twice. A student may not count more than two 100-level electives toward the major.

Senior Projects

All senior STS majors will take ST485, which will prepare them for research through seminar readings, literature reviews, and proposal writing. This is the first part of a yearlong capstone experience in which students design and complete a final integrative project in science, technology, and society. This is followed by ST486, an intensive research and writing experience with final public presentations. Any member of the faculty may serve as an advisor for STS senior projects.

Honors in Science, Technology, and Society

Students with a 3.5 GPA in the major (and at least a 3.25 GPA overall) may request permission to undertake an honors thesis. They will enroll in ST485 and meet with other STS seniors to prepare a literature review and proposal, which must be approved by a panel of faculty members. Students continuing in the honors program will enroll in ST484 under the supervision of an advisor and second reader. Upon successful completion of the thesis and fulfillment of all requirements for the major, and if a 3.5 GPA in the major is maintained, the student will be invited to deposit a copy of his or her thesis in Miller Library and will graduate with “Honors in Science, Technology, and Society.”

Requirements for the Minor in Science, Technology, and Society

Track 1. Social-Cultural (for majors in humanities, interdisciplinary studies, and social science): Science, Technology, and Society
112 or 114, 485, three other STS courses, and at least two courses from the list of STS-approved courses.

or

Track 2. Human Dimensions of Science (for natural science majors): Science, Technology, and Society 112 or 114, 485, and three other STS courses; a two-course thematic cluster consisting of at least one 300-level or higher natural science, computer science, or mathematics course. The thematic cluster must be approved in advance by the STS Program in consultation with the relevant department(s). The final paper in 485 must integrate the thematic cluster with its human (social and cultural) implications.

List of STS-Approved Courses

* Key: International = I; U.S. = U; Science = S; Technology = T

American Studies
- 228 Nature and the Built Environment, U, T
- 254 Surveillance Culture, U, T

Anthropology
- 112 Cultural Anthropology I
- 256 Land, Food, Culture, and Power I
- 341 Culture, Mobility, Identity I

Art
- 244 Moving Images U, T
- 252 Medicine and Visual Culture U, S
- 285 History of Photography I, T
- 454 Picturing Nature: American Art and Science U, S

Biochemistry
- 362 Medical Biochemistry S

Biology
- 133 Microorganisms and Society U, S
- 164 Evolution and Diversity S
- 198 Biochemistry of Food S
- 259 Plants of the Tropics I, S
- 271 Introduction to Ecology S
- 274 Neurobiology S
- 275 Human Physiology S

Chemistry
- 217 Environmental Chemistry S

Computer Science
- 151, 152, or 153 Computational Thinking: T
- 232 Computer Organization T

East Asian Studies
- 242 Development, Environment, China I, S, T

Economics
- 231 Environmental and Natural Resource Economics U
- 341 Natural Resource Economics U, S

English
- 120N Language, Thought, Writing Medical Ethics
- 233 Enlightenment Data and Literature I, S
- 247 Science Fictions I, U, S, T
- 248 History of the Book T
- 262 Poetry of Revolution I
- 283 Environmental Humanities U
- 337 Climate Fiction U
- 363 The Enlightenment and the Anthropocene I, S, T
• 398 Life in Times of Extinction
• 3xx Energy and Utopia I, T

**Environmental Studies**
• 118 Environment and Society U
• 234 International Environmental Policy I
• 239 Seafood Forensics U, T
• 265 Global Public Health I
• 319 Conservation Biology S
• 366 Environment and Human Health I, T
• 3XX Scientific Communication S
• 494 Problems in Environmental Science S

**German**
• 263 Weird Fictions I

**History**
• 149 Modern Utopias I, U
• 245 Science, Race, and Gender S
• 246 Luddite Rantings: A Historical Critique of Big Technology U, I, T
• 248 Nuclear Visions, Environmental Realities I, U, T
• 330 Global Histories of Food I
• 348 U.S. Environmental History U, S, T

**Mathematics**
• 376 History of Mathematics I, S

**Music**
• 213 Intro to Computer Music S, T

**Philosophy**
• 126 Philosophy and the Environment U, S
• 213 Philosophical Inquiries into Race I, S
• 216 Philosophy of Nature I, S
• 217 Feminism and Science S
• 317 Philosophy of Science S
• 328 Radical Ecologies S

**Psychology**
• 233 Biological Basis of Behavior S

**Science, Technology, and Society**
• 112 Science, Technology, and Society (required)
• 114 Introduction to Medicine and Society I, U, S, T
• 117 Information Use and Misuse: Big Data in America U, T
• 120A Information Before and After Google U, T
• 132 Arts and Humanities annual theme lectures (1 credit, repeatable)
• 215 Weather, Climate, and Society I, U, S, T
• 223 Asian Science and Society I, S
• 234 Big History, I, U, S, T
• 235 Digital Projects in Environmental History I, U, S, T
• 237 History of Biology I, U, S
• 297 Global Food Health and Society I, T
• 484 Honors in STS
• 485 Technology Matters (required)
• 486 Senior Project: The Craft of Research (required)
• 491/492 Independent Study
• Approved JanPlans in STS

**Sociology**
• 131 Introduction to Sociology U
• 247 Universal Health Care: Could It Work Here? I, U
Course Offerings

ST112f  Science, Technology, and Society  Critical perspectives on the social aspects of science and technology in our lives, in the world around us, and throughout history. Issues include gender, communications, war, and the environment.  Four credit hours.  S. JIANG


ST114s  Introduction to Medicine and Society  A journey from Hippocratic medicine to 23andMe, examining different views of health, disease, and intervention and how diverse forms of medicine have emerged and evolved. Highlights the role of science and technology in establishing and maintaining certain views, institutions, and practices. Lectures, discussions, and readings will empower students to identify and analyze the multifarious factors involved in diagnosis, treatment, prevention, and biomedical ethics and the roles of scientific understanding, technological innovation, professionalization, and commercialization. Special topics include medicine and world views, chemical drugs and industrial revolution, human experimentation, and research ethics.  Four credit hours.  H. JIANG

[ST117]  Information Use and Misuse: Big Data and Artificial Intelligence  How has and is Big Data and Artificial Intelligence changing the ways that governments and businesses utilize our personal, geographic, and behavioral data; and what impact are these technologies having on our society. Case studies (technology, law, government, ethics and business) help students understand how the technologies are used and critically explore what ways are they shaping our society. Discussion based. Students develop critical thinking and writing skills and an understanding of the policies, terminologies, and concepts needed to successfully examine case studies.  Three credit hours.

ST120As  Information Before and After Google: Impacts and Technologies  Explores the nature of information and how technology has changed our experience and understanding of it over the past 75 years. Emphasizes the relationship between information and technology and explores the impact of information technologies on societies, organizations, and people. Participants explore how people understand and evaluate information and in what contexts information is valued and why. Students will develop and improve their understanding, critical thought processes, and analytic skills around a range of information technologies. Class format is discussion based, and the focus is on developing scholarly writing skills.  Four credit hours.  W1. KUGELMEYER

ST120Af  Language, Thought, and Writing: Critical Inquiries in Medical Ethics  Listed as English 120N.  Four credit hours.  W1. SIBARA

ST213s  Introduction to Computer Music  Listed as Music 213.  Four credit hours.  A. HALLSTROM

[ST215]  Weather, Climate, and Society  A scientific introduction to the Earth's atmosphere and historical and social issues related to weather and climate. Topics include the atmosphere's composition, structure, and dynamics; air pollution; ozone depletion; natural disasters; and climate change. Includes lectures, an exam, quizzes, short essays, and a group project to be presented in a final poster session.  Four credit hours.  N.

[ST216]  Philosophy of Nature  Listed as Philosophy 216.  Four credit hours.

[ST217]  Feminism and Science  Listed as Philosophy 217.  Four credit hours.  S, U.

[ST223]  Asian Science and Society  What knowledge traditions have taken shape in Asia? How have they differed from European traditions and why? How have they fared in encounters with the Western world and continued to shape the contemporary world? This course addresses these questions with cases from astronomy, medicine, and other nature studies in China, India, and Japan. It introduces concepts and frameworks of selected non-Western knowledge systems such as Chinese and Ayurvedic medicine, guiding students to explore the ways religions, politics, cultures, and cross-cultural encounters impacted these systems, their evolutions or replacements. Activities include lectures, discussions, research seminars, and field trips.  Four credit hours.

ST233fs  Biological Basis of Behavior  Listed as Psychology 233.  Four credit hours.  GLENN, HUFFMAN

ST233Jj  Enlightenment Data and Literature  Listed as English 233J.  Three credit hours.  L. HANLON
Big History: Critique and Counterproposal  Big History tells the story of the universe from the Big Bang to the present. This seminar course involves close reading and discussion of Big History from the perspectives of history of science and world history. Students will research what universal macro-histories might look like that are based on the scientific assumptions of earlier eras and other world cultures. We will also evaluate some of the (mainly pedagogical) strengths of Big History as promoted by its supporters.  Four credit hours.

Digital Projects in History  A project-based seminar introducing best digital practices in historical research. Sessions will include readings, discussions, visiting experts, site visits, and consultations with advanced practitioners. Students will undertake digital projects of their own design, either in groups or individually and will communicate their results in a public forum.  Four credit hours.  H.

History of Biology  Examines the emergence and development of life sciences since the 1700s by introducing major ideas, approaches, and debates regarding life, along with the discipline's material, cultural underpinnings and social impacts. Topics include natural history, classification, morphology, cell theory, physiology, evolution, genetics and eugenics, molecular biology, biomedicine, and biotechnology. Series of lectures will survey the development of biology in Western Europe and the United States, supplemented with materials from non-Western contexts. One question we ask throughout the course is how social and cultural contexts have shaped certain views of life.  Four credit hours.  N. JIANG

Making Modern Science  Listed as American Studies 238.  Four credit hours.  H. I. SALTZ

Seafood Forensics: Uncovering Fraud in Ocean Food Systems  Listed as Environmental Studies 239.  Four credit hours.  RASHER

Development and Environmental Issues in Contemporary China  Listed as East Asian Studies 242.  Four credit hours.  S, I. ZHANG

Moving Images: Magic Lanterns to Virtual Reality  Listed as Art 244.  Four credit hours.  A.

Science, Race, and Gender  Listed as History 245.  Four credit hours.  N, U. JOSEPHSON

Luddite Rantings: A Historical Critique of Big Technology  Listed as History 246.  Four credit hours.  H, U.

Nuclear Visions, Environmental Realities  Listed as History 248.  Four credit hours.  H, I.

History of the Book  Listed as English 248.  Four credit hours.

Life Sciences and Society  Listed as Sociology 249.  Four credit hours.  S.

Medicine and Visual Culture  Listed as Art 252.  Four credit hours.  A.

Surveillance Culture  Listed as American Studies 254.  Four credit hours.  U.

Science Fictions  Listed as English 247.  Four credit hours.  L.

Plants of the Tropics  Listed as Biology 259.  Three credit hours.

Weird Fictions (in English)  Listed as German 263.  Four credit hours.  L.

Environmental Humanities: Stories of Crisis and Resilience  Listed as English 283.  Four credit hours.  L. WALKER

History of Photography  Listed as Art 285.  Four credit hours.  A. HICKEY

Philosophy of Technology  What is technology? How do technologies matter for societies? What are their promises and risks for human and social values such as liberation, self-determination, social order, well-being, and justice? In what ways are technologies and their uses manifestations of desire or fear; human nature or local cultures; idealistic vision or struggles for power? In this course we critically review answers to these questions from Aristotle, Marx, Heidegger, Latour, and others and apply their concepts and methods to case
studies in contemporary technology such as AI, big data, surveillance, geoengineering, social media, human enhancement, resource management, and domestic labor-saving devices.  

**ST298s**  Philosophy of Biology  Listed as Philosophy 298.  Four credit hours.  HONENBERGER

**[ST317]**  Philosophy of Science  Listed as Philosophy 317.  Four credit hours.

**[ST328]**  Radical Ecologies  Listed as Philosophy 328.  Four credit hours.

**ST337s**  Climate Fiction  Listed as English 337.  Four credit hours.  L. WALKER

**[ST341]**  Culture, Mobility, Identity: Encounters in the African Diaspora  Listed as Anthropology 341.  Four credit hours.  S, I.

**[ST361]**  Special Topics in Health and Medicine: Substance Use and Abuse  Listed as Sociology 361.  Three credit hours.

**[ST363]**  The Enlightenment and the Anthropocene  Listed as English 363.  Four credit hours.  L.

**ST370f**  Literature and Medicine: Voices from the Margins  Listed as English 370.  Four credit hours.  L, U. SIBARA

**ST376f**  History of Mathematics  Listed as Mathematics 376.  Four credit hours.  H. GOUVEA

**ST397f**  The Great Plague, 1347-1351  Listed as History 397B.  Four credit hours.  H. TAYLOR

**[ST454]**  Picturing Nature: American Art and Science  Listed as Art 454.  Four credit hours.

**ST484s**  Honors in Science, Technology, and Society  Majors may apply for admission in December of their senior year by preparing and defending an honors proposal. The honors program requires focused research conducted under the guidance of a faculty member, leading to the writing of a thesis approved by the advisor and a second reader.  Prerequisite:  Senior standing, a 3.50 grade point average in the major, a 3.25 overall grade point average, successful completion of Science, Technology, and Society 485, and permission of the program faculty.  Four credit hours.  FACULTY

**ST485f**  Technology Matters  Seminar emphasizing classical, enduring issues involving the social study of science and technology. A senior capstone in preparation for a career. Students design, propose, and initiate a year-long project through broad reading, seminar discussions, written think pieces, a book review, thorough literature search, and preparation of a proposal and exploratory essay. Completion, typically in the spring but including a possible January internship, requires intensive research, writing, and presentation at a public seminar. Research funding may be available. Goal is to complete a project the student finds exciting and challenging and that will solidify her/his ability to conduct interdisciplinary research.  Prerequisite:  Senior standing and a W1 course.  Four credit hours.  W3. JIANG

**ST486s**  Senior Project: The Craft of Research  Written and oral communication of research. Students complete a final integrative project and present three public seminars.  Prerequisite:  Science, Technology, and Society 485.  Four credit hours.  JIANG

**ST491f, 492s**  Independent Study  Independent study in areas in which the student has demonstrated the interest and competence necessary for independent work.  Prerequisite:  Permission of the instructor and the program director.  One to four credit hours.  FACULTY