

DEPARTMENT OF COMPUTER SCIENCE
University of California, Davis

ECS 188 Ethics in an Age of Technology

4 units

Format Lecture/Discussion – 4 hours

Catalog description

Foundations of ethics. Views of technology. Technology and human values. Costs and benefits of technology. The character of technological change. The social context of work in computer science and engineering.

Prerequisites None

Credit restrictions, cross listings None

Summary of course contents

- I. Views of Technology
- II. Philosophical Ethics
- III. Technology and the Environment
- IV. War and Other Threats to Human Existence
- V. Privacy and Intellectual Property
- VI. Responsibility and Professional Ethics

The course is taught in a participatory format with a maximum enrollment of 20 students. Most class meetings consist of a short quiz followed by an open-ended discussion of the day's reading. Students carry out a project consisting of a term paper of no less than 2000 words and an associated oral presentation of 20 minutes. There are typically two additional writing assignments of 1-2 pages each. Students are graded on their ability to absorb often challenging readings; to construct, analyze, and criticize ethical arguments; and to recognize, discuss, and analyze how the social and political environment shapes technological change, and how technological change creates losers as well as winners

Goals: This course aims to encourage students to think critically about the ethical implications of what computer scientists do. A secondary goal is to promote improved communication skills.

Illustrative reading

A reader assembled by Phillip Rogaway includes work by: Ian Barbour, Robert Heilbroner, Langdon Winner, Neil Postman, Deborah Johnson, Hans Jonas, David Strong, Jared Diamond, Ruth Schwartz Cowan, Freeman Dyson, Marshal McLuhan, Thomas Friedman, Suketu Mehta, the UN IPCC, Garrett Hardin, Amory Lovins, Eric Markusen, Bill Joy, James Boyle, Richard Stallman, Cory Doctorow, Jeff Schmidt, and the ACM.

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GE3 Social Sciences
Scientific Literacy
Writing Experience

Social Science: The topic of this course is the social and economic context of recent and emerging technologies. We consider the role of corporations and economics, the impact of technologies on the nature of work, war, and personal privacy, and environmental impacts. The entire course is devoted to the context and effects of technology rather than the technologies themselves. Readings are drawn from a wide spectrum of literature, mainly in the social sciences.

Scientific Literacy: The course is about the impact of technological advances on society. We consider questions like who wins and who loses as a result of technological change; the impact of technological change on the conduct of war; technology and the environment; and technology and personal privacy. Technical aspects of computing and engineering are topically integrated with a discussion of their impact on the human condition. In readings, films, classroom discussions, and written assignments, students develop an appreciation of both the benefits *and the costs* of technological change. During classroom discussions, written assignments, and exams, students are assessed on their ability to see and explain the nexus between technical change and societal change.

Writing experience: The final project includes a term paper of no less than 2000 words (about 8 pages). Papers are graded on the basis of content and form, including organization, style, use of language, logical coherence, selection of sources, depth of analysis, and so forth. Students must formulate a thesis, construct a convincing argument, marshal evidence to support their claims, and analyze the evidence. There are two milestones prior to turning in this final paper. The first is a one-page project-proposal, and the second is a rough draft of the paper. Students revise their work in response to comments returned from each of these two milestones. Alongside the term paper is an associated oral presentation. These typically have 20-25 slides, which are reviewed as part of the second milestone. Projects are normally carried out by 2-person teams. Finally, two short essays are assigned in the class, each of 1-2 pages.

Overlap There is no significant overlap with any other course since the focus of this course is on ethical issues as they arise in the field of computer science. ENG 190 is a related course on professional ethics and responsibility in engineering.

Instructors Staff

History 2012.09.28 (P. Rogaway): request for Scientific Literacy (new justification statement for that). Prior version by P. Rogaway from April 2008.

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Outcomes

1		an ability to apply knowledge of mathematics, science, computing, and engineering
2		an ability to design and conduct experiments, as well as to analyze and interpret data
3		an ability to design, implement, and evaluate a system, process, component, or program to meet desired needs, within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
4	✓	an ability to function on multi-disciplinary teams
5		an ability to identify, formulate, and solve computer science and engineering problems and define the computing requirements appropriate to their solutions
6	✓	an understanding of professional, ethical, legal, security and social issues and responsibilities
7	✓	an ability to communicate effectively with a range of audiences
8	✓	the broad education necessary to understand the impact of computer science and engineering solutions in a global and societal context
9	✓	a recognition of the need for, and an ability to engage in life-long learning
10	✓	knowledge of contemporary issues
11		an ability to use current techniques, skills, and tools necessary for computing and engineering practice
12		an ability to apply mathematical foundations, algorithmic principles, and computer science and engineering theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
13		an ability to apply design and development principles in the construction of software systems or computer systems of varying complexity