Professor: James Evans; Kristin Johnson (on leave 2020-2021)

Associate Professor: Amy Fisher, *Director*

Advisory Committee: John Hanson, *Chemistry*; David Latimer, *Physics*; Douglas Sackman, *History*; Leslie Saucedo, *Biology*; Justin Tiehen, *Philosophy*

About the Program

Science and technology are not isolated activities: they are inextricably linked to every other aspect of human experience. Science and technology have important connections to literature, philosophy, religion, art, economics, and to social and political history. Scientific evidence and argument are part of continuing lively debates on issues at every level of generality: social policy, the utilization of natural resources, the allocation of health care, the origin and evolution of life, the place of humankind in the natural order, and the nature of the universe.

Science, Technology, and Society courses explore the connections between the sciences and other parts of the human endeavor. Students in the program develop an understanding of 1) how the broader culture influences the development of science and how science influences different societies and cultures, and 2) the interplay between science and economics, politics, religion, and values in contemporary decision making. Many Science, Technology, and Society courses are cross-disciplinary in nature. Faculty from more than a dozen different disciplines within and outside of the sciences participate in Science, Technology, and Society.

Majors in the Program in Science, Technology, and Society develop a strong understanding of the practice of science and technology, which provides excellent preparation for careers in medicine, education, law, public policy, and university research and teaching. Minors, especially those majoring in a science, and students taking individual courses broaden their understanding of this important area of human endeavor.

General Requirements for the Major or Minor

General university degree requirements stipulate that 1) at least four units of the major or three units of the minor be taken in residence at Puget Sound; 2) students earn a GPA of 2.0 in courses taken for the major or the minor; and 3) all courses taken for a major or minor must be taken for graded credit. Any exceptions to these stipulations are indicated in the major and minor degree requirements listed below.

Requirements for the Major

The Bachelor of Arts degree in Science, Technology, and Society is awarded on the basis of a course of study agreed upon by the student and a committee of faculty members. During the sophomore year or by the first semester of the junior year, a student who intends to major in Science, Technology, and Society should meet with the director of the Program to select a faculty member as an advisor. The student and advisor form a committee that includes the advisor and others members from the Advisory Committee for the Program in Science, Technology, and Society. The committee may include faculty outside the program if the student's interests overlap with that faculty member's discipline. The student works with the committee to select a coherent set of courses that advance the student's educational goals. The committee usually seeks a balance between breadth of coverage and focus in the student's particular area of interest. The committee will also ensure that there is sufficient concentration in STS courses (in distinction from courses in cognate disciplines that are accepted as electives). The contract goes into effect after it is signed by the student, the committee members, and the director of the Program and is filed in the Office of the Registrar. The contract is reviewed periodically and justified modifications are permitted.

Requirements for the Contract in Science, Technology, and Society

Every contract should consist of a minimum of 12 units distributed as follows:

1. **Introductory Surveys:** 2 units.
   STS 201 Introduction to Science, Technology, and Society I: Antiquity to 1800; and
   STS 202 Introduction to Science, Technology, and Society II: Since 1800. Preferably taken in the first or second year.
2. **Methods course:** 1 unit.
   STS 350 The Interdisciplinary Study of Science and Technology. Preferably taken in the fall semester of junior year.
3. **Philosophy and Science:** 1 unit.
   One course chosen from PHIL 332 Philosophy of Science; or PHIL 220 Seventeenth- and Eighteenth-Century Philosophy. (A different course in philosophy can be approved by the STS director.) Preferably taken in the spring semester of junior year.
4. **Electives:** 5 units.
   See the list of electives below. Students must take at least one course each from categories one, two, and three. The remaining two courses can be taken from any of the three categories.
5. **Ancillary Courses:** 2 units.
   Two courses in the natural sciences. Preferably in the same natural science. Preferably taken in the first or second year.
6. **Capstone course**: 1 unit.
   Taken in spring semester of the senior year.
   STS 480 Senior Research Seminar in STS.

Notes

1. Students must maintain a grade point average of at least 2.00 in all contract courses and a grade point average of at least 2.00 in the upper-division (300-400 level) courses in the contract.
2. Students must complete at least four units of the required upper-division (300-400 level) contract courses at Puget Sound. One of these 4 units may be a course taken as part of a study-abroad program, subject to approval in advance by the student's contract committee.
3. Students must gain approval for the contract before completing upper-division coursework. Courses completed before the contract is approved are subject to review by the committee prior to inclusion in the contract.

Each year, the STS program will name one graduating major a Mott Greene Research Scholar for a distinguished senior research project. All graduating majors are eligible to be considered for Honors in the Major.

Requirements for the Minor

A minor consists of 5 units distributed as follows.

1. **Introductory Survey:** 1 unit.
   One course chosen from STS 201 Introduction to Science, Technology, and Society I: Antiquity to 1800; or
   STS 202 Introduction to Science, Technology, and Society II: Since 1800
2. **Electives:** 3 units.
   See the list of electives below. Students must take at least one class from each of the three categories.

3. **Methods course:** 1 unit.
   STS 350 The Interdisciplinary Study of Science and Technology

Electives

1. Studies of Particular Scientific Disciplines
   ECON 221 History of Economic Thought
   PHYS 299 History and Practice of Ancient Astronomy
   PSYC 325 History and Systems of Psychology
   STS 100 Apes, Angels & Darwin
   STS 301 Technology and Culture
   STS 314 Cosmological Thought
   STS 330 Evolution and Society Since Darwin
   STS 344 Ecological Knowledge in Historical Perspective
   STS 345 Science and War in the Modern World
   STS 347 Better Living Through Chemistry
   STS 348 Strange Realities: Physics in the Twentieth Century

2. Special Topics in Science, Technology, and Society
   CONN 354 Hormones, Sex, Society and Self
   CONN 357 Exploring Animal Minds
   CONN 410 Science and Economics of Climate Change
   ECON 365 Economics and Philosophy
   ENGL 348 Illness and Narrative
   HIST 317 European Intellectual History, 19th and 20th Centuries
   PHIL 220 Seventeenth- and Eighteenth-Century Philosophy
   PHIL 330 Epistemology: The Theory of Knowledge
   PHIL 332 Philosophy of Science
   SOAN 360 Sociology of Health and Medicine
   STS 310 I, Robot - Humans and Machines in the 20th and 21st Centuries
   STS 318 Science and Gender
   STS 325 Highway to History: A Study of the Automobile Industry
   STS 340 Finding Order in Nature
   STS 352 Memory in a Social Context
   STS 354 Murder and Mayhem under the Microscope
   STS 361 Mars Exploration
   STS 366 History of Medicine

3. Policy and Values in Science and Technology
   BUS 478 Environmental Law
   CONN 320 Health and Medicine
   CONN 393 Cognitive Foundations of Morality and Religion
   ENVR 335 Thinking about Biodiversity
   HIST 364 American Environmental History
   PHIL 105 Neuroethics and Human Enhancement
   PHIL 285 Environmental Ethics
   PHIL 292/BIOE 292 Basics of Bioethics
   REL 292/BIOE 292 Basics of Bioethics
   SOAN 352 Work, Culture, and Globalization
   STS 302 Cancer and Society
   STS 324 Science and Race: A History
   STS 333 Evolution and Ethics
   STS 370 Science and Religion: Historical Perspectives
   STS 375 Science and Politics
   STS 378 Weapons of Mass Destruction

Course Offerings

Unless otherwise specified, each course carries 1 unit of credit and is offered at least once each academic year. Please see "Frequency of Course Offerings" on page 10.

Seminars in Scholarly Inquiry. *See Seminars in Scholarly Inquiry in the Core Curriculum section of this Bulletin for course descriptions (page 10).*

SSI1 181 Science and Theater
SSI1/SSI2 153 Scientific Controversies
SSI2 149 Creationism vs Evolution in the U.S.
SSI2 159 Evolution for All

Connections courses. *See Connections in the Core Curriculum section of this Bulletin for course descriptions.*

301 Technology and Culture
302 Cancer and Society
314 Cosmological Thought
318 Science and Gender
330 Evolution and Society Since Darwin
333 Evolution and Ethics
340 Finding Order in Nature
345 Science and War in the Modern World
347 Better Living Through Chemistry
348 Strange Realities: Physics in the Twentieth Century
352 Memory in a Social Context
354 Murder and Mayhem under the Microscope
361 Mars Exploration
370 Science and Religion: Historical Perspectives
375 Science and Politics

100 Apes, Angels, and Darwin Benjamin Disraeli described the question placed before society by Charles Darwin's work as follows: "Is man an ape or an angel?" This course examines the development of evolutionary thinking during the nineteenth century and the resulting debates over the "Descent of Man." It explores the relationship between Darwin's theory of evolution and the social, political and religious history of Britain and the British Empire in the nineteenth century. The course serves as an introduction to analyzing the interactions between science and society, with particular attention to how Darwin's theory intersected with debates over God, Science, Empire, Ethics, Race, Gender, Economics, and Politics. *Satisfies the Humanistic Approaches core requirement. Offered every other year.*

201 Science, Technology & Society: Antiquity to 1800 This is a history of science, technology, and society from Antiquity to 1800 C.E. It emphasizes both the theoretical understanding of nature and the practical mastery of the technologies of settled existence. It is the first part of a two-semester survey required of majors and minors in Science, Technology, and Society, though it is open to all students. There are no prerequisites, but the course assumes a working knowledge of biology, chemistry, and geometry at the high school level. Topics include: astronomy and mathematics in ancient Mesopotamia and Greece; Islamic medicine; Renaissance anatomy and physiology; the Scientific Revolution of the seventeenth century; electricity, chemistry and natural history in the Enlightenment. Issues addressed include: the role of cultural institutions in the production and diffusion of scientific ideas; the transmission of science across linguistic and cultural boundaries; the interaction of science with religion, philosophy and political life. *Satisfies the Humanistic Approaches core requirement. Offered each Fall.*

202 Science, Technology, and Society II: Since 1800 Students in this course analyze the development of the physical and biological sciences throughout the nineteenth and twentieth centuries, paying special attention to the reciprocal relationship between scientific developments and their social influences. Beginning with the social and intellectual upheaval of the French Revolution and working through the first half of the twenti-

eth century, this course surveys natural scientists' landmark discoveries and interpretations and examines the intellectual, social, natural, and personal influences that helped shape their work. Subjects of the course include Newtonianism, creationism, natural theology, evolution, the origin and demise of electromagnetic worldview, Einstein and the development of the theories of relativity, scientific institutions and methodologies, quantum mechanics, the atomic theory, molecular biology, big science, and modern genetics. *STS 202 is meant as a complement to STS 201, but the prior course, while recommended, is not a prerequisite. Satisfies the Humanistic Approaches core requirement. Offered each Spring.*

300 STEM, Society, and Justice 0.25 activity credit. This is a Special Topics course designed by students with the support of faculty to promote project-based learning for topics that do not fit within the rubric of an independent study or an existing full-unit course. The course broadly addresses themes related to STEM and social justice in a range of ways. Examples include designing a syllabus and seminar series on diversity in STEM or composing supplementary material for science courses on issues that relate to society and justice. *Pass/fail grading.*

301 Technology and Culture Science and technology revolutionize our lives, but memory, tradition and myth frame our response. Technology has powerfully shaped and altered human experience. In this course, students examine what is technology, how is our relationship with technology changing, how does technology shape our modern culture and, in turn, how does our culture shape our technology. Topics covered may include: the industrial revolution, the airplane, Julia Child's kitchen, the Chernobyl disaster, and the development of the internet. Satisfies the Connections core requirement. *Offered every other year.*

310 I, Robot—Humans and Machines in the 20th and 21st Centuries In the mid 20th century, science-fiction writer Isaac Asimov envisioned the world in 2029 filled with complex and autonomous machines, capable of caring for children and engaging in interplanetary travel, mining, and political and military action. In contrast to this fictional world, how and why did the real inventors of computers, cybernetics, and robotic machinery create these technologies? What future(s) did they imagine for their inventions, and how did they understand the relationship between humans and machines? Did they envision an Asimovian future or something completely different? Did these technologies challenge them to re-think what it means to be human? Why or why not? In this course, students investigate the history of these fields to develop a better understanding of technology, society, and values in the 20th and 21st centuries. *Offered every other year.*

324 Science and Race: A History This course examines the history of ideas about race in biology since the eighteenth century. Students study how and why knowledge about race has been constructed and used in particular contexts, and, in doing so, examine the complex relationship between science and society. *Satisfies the Knowledge, Identity, and Power graduation requirement.*

325 Highway to History: A Study of the Automobile Industry Although inventors in different countries and time periods contributed to the invention of the automobile, the car remains a symbol of American engineering and technological prowess, personal independence, adulthood, and social status. This course examines the intellectual and social history of the automobile in the United States and abroad. By analyzing cars as products of a large technological system, including, for example, tire manufacture, oil and gas production, road construction, gas stations, and a variety of other ancillary industries, this class investigates the social, economic, environmental, and cultural impacts of the automobile. *Offered every other year.*

344 Ecological Knowledge in Historical Perspective This course examines the history of both scientific ecology and recent movements to interrogate, question, and revise the West's understanding of nature, including Traditional Ecological Knowledge (TEK). In doing so the course places both defenses and critiques of Western science in historical context, with particular emphasis on potential implications for environmental policy. Students examine how the rise of conservation and environ-mentalism, responses to imperialism and colonialism, and debates over the role of activism and advocacy in science have influenced ecologists' work, identity, and organizations. In doing so students study the interaction between science and society, while considering the important insights a historical understanding of science can bring to understanding modern concerns and controversies. *Satisfies the Humanistic Approaches core requirement. Satisfies the Knowledge, Identity, and Power graduation requirement. Offered every other year.*

345 Science and War in the Modern World This course examines the connections between 20th century science (with particular emphasis on physics) and the effects of science on public policy, international relations, and the strategy and tactics of modern warfare. During the first half of the 20th century, physicists' concepts of the universe changed as new fields of thought emerged: relativity, quantum theory, and eventually nuclear physics. At the same time, the interactions between scientists and governments evolved significantly, as the scope of war expanded and, in response, new technologies were integrated into warfighting. The course focuses on the role that scientists played in the two world wars, culminating in the Manhattan Project, which produced the first atomic bombs. It also examines the consequences of scientific and technological advancements for the conduct of 20th century warfare, including the impact of trains and machine guns on the battlefields of the First World War and of tanks and airpower in World War II. After considering the development of the atomic bomb and the results of its use against Japan, the course moves to explore the role of nuclear weapons during the Cold War and in the 21st century, as well as the emergence of new science-based military technologies, such as cyberwar. *Satisfies the Connections core requirement.*

347 Better Living Through Chemistry "Better things for better living…through chemistry" was a popular slogan used by DuPont in the mid-to-late twentieth century to market laboratory-developed products. Increasingly, concerns have been raised about the merits and consequences of chemicals in our food, goods, and environment. This class analyzes how we know what we know about chemistry, and how studies of the very small shape fundamental questions about the world, e.g. what is natural, what is artificial, does the difference matter, and if so in what contexts? By investigating a series of historical episodes that highlight some of the key intellectual, social, and political challenges of the nineteenth and twentieth centuries, this course examines how we learn about, modify, and relate to our environment chemically. From the development of the periodic table to the study of pollution, this course encourages students to gain an appreciation for the science of chemistry while engaging in cross-disciplinary dialogue about ways in which chemistry affects our daily lives. *Satisfies the Connections core requirement.*

350 Interdisciplinary Study of Science and Technology This seminar is required of all majors and minors in STS, but is also open to all students interested in the relationships between science, technology and society. Students study various approaches developed by historians, sociologists and philosophers of science and technology. The methods and approaches learned in this course provide a foundation for the STS Senior Seminar, in which stu-dents complete a substantial research project on a topic of their choice. For non-majors, the course offers an overview of

how and why scholars have studied science and technology in different ways, and also provides an opportunity to practice thinking, talking and writing about science beyond traditional disciplinary boundaries. *Prereq: STS 201 or STS 202 or permission of STS Director. Offered every fall.*

354 Murder and Mayhem under the Microscope Why do people commit crimes and what role does forensic science play in determining who is culpable? Using a historical approach, this course examines the development of forensic science and criminology. It focuses on the history of forensic medicine and psychology, fingerprinting, toxicology, blood typing, DNA evidence as well as the role of expert witnesses in homicide investigations. It also includes a discussion of the legal issues surrounding what constitutes admissible evidence and how that has changed over time. *Satisfies the Connections core requirement.*

366 History of Medicine This course surveys the history of medicine from ancient times to the present, guided by the following questions. How have people in different times and contexts made sense of health, disease, and healing? How have changing conceptions of nature and the scientific study of the human body influenced medicine? What have been the social, political, and institutional contexts in which medicine has been done and developed? How has the role of the doctor and patient relationship changed, and how have conceptions of a "good doctor" and "good medicine" changed? How have the problems of access to and distribution of medical care been approached? Examining each of these questions in historical context will, in turn, provide a foundation for contemplating modern issues in medical research and practice, as well as medicine's place in modern society. *Offered every other year.*

378 Weapons of Mass Destruction During World War I, teams of chemists, engineers, and military leaders in Germany, France, the United States and elsewhere worked to prepare chemical weapons that could be deployed on battlefields. The field use of chemical weapons proved to be difficult and unreliable so they were little used as combat weapons in World War II, though related chemicals were key tools of the Nazi holocaust. Chemical weapons have also been deployed often in smaller conflicts, including very recently. If the first world war was the chemists' war, the second was the physicists' and led to the development and use of nuclear weapons. Fortunately, there has not yet been a biologists' war, although germ warfare has been an active area of research by national governments. In the period after World War II, international efforts at controlling weapons of mass destruction, preventing their proliferation to other nations, and protecting stockpiles from falling into unauthorized hands has proved to be difficult and complicated. In this course students become familiar with the history of weapons of mass destruction and analyze humanitarian, political, and geopolitical arguments about their development and possible use. Students also learn to evaluate strategies for their control. *Offered every other year.*

480 Senior Research Seminar in STS In this course students will carry out original research and compose an extensive, original research paper on an approved topic, building on the approaches examined in STS 350. This will consist of the creation of an extensive annotated bibliography and research paper on an STS topic of each student's choice. *Prerequisite: STS 201, 202 and 350. Offered every Spring starting Spring 2022.*

490 Senior Seminar This seminar is required of all majors and minors in STS, and is offered in the Fall of each year. It is a practicum in the research methods of Science, Technology, and Society in which students work closely with the instructor to develop a familiarity with research sources and strategies. Students become familiar with the history and development of the STS disciplines and with a range of research approaches that are open to them for their own work. Students formulate major research proposals, complete a substantial research paper, and make oral presentations of their work. Students who write a thesis in the Spring of the Senior year generally use their STS 490 project as a springboard.

491 Senior Thesis Instructor permission required. *Note that achievement of a B+ or higher in STS 490 is required to register for STS 491.*

492 Senior Thesis Seminar Students in this course build on research completed in STS 490 Senior Seminar to complete an extensive research project on an STS topic. Instructor permission required. Note that achievement of a B+ or higher in STS 490 is required to register for STS 492.