SCIENCE, TECHNOLOGY, AND SOCIETY

Director, *Professor James Fleming*

Program Faculty and Staff: Professor James Fleming, Postdoctoral Fellow Lijing Jiang

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), 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), Elizabeth Sagaser (English), Laura Saltz (American Studies), Tanya Sheehan (Art), and Andrea Tilden (Biology); Assistant Professors Alicia Ellis (German), Serena Ferrando (French and Italian), Aaron Hanlon (English), and Gianluca Rizzo (French and Italian); Postdoctoral Fellow Lijing Jiang (Science, Technology, and Society); Faculty Members without Rank Kara Kugelmeyer (Library), and Elizabeth Finch (Museum of Art)*

Science, Technology, and Society (STS) is an exciting interdisciplinary field of study grounded in the history, philosophy, anthropology, and sociology of science and technology. It examines deep cultural roots of our technoscientific society and addresses pressing public policy issues. It constitutes a fundamental aspect of a liberal arts education and is excellent preparation for graduate study or future employment opportunities.

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 take three required courses and choose a minimum of eight electives 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.

- ST112: Introduction to STS (required) or ST114: Introduction to Medicine and Society
- ST485: Technology Matters (required)
- ST486: Senior Project: The Craft of Research or ST484 Honors (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 are 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. In choosing the eight electives, students must take a minimum of three courses designated or cross-listed as ST. 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: 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: 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

Anthropology

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

Art

- 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

Economics

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

English

- 233 Data and Literature in the Scientific Revolution I, S
- 247 Science Fictions I,U,S,T
- 262 Poetry of Revolution I
- 283 Environmental Humanities U
- 398 Life in Times of Extinction

Environmental Studies

- 118 Environment and Society U
- 234 International Environmental Policy I
- 265 Global Public Health I
- 319 Conservation Biology S
- 366 Environment and Human Health I, T
- 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

Mathematics

- 376 History of Mathematics I, S

Philosophy

- 126 Philosophy and the Environment U, S
- 213 Philosophical Inquiries into Race 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
- 215 Weather, Climate, and Society I, U, S, T
- 235 Digital Projects in Environmental History I, U, S, T
- 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

Sociology

- 131 Introduction to Sociology U
- 247 Universal Health Care: Could It Work Here? I, U
- 249 Life Sciences and Society U, S

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

ST115s   English Composition: Critical Inquiries into Medical Ethics Listed as English 115C.   *Four credit hours.*   **W1.**   SIBARA

ST117j   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. Previously listed as GO118 (Jan Plan 2016). *Three credit hours.* KUGELMEYER

[ST120] **Cognitive Science of Religion** Religion is deeply puzzling from the perspective of evolutionary biology. The practice of religion takes time and energy, and yet it does not have any clear adaptive benefits: evolutionarily, gathering food is more rewarding than kneeling in prayer. So, how did religion become a universal if it is so costly? We explore both the psychology of religion and recent attempts to understand its evolutionary history. *Four credit hours.* **S, W1.**

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

ST132s **The Presence of the Past** How does the past shape our contemporary moment? How does the present inform what we know and feel about the past? To address these questions, this course will explore how our relation to the past is shaped by politics, art, science, and culture. Students will attend public lectures by visiting scholars and Colby faculty. These lectures will examine the political stakes of negotiating between the past and present from a range of disciplinary perspectives. Students will engage in focused discussion and short reflection papers. Nongraded. **The Presence of the Past humanities theme course.** *One credit hour.* COOK, JIANG, WALKER, VAN DER MEER

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

ST215f **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.** FLEMING

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

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

ST233s **Biological Basis of Behavior** Listed as Psychology 233. *Four credit hours.* GLENN

ST235s **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.** FLEMING

ST244s **Moving Images: Magic Lanterns to Virtual Reality** Listed as Art 244. *Four credit hours.* **A.** SPERLING

ST245f **Science, Race, and Gender** Listed as History 245. *Four credit hours.* **N, U.** JOSEPHSON

ST246s **Luddite Rantings: A Historical Critique of Big Technology** Listed as History 246. *Four credit hours.* **H, U.** JOSEPHSON

[ST247] **Universal Health Care: Could It Work Here?** Listed as Sociology 247. *Four credit hours.* **S.**

ST248f **Nuclear Visions, Environmental Realities** Listed as History 248. *Four credit hours.* **H, I.** JOSEPHSON

[ST249] **Life Sciences and Society** Listed as Sociology 249. *Four credit hours.* **S.**

[ST252] **Medicine and Visual Culture** Listed as Art 252. *Four credit hours.* **A.**

ST257s **Science Fictions** Listed as English 247. *Four credit hours.* **L.** ARDAM

[ST259] **Plants of the Tropics** Listed as Biology 259. *Three credit hours.*

[ST263] **Weird Fictions (in English)** Listed as German 263. *Four credit hours.* **L.**

ST283f **Environmental Humanities: Stories of Crisis and Resilience** *Four credit hours.* **L.** WALKER

ST285f **History of Photography** Listed as Art 285. *Four credit hours.* **A.** SALTZ

ST297f **Global Food, Health, and Society** A seminar introducing important international historical episodes and contemporary issues regarding ways in which food became crucial to human health in society. Students will learn how food practices, originally bounded within certain places and cultures, became transformed in modern societies with the rise of modern agricultural, transportation technologies, and nutrition science, and the public and global health consequences of these transformations. Sessions will include lectures, seminar discussions, field visits, and other hands-on activities. *Four credit hours.* **S, I.** JIANG

ST297Bf **Nature in Italian Literature and Film (in English)** Listed as Italian 297. *Four credit hours.* **L.** FERRANDO

[ST297J] **World History of Biology** Examines the emergence and development of life sciences since 1700 by introducing major ideas, approaches, and debates about life as well as their material and cultural underpinnings and social impacts. Discussion focuses on the various understandings, modifications, and representations of them in different nations and cultures in the 20th and 21st centuries. Students will develop skills in discussion, analysis, research, writing, and presentation. *Three credit hours.* **H.**

ST298s **Seafood Forensics: Uncovering Fraud in Ocean Food Systems** Listed as Environmental Studies 398. *Four credit hours.* RASHER

ST317s **Philosophy of Science** Listed as Philosophy 317. *Four credit hours.* COHEN

ST341s **Culture, Mobility, Identity: Encounters in the African Diaspora** Listed as Anthropology 341. *Four credit hours.* **S, I.** BHIMULL

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

[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.** FLEMING

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.* FLEMING

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