Science, Technology, and Society Course Material

Brief version

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(C): Core material
(S): Supplementary material
(F): Further reading and sources
(R): Reference material

- History of science, technology, and the industrial revolution

  - *Problems in Western Civilization*, expanded two-volume edition. L F Schaefer, D H Fowler, and J E Cooke, eds. Charles Scribner's Sons, New York, 1968: From Tradition to Science, pp 1:369–385; Science and Society, pp 2:298–339. (C)

  - F Braudel. *A History of Civilizations.* Allen Lane Press, The Penguin Press, New York, 1994: Christianity, Humanism and Scientific Thought, pp 333–372; The Industrialization of Europe, pp 373–398. (F)

  - J A Perrolle. *Computers and Social Change.* Wadsworth Publishing Company, Belmont, California, 1987: Information, Property, and Power in History, pp 51–71. (C)

  - R Tarnas. *The Passion of the Western Mind.* Ballantine Books, New York, 1991: The Rising Tide of Secular Thought [in the High Middle Ages], pp 191–193; Critical Scholasticism and Ockham's Razor, pp 200–208; The Renaissance, pp 224–232; The Scientific Revolution, pp 248–271; The Philosophical Revolution, pp 272–281; Foundations of the Modern World View, pp 281–290; The Crisis of Modern Science, pp 355–365. (F)

  - C Van Doren. *A History of Knowledge.* Ballantine Books, New York, 1991: The Invention of Scientific Method, pp 184–212; The Twentieth Century: Science and Technology, pp 321–355; The Next Hundred Years, pp 375–412. (F)

  - A Hellemans and B H Bunch. *Timetables of Science.* Simon and Schuster, New York, 1988. (R)

  - M B Ogilvie. *Women in Science.* MIT Press, Cambridge, Massachusetts, 1988. (R)

- Philosophy of science, the nature of science, and the scientific world view

  - S Richards. *Philosophy and Sociology of Science*, second edition. Basil Blackwell, Oxford, 1987: Introduction, pp 1–4; The Structure of Science, pp 7–13; The Scientific Attitude, pp 28–31. (C)

  - T S Kuhn. *The Structure of Scientific Revolutions*, second edition, enlarged. The University of Chicago Press, Chicago, 1970. (F)

- Social, political, and economic aspects of science and technology

  - Richards: Quantitative and qualitative aspects of science, pp 93–101; Science, Technology and Industry, pp 109–127; Political and Economic Aspects of Research and Development, pp 127–134. (C)

- Science, culture, ethics, and religion

  - Richards: Ethical Dimensions of Science, pp 135–170; Science, Culture, and Religion, pp 171–196. (C)

  - B Russell. *Religion and Science.* Oxford University Press, Oxford, 1961. (F)

- Utopian and progressive visions of science and technology

  - K E Drexler. *Engines of Creation.* Anchor Press, Garden City, New York, 1986: Engines of Construction, pp 1–20, Worlds Enough, and Time, 231–239. (F)

  - The Dreams of Technological Utopianism. In *Computerization and Controversy.* C Dunlop and R Kling, eds. Academic Press, Boston, 1991: pp 14–81. (F)

- Critical perspectives on science and technology

- *Questioning Technology.* J Zerzan and A Carnes, eds. New Society Publishers, Philadelphia, 1991: All introductory sections and readings by Weizenbaum, Merchant, Bradford, Siegel and Markoff, Fulano, Easterbrook, Sardello, Gorman, Winner, pp 1–3, 9–12, 22–25, 32, 36–40, 46–60, 67–70, 91–92, 108, 128–138, 142–158, 163–170, 176, 198. (C)
- J Weizenbaum. In *Computerization and Controversy*: Against the Imperialism of Instrumental Reason, pp 728–742. (C)
- J Weizenbaum. *Computer Power and Human Reason.* W H Freeman, San Francisco, 1976. (F)
- T Roszak. *The Cult of Information*, second edition. University of California Press, Berkeley, California, 1994. (F)
- N Postman. *Technopoly.* Vintage Books, New York, 1993. Originally published by Alfred A. Knopf, New York, 1992. (F)
- A Fausto-Sterling. *Myths of Gender.* Basic Books, New York, 1985: The Biological Connection, pp 3–12; A Question of Genius, pp 13–60; Sex and Science, pp 205–222. (C)

- Social and cultural impact of modern information technology in general
  - M Wessells. *Computer, Self, and Society.* Prentice-Hall, Englewood Cliffs, New Jersey, 1990: Computer, Technology, and Culture, pp 1–23. (S)
  - Perrolle: Information, Society, and Technology, pp 3–27; Social Change, pp 29–49. (F)

- Psychological dimensions of modern information technology
  - S Turkle. *The Second Self.* Simon and Schuster, Inc., New York, 1984: Hackers, pp 196–238. (C)
  - Turkle: Thinking of Yourself as a Machine, pp 271–275, 285–292. (S)
  - Wessells: Minds and Selves, pp 201–225. (S)
  - Wessells: Education, pp 226–250. (S)

- Economic dimensions of modern information technology and its impact on work, management, labor, and organizations
  - Wessells: Automation, Craft, and Skill, pp 35–41; Quality of Work Life, pp 41–47; Management and Labor, pp 48–72; (C)
  - Wessells: Productivity, pp 25–35. (S)
  - Computerization and the Transformation of Work. In *Computerization and Controversy*: pp 182–320. (F)
  - Perrolle: The Computer Transformation of Work, pp 129–180. (F)
  - Economic and Organizational Dimensions of Computerization. In *Computerization and Controversy*: pp 84–180. (S)
  - Wessells: The Global Economy, pp 73–97. (C)

- Political dimensions of modern information technology and its relation to social control and decision making, the democratic process, and human rights
  - Wessells: The Challenge to Privacy, pp 149–171. (C)
  - Perrolle: Information, Property, and Power in Democratic Institutions, pp 181–236. (F)
  - Social Control and Privacy. In *Computerization and Controversy*: pp 410–522. (F)

- Modern information technology and social relationships
  - C Dunlop and R Kling. In *Computerization and Controversy*: Social Relationships in Electronic Communities, pp 322–329. (S)
  - L Van Gelder. In *Computerization and Controversy*: The Strange Case of the Electronic Lover, pp 364–375. (F)

- Security and reliability issues and legal aspects of modern information technology
  - Wessells: Crime and Security, pp 125–148. (C)
  - Security and Reliability. In *Computerization and Controversy*: pp 410–652. (S)

- Philosophical foundations of morality and ethics and its applications to engineering problems
  - M W Martin and R Schinzinger. *Ethics in Engineering.* McGraw-Hill, New York, 1989: Moral Reasoning, pp 24–42, 51–60. (C)

- – Ethical Perspectives and Professional Responsibilities. In *Computerization and Controversy*: pp 654–742. (S)
- – T A Winograd. In *Computerization and Controversy*: Strategic Computing Research and the Universities, pp 705–716. (S)
- – C Barus. In *Computerization and Controversy*: Military Influence on the Electrical Engineering Curriculum since World War II, pp 717–727. (F)

- Thirty-six Discussion Cases in item 1. of *Engineering Ethics Cases Section of the Ethics Center for Engineering & Science*: http://web.mit.edu/ethics/www/engcases.html. (C)
  - – Public Safety and Welfare:
    - * Suspected Hazardous Waste.
    - * Clean Air Standards and a Government Engineer.
    - * The Responsibility for Safety and the Obligation to Preserve Client Confidentiality.
    - * Code Violations with Safety Implications.
    - * Whistleblowing City Engineer.
    - * Safety Considerations and Request for Additional Engineering Personnel.
    - * Engineer's Dispute With Client Over Design.
    - * Do Engineers Have a Right to Protest Shoddy Work and Cost Overruns?
    - * Change of Statement of Qualifications for a Public Project.
    - * Knowledge of Damaging Information.
  - – Conflicting Interests and Conflict of Interest:
    - * Engineering Student Serving as Consultant to University.
    - * Furnishing Limited Advice.
    - * Conflict of Interest Feasibility Study.
    - * Gift-Complimentary Seminar Registration.
    - * Engineer's Disclosure of Potential Conflict of Interest.
    - * Related Services for Private Party Following Public Employment.
    - * Commission Payment Under Marketing Agreement.
    - * Contingency Payment for Industrial Design.
  - – Ethical Engineering/Fair Trade:
    - * Copycat Cases.
    - * Using Disadvantaged Firms Regardless of Work Quality.
    - * Withdrawal of an Employment Offer.
    - * Public Criticism of Safety.
    - * Signing off on Drawings.
    - * Intellectual Property of Engineers in Private Practice.
    - * Raising the Issue of Participation in a Professional Society.
    - * Participation of an Engineer with Competing Firms for the Same Contract.
    - * Protest of a Low Fee Proposal.
    - * Change of Statement of Qualifications for a Public Project.
    - * Competition from Former Employees.
    - * Maintaining Professional Standards: Writing a Letter of Recommendation.
    - * The Use of Work from An Unpaid Consultation.
    - * Promotional Letter Emphasizing Negative Attributes of Other Firms.
  - – International Engineering Ethics:
    - * Commission Payment Under Marketing Agreement.
    - * Gifts to Foreign Officials.
  - – Research Ethics:
    - * Joint Authorship of Paper.
    - * Data Selection, Legitimate or Illegitimate?
    - * Credit for Engineering Work Design Competition.
    - * Credit for Engineering Work Research Data.

- Selected World Wide Web Resources

  - Ethics Center for Engineering and Science (MIT): http://web.mit.edu/ethics/www/. (F)

  - IEEE Society on Social Implications of Technology (SSIT):
    http://www4.ncsu.edu/unity/users/j/jherkert/index.html. (F)

  - International Network of Engineers and Scientists for Global Responsibility:
    http://cac.psu.edu/ duf/social/ines.html. (F)

  - W J Mitchell. *City of Bits: Space, Place and the Infobahn.* MIT Press, Cambridge, Massachusetts,
    1996. WWW version: http://www-mitpress.mit.edu/City_ of_ Bits/index.html. (F)

  - *TechNation ... Americans & Technology.* Transcripts of a radio program hosted by Moira Gunn
    and produced at the studios of KQED in San Francisco by MogoTech Media:
    http://ftp.sterling.com/talk-radio/TechNation/technation.html. (F)

  - An example term paper might be found at:
    http://www.ee.washington.edu/conselec/CE/sp95reports/espinosa/body1.htm. (F)

- Selected journals and magazines

  - Popular articles frequently appear in magazines such as *Scientific American, Time,* and *The
    Economist. The Guide to Periodical Literature* indexes such magazines, and may be used to find
    appropriate articles for general readers. A direct computer-based keyword search from journal
    databases and citation indexes may also be useful. (R)

  - IEEE Technology and Society magazine. (R)

  - Impact of Science on Society. (R)

  - Science and Society. (R)

  - Science, Technology and Human Value. (R)

  - Technology and Culture. (R)

  - Technology in Society. (R)

  - Technology Review. (R)