

# History of Science and Technology

The Department of the History of Science and Technology offers an undergraduate program leading to the degree of Bachelor of Arts with a major in science and technology, and a graduate program leading to the degree of doctor of philosophy.

## The Faculty

**Owen Hannaway**, Professor Emeritus: history of chemistry from the Renaissance to the present, history of science in early modern Europe.

**Robert H. Kargon**, Willis K. Shepard Professor of the History of Science: history of physics; science and social change; science in America.

**Sharon Kingsland**, Professor (Chair): history of biology, especially ecology, genetics and behavioral biology; science in America.

**Stuart W. Leslie**, Professor: history of technology, history of science-based industry.

**Morris Low**, Assistant Professor: Chair, History of East Asian Science and Technology. Japanese physics and technology, cultural history of science in Japan.

**Lawrence M. Principe**, Professor: history of chemistry and alchemy, early modern science, science and religion.

## Affiliated Faculty School of Medicine

**Jerome J. Bylebyl**, Associate Professor: Renaissance and 17th-century medicine, especially anatomy and physiology; medical education; ancient medicine and biology.

**Nathaniel C. Comfort**, Associate Professor: history of biology, especially genetics, molecular biology, and biomedicine; history of recent science, oral-history and interviewing. Current project: History of human and medical genetics in America.

**Mary E. Fissell**, Associate Professor: European health care and popular medicine, 17th and 18th centuries; early modern gender and the body.

**Marta Hanson**, Assistant Professor: history of East Asian Medicine; History of Chinese science and medicine; history of epidemics and disease in China.

**Harry M. Marks**, Associate Professor, Elizabeth Treide and A. McGehee Harvey Professor in the History of Medicine: history of medicine, 20th century; medical research, history and policy; history of public health; history of disease.

**Graham Mooney**, Assistant Professor: history of public health 19th and 20th centuries; historical epidemiology; historical demography; disease surveillance and risk.

**Randall M. Packard**, William H. Welch Professor of History of Medicine: history of disease; public health; and medicine, health, and disease in Africa.

**Daniel P. Todes**, Professor: history of Russian medicine and science, social relations of scientific thought, history of biomedical sciences.

## Part-Time and Joint Appointments

**James D. Goodyear**, Senior Lecturer: history of tropical medicine, history of 18th- and 19th-century Latin America.

## Undergraduate Program

(See also General Requirements for Departmental Majors, page 46.)

The department offers a variety of courses that deal with the history of the conceptual and technical development of the sciences, as well as the cultural and social impact of science and technology on Western civilization. These courses are open to all undergraduates in the Schools of Arts and Sciences and Engineering. A few of the courses require some background in an appropriate science, but others are accessible to those with no specialized knowledge who want to understand the part science has played in shaping modern culture. Students who have concerns about their technical competence for a given course should consult the professor involved.

## Major in History of Science and Technology

Offered in cooperation with the Institute of the History of Medicine, this major allows students to combine substantive work in science with study of the social and historical context of modern science, medicine, and technology. The aim of the program is to produce graduates who are scientifically literate and technically competent, and who at the same time understand science and medicine not as static, autonomous enterprises but rather as modes of thought that have developed in specific social contexts.

The major is appropriate for any student planning a career in medicine or other areas of the health care industry. It is also flexible enough to serve as a basis for a variety of careers where an informed knowledge of science and technology and their impact on society is important. Such careers include broad areas of business and industry, journalism, teaching, museum work, and specialized areas of law and public policy.

## Requirements for the B.A. Degree

### • Sciences:

In the sciences, students are required to have one semester of introductory calculus and a total of 30 credits coded (N), of which at least nine credits must be above the 100-level. These may be counted as part of the University's distribution requirements. Laboratory courses in science count toward this requirement.

### • History of Science and Technology:

A total of 24 credits of course work in the history of science and technology are required. These must include at least two survey courses and four additional courses above the 100-level. (Survey courses are those numbered 140.103-109, 301-303, and 321.) Students in their senior year may take graduate courses, with permission. Students who demonstrate excellence in course work are eligible to write an honors thesis in their final year, for four credits. Students must have outstanding recommendations from two department members to be eligible for the thesis. Departmental honors are conferred if overall GPA is 3.5 and the thesis grade is A- or higher.

### • Other Distribution Requirements:

Students must take twelve credits outside of the department: six credits coded (H) or (S), and six credits coded (H), (S), (E), or (Q). The choice of courses must be approved by the undergraduate adviser.

## Minor in the History of Science and Technology

The department offers a minor which may be combined with other science, social science, or humanities majors. To complete the requirements for the minor, students must have a total of 21 credits in the history of science, medicine, or technology, including at least one survey course. Students may elect one course outside the department, with the adviser's approval.

## Graduate Programs

### Ph.D. in the History of Science and Technology

The graduate program in the history of science and technology leads to the Ph.D. degree. Although an M.A. degree is granted, candidates who seek only that degree are not ordinarily admitted. The object of the Ph.D. program is to provide the rigorous training necessary for a scholarly career in teaching and research; consequently, the focus of

the student's activity will be the research seminars of the department. Faculty from the Institute of the History of Medicine in the School of Medicine also participate in the program.

### Admission

Application deadline is January 15th. All supplemental materials (official transcripts, three letters of recommendation, official GRE scores, and, when applicable, official TOFEL scores) should be sent directly to the department at:

The Department of the History of  
Science and Technology  
3505 North Charles Street  
Baltimore, Maryland 21218

For further information on our faculty and programs, please visit our Web site at: <http://www.jhu.edu/host/>

### Requirements for the Ph.D. Degree

Before candidates begin full-time research on their dissertations, they must prepare themselves adequately in the appropriate fields of knowledge, become skilled in the techniques of historical research, and be able to carry out a sustained piece of historical analysis and writing.

In the first year of the program students are introduced to the methods and techniques of research and complete a yearlong survey course in the history of science or the history of medicine. Students in their second year of study present a research paper to the department. In the second and third years of study, students prepare a field in history and two specialized fields in the history of science, medicine, or technology. The fields are individually arranged and satisfied. The fields entail broad and intensive reading and the passing of a comprehensive examination and/or presentation of a major research paper. Before being admitted for formal candidacy for the degree, the student must also demonstrate a reading knowledge of two foreign languages. The final requirement for the Ph.D. degree is the completion of a dissertation that is an original contribution to historical knowledge and of a standard suitable for publication.

The History of Science and Technology is by its nature interdisciplinary, and students are encouraged to undertake study in related areas such as history, philosophy, and the natural and medical sciences.

## Program in the History and Philosophy of Science

The Center for the History and Philosophy of Science was created in 1969 for the purpose of fostering a closer relationship at Johns Hopkins University between the two disciplines of the history and the philosophy of science. The center administers a graduate program, described below, and a speakers program, in which visiting scholars are invited to the campus to deliver lectures and participate in colloquia and discussions.

Graduate students in either the Department of Philosophy or the Department of the History of Science and Technology may apply to enroll in the special program of studies in the History and Philosophy of Science coordinated by the center. Those accepted for this program take six semester courses in the history and philosophy of science, as follows:

- Two semester courses at the 300-level in the history of science
- Two semester courses in the philosophy of science, including the survey course 150.431
- One course in the philosophy of science
- One course in the history of science

These last two courses are to be drawn from an approved list in history of philosophy, philosophy of science, and history of science. At least one course in the history of science and one course in the philosophy of science must be at the 600-level.

Students who fulfill the requirements for this special program are certified by the Center for the History and Philosophy of Science. They receive their Ph.D. from one of the two departments in accordance with that department's requirements.

## Facilities

The Eisenhower Library and the Welch Medical Library contain about two million volumes, including the special collections of the Institute of the History of Medicine in Baltimore. These research facilities are supplemented by the rare book holdings at Evergreen House, the Pratt Library, and the Peabody Library.

Other important research collections are available to students. In Philadelphia, collections include the Chemical Heritage Foundation, the American Philosophical Society, and the Academy of Natural Sciences. The Hagley Museum and Library's collections in the history of American science and technology are within easy distance of campus, as are the incomparable holdings of the Library of Congress, the National Library of Medicine, and other governmental agencies in Washington, D.C.

## Financial Aid

The department has several graduate fellowships and teaching assistantships. Students may also be eligible for federal financial support through the National Science Foundation. Information on these and other fellowships can be obtained through the fellowship adviser at the student's college, or from the Fellowship Office of the National Academy of Sciences, National Research Council, Washington, D.C. 20025. In the recent past, doctoral candidates have also won support for their research in the United States and abroad through such sources as the Smithsonian Fellowships, the Fulbright-Hays grants, the Spencer Foundation, and the Deutscher Akademischer Austauschdienst (DAAD) Fellowship.

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## Undergraduate Courses

### 140.105 (H,S) History of Medicine: Antiquity through the Scientific Revolution

The first part of this course provides an overview of the medical traditions of six ancient cultures: Egypt, Mesopotamia, China, India, Greece, and Islam. The second part considers the subsequent development of the Greek and Islamic traditions in Europe during the Middle Ages and Renaissance. The last part focuses on the reform and displacement of the Classical tradition during the Scientific Revolution of the 16th and 17th centuries. Graduate students register for 150.701, School of Medicine.

Bylebyl 3 credits

### 140.106 (H,S) History of Medicine: 18th-20th Centuries

This course examines medical and bodily practices in their social and historical settings, in Europe and Amer-

ica, from the 18th century to the present. Graduate students register for 150.701, School of Medicine.

Fissell, Marks 3 credits

### 140.111 (H,S,W) Freshman Seminar I

Staff 3 credits

### 140.115 (H,S,W) Freshman Seminar II

Staff 3 credits

### 140.124 (H,S) Women and Medicine

This course explores the history of women as practitioners and patients as well as objects of medical inquiry from the Middle Ages to the present.

Fissell 3 credits

**140.133 (H,S) Technology and Gender in East Asia**

This course examines the social shaping of technology in China and Japan and how its history has reflected gender divisions and inequalities. Topics include the gendered nature of textile production; wartime mobilization; the marketing of consumer electronics; sex-based differences in education and the workplace; popular culture; and the use of the Internet.

Low 3 credits

**140.301 (H,S) History of Science: Antiquity to the Renaissance**

The first part of a three-part survey of the history of science. This course deals with the concepts, practice, and the cultural roles of scientific thought from classical antiquity to the time of Copernicus. Topics include the pre-Socratics, the systems of Plato and Aristotle and their continuing influence, Islamic science, Latin medieval scholasticism and the universities, and Renaissance hermeticism/natural magic. Interactions across science, art, technology, and theology are highlighted.

Principe 3 credits

**140.302 (H,S) Rise of Modern Science**

*This is the third part of a three-part survey of the history of science.*

Course surveys some of the most important developments of modern science from the 18th century to the late 20th century, that is, from the spread of Newtonianism to the rise of molecular biology and big science. The content of scientific theories and the rise of experimental science, the changing relationship between science and technology, and the role of scientific institutions in the scientific enterprise are major themes.

Kingsland 3 credits

**140.306 (H,S) Science and Religion**

Topics include the Patristic "Athens-Jerusalem" struggle, status of secular and religious thought in medieval society, the Galileo affair, evolution, and the origin of current perspectives in science and religion.

Principe 3 credits

**140.309 (H,S) History of the American Automobile**

The technological development, business context, and social impact of the American automobile. Topics include history of recurrent fuel crises and their effect on engine design, evolving business structure of automobile firms and their response to new competitive environments, and the social implications of the automotive technological networks.

Leslie 3 credits

**140.321 (H,S) History of Science: Scientific Revolution**

This is the second part of a three-part survey of the history of science. This course concerns developments in early modern Europe known as the Scientific Revolution. Topics include cosmology, astronomy, mechanics, natural history, and chemistry. Issues involving magic, technology, humanism, and the social content of early modern science will also be studied.

Principe 3 credits

**140.323 (H,S) The Natural and the Artificial: The Concept of Man-Made Man**

This course will trace the concept of the artificial human being from the medieval-Renaissance Golem legend through Frankenstein, and the contemporary "cyborg," attempting to illustrate changing understanding of human "nature," and the changing relationship of mankind to science and technology. Readings from such authors as Goethe, Mary Shelley, and H. G. Wells will be supplemented by film presentations.

Kargon 3 credits

**140.325 (H,S) Culture, Communication, and Technology**

After examining oral communication, emergence of writing, printing, perspective, and extensions of the senses (telescope, camera, radio, telephone), seminar focuses on the emergence of visual culture in the 20th century.

Kargon 3 credits

**140.329 (H,S) Seven Wonders of the Modern World**

Everyone knows the Seven Wonders of the ancient world, but what about their modern counterparts? Course explores seven modern engineering marvels (e.g., Eiffel Tower, Hoover Dam) to discover the ingredients of successful large-scale engineering.

Leslie 3 credits

**140.331 (H,S) History of Chemistry**

This course surveys the development of chemistry from antiquity to the modern period. It will stress the changing ways of visualizing and explaining the nature and changes of material substances, and the historical context and ramifications of such views. Recent reevaluations of the history of chemistry will be examined. Topics include atomism/corpuscularianism, alchemy, Paracelsianism, mechanical chemistry, and the 19th-century rise of modern chemistry.

Principe 3 credits

**140.335 (H,S) Debating Evolution**

This seminar examines various controversies in evolutionary biology from Darwin's time to the present. Topics include analysis of Darwin's work and its impact, genetics and evolutionary thought, comparison of approaches to the study of evolution in the field sciences and experimental biology, theories of human evolution, and the rise of Darwinian medicine. Course considers the social impact of science as well as the practice of science and developments of scientific ideas.

Kingsland 3 credits

**140.336 (H,S) Health, Risk, and History**

Seminar reviews modernist notions of "risk society" and how and why they have come to pervade public health discourse and practice. Broad themes include the idea, computation and communication of risk.

Mooney 3 credits

**140.337 (H,S) Dissecting the Human Body**

The practice of human dissection and its social, scientific, and medical implications. Antiquity to modern.

Bylebyl 3 credits

**140.339 (H,S) Japan on Display: Photography, Expositions, and Museums**

Course outlines the role of display in the modernization of Japan from the late 19th century through to the present-day. It highlights the importance of photography, participation in international expositions, and the building of museum collections for US-Japan relations.

Low 3 credits

**140.346 (H,S) History of Chinese Medicine**

How did Chinese conceptualize the human body, health and disease over the past 2,000 years? How did these concepts change over time and differ according to region? Why do gender, class, and place matter? Who practiced medicine in China, what did they practice, where, and how do we know what we know about them? These are some of the questions students will engage by discussing the most recent historical, anthropological, and philosophical scholarship on the history of medicine in China and reading a wide range of primary sources on Chinese medicine in English translation.

Hanson 3 credits

**140.350 (H,S,W) Japan and the Environment**

Examines traditional attitudes to nature, tensions between economic growth and the environment, and the shift from domestic to global environmental concerns.

Low 3 credits

**140.351-352 (H,S) Seminar in the History of Life Sciences**

Selected readings from primary and secondary sources, exploring an appropriate theme in the history of the life sciences. Topics to be arranged.

Kingsland 3 credits

**140.360 (H,S,W) Changes in the Land: Science, Technology, and the American Environment**

Introduces students to topics and methods in environmental history through readings in U.S. history beginning with the settlement of New England through the ecology movement of the 1960s.

Kingsland 3 credits

**140.373 The Body and Health Care in Japan**

This course explores differing conceptions of the body and health care in Japan from the eighteenth century through to the present day. It examines the influence of Chinese medicine; the introduction of Western medicine; the increasing role of the state in the health of the Japanese people from the late nineteenth century; Social Darwinism and eugenics; the prevalence of abortions; and controversies surrounding organ transplants.

Low

**140.382 (H,S) Sickness and Health in Early Modern Europe**

The social history of birth, death, sickness, and health is discussed in conjunction with the development of health-care institutions and state and social responses to disease, 1500-1800.

Fissell 3 credits

**140.384 (H,S) Analogy and Metaphor in Science, Medicine, and Technology**

How do metaphors in science, technology, and medicine originate and how do they influence human thought? The course explores such examples as William Harvey's analogy between the heart and a pump, Charles Darwin's concepts of the struggle for existence and natural selection, military metaphors in the history of public health, the use of metaphors of production in medicine, and the comparison of the brain to a computer.

Todes 3 credits

**140.411-412 (H,S,W) Senior Research Seminar**

For majors pursuing independent research.

Staff 2 credits

**140.424 (H,S) Las Vegas: Eighth Wonder of the World**

"Learning from Las Vegas" as a distinctly American city, from the building of Hoover Dam to the opening of the Luxor Hotel. Topics will include gambling and organized crime, entertainment, architecture, film and fiction, city planning, and tourism.

Leslie 3 credits

**140.432 (H,S) Man and the Natural World**

Research seminar explores attitudes toward nature, human-animal relations, urban ecology, from early modern times to the present.

Kingsland 3 credits

**140.501-502 Independent Study**

## Graduate Courses

**140.601 Research Methods in the History of Science, Medicine, and Technology**

An introductory course at the graduate level to the interpretation of historical evidence; to the social, intellectual, and political analysis of historical data; and to contemporary methods in the history of science, medicine, and technology. Co-listed as 150.803, School of Medicine.

Staff

**140.611-612 Seminar in the History of the Physical Sciences**

Kargon, Principe

**140.613-614 Seminar in the History of Technology**

Leslie

**140.615-616 Seminar in the Social Relations of Science**

Staff

**140.617-618 Seminar in the History of the Biological Sciences**

Kingsland, Todes

**140.619-620 Seminar in the History of Medicine**

Bylebyl, Fissell, Marks

**140.626 Advance Seminar in the History of Science, Medicine, and Technology**

Staff

**140.631-632 Readings in the History of Science**

A preliminary directed reading course in the general field of the history of science. Intended primarily for incoming graduate students.

Staff

**140.641-642 Colloquium**

Reports by staff members, students, and invited speakers.

**140.701 History of Medicine: Antiquity to Scientific Revolution**

Bylebyl

**140.702 Outline of the History of Medicine, 18th-20th-Centuries**

Marks

**140.703 Seminar in the Social History of Early Modern Medicine**

Fissell

**140.708 Rise of Modern Science**

Kingsland

**140.710 Scientific Revolution**

Staff

**140.801-802 Directed Reading and Dissertation**

Kargon

**140.811-812 Directed Reading and Dissertation**

Kingsland

**140.831-832 Directed Reading and Dissertation**

Leslie

**140.835-836 Directed Reading and Dissertation**

Principe

**140.837-838 Directed Reading and Dissertation**

Low

**140.853-854 Directed Reading and Dissertation**

Packard

**140.861-862 Directed Reading and Dissertation**

Bylebyl

**140.871-872 Directed Reading and Dissertation**

Marks

**140.873-874 Directed Reading and Dissertation**

Comfort

**140.875-876 Directed Reading and Dissertation**

Hanson

**140.891-892 Directed Reading and Dissertation**

Todes

**140.893-894 Directed Reading and Dissertation**

Fissell

**140.895-896 Directed Reading and Dissertation**

Mooney