

William Paterson University of New Jersey
Department of Computer Science
College of Science and Health
Course Outline

1. TITLE OF COURSE AND COURSE NUMBER: Computer Science Seminar, CS480
Credits: 3

2. DESCRIPTION OF THE COURSE: This is the capstone course required of all CS majors. The course is conducted in seminar form featuring internal as well as external speakers. Approximately two thirds of the course covers current topics of interest in computer science and computing technology; the remaining one third of the course is dedicated to social impact of computers and ethical issues faced by today's computer professionals. Students are required to select a relevant topic and complete a substantial research-oriented project either individually or as a team. At the end of the project, students are expected to submit a substantial written report and orally present it to the public.

3. COURSE PREREQUISITES: CS senior standing

4. COURSE OBJECTIVES:

To gain in-depth understanding of the social impact of computers.

To articulate and practice the code of ethics for computer professionals

To develop research skills including utilization of library and the Internet resources.

To further critical thinking skills and to offer objective assessment the presentations of others.

To understand the constantly evolving nature of the field and the importance of staying current as a lifelong pursuit.

To provide a platform for a rigorous overall assessment of student in terms of the five student learning outcomes of the university described in the following section.

5. STUDENT LEARNING OUTCOMES:

Upon completion of the course, students will be able to:

a) Articulate the impact of computers on our society in key areas including privacy, security, benefits and risks of computers, right of intellectual property and software piracy, the two sides of software ownership and the patent law, consequences of the artificial intelligence, the balance between censorship and freedom of speech in

- cyberspace, the monopolizing and controlling information by small number of corporations. Measure: exams, surveys, and projects.
- b) Gain a deeper and more systematic understanding of scientific/research methods by carrying out a substantial research-oriented project on a current topic of interest in computer science. Measure: assignments and projects.
 - c) Explain the trends in information technologies and computer science.
 - d) Describe the responsibilities of expected of a computer professional and understand the code of ethics of computer professionals stipulated by computer professional organizations such as IEEE and ACM. Measure: exams, surveys, and projects.

By conducting the course in seminar form covering a wide range of topics and by requiring students to carry out a substantial research, the course reinforces the assessment of all five major learning outcomes of student identified by the university:

- a) Effectively express themselves in written and oral form. Measure: exams and projects.
- b) Demonstrate ability to think critically. Measure: exams and projects.
- c) Locate and use information. Measure: exams, surveys, and projects.
- d) Demonstrate ability to integrate knowledge and idea in a coherent and meaningful manner. Measure: exams and projects.
- e) Work effectively with others. Measure: projects.

Writing Intensive slos from UCC

W1-W3. The student should be able to write a 12 page paper on their senior project, which could be on a current research topic in a journal like an encryption or a data compression algorithm. They are encouraged to do a large programming project for the senior project that might have grown out of one of their courses especially software engineering or it might be a game or an application for the Iphone or Android. If their project is a programming project, the paper might document the steps they took to create the program or document the program so it can be used by another person. The paper will be corrected by the professor and they will be asked to revise it.

It should be emphasized that English 110 and communications 110 are prerequisites for the course. They must also give an oral report which gives the instructor another opportunity to see if the student really understands the material before the final submission of the written report and to make suggestions.

W1- The students should be able to write 10 short essays for the computer ethics segment of the course on such topics as privacy vs. freedom of expression, what they would include in a lecture on protecting computers from computer crime, the ways one can safeguard intellectual property, what they would do if pressured to release a buggy code, the benefits and disadvantages of outsourcing, etc. The topics of these essays are designed to stimulate critical thinking. Again students must also give oral presentations.

W3- Since this is a course in ethics, the student must use proper citations. When students lift material for their presentations from our ethics book or from the web they are publicly criticized and reminded that this is an ethics course as well as a senior project class.

Early in the semester students are asked to write an abstract of one of the presentations given by faculty members and these are graded and edited. They are also instructed in how to use a typesetting language to help them write equations, label equations, figures, and graphs so they can be referred to later and develop a bibliography and a method for citing references when the list of references might be growing.

The Slos for writing are evaluated through the 10 ethics assignments and the final paper.

Technology Intensive slos from UCC

T1 All students must be able to do a senior project that can either involve researching a current topic in the journals, like a web crawling algorithm, or a large programming project that might be a game or might have grown out of their data base or software engineering course. Lately students have been creating applications for the Android and Iphone. One part of the course delves into a topic that is the choice of the professor. Currently the topic is data fitting and has included lectures in medical imaging, data mining techniques, least squares fitting through Matlab, and fitting exponential functions with multiple data sets.

T2. They currently must also show competency in Latex, a typesetting language.

T3-T4. For the third of the course on ethics for the computer professional, the students must be able to give presentations and write essays on privacy, freedom of expression, different forms of computer crime and protection from these crimes. They must be able distinguish between what is legal and what is ethical in the workplace and discuss the legal means of protecting intellectual property. They must understand their responsibility to produce products that work as advertised, and how technology has changed the lives of people in developing countries.

The Slos for technology are evaluated through the final project, the homework exercises in the computer science topic chosen by the professor, the 10 homework ethics assignments, the final exam, and the 2 oral presentations.

6. TOPICAL OUTLINE OF TBE COURSE CONTENT:

Part I: Topics on ethics of computer professionals and social impact of computers

Topic 1: ACM and IEEE code of ethics for computer professionals

Topic 2: Freedom of speech versus censorship in cyberspace

Topic 3: Privacy: controlling and potential misuse of information

Topic 4: Intellectual property: the implication of copyrights, and patent laws

Topic 5: Computer crime and the culture of the hackers

Topic 6: Risks of large computer systems

Part II: Topics of current interest in computer science and new development in computing technologies

7. GUIDELINES/SUGGESTIONS FOR TEACHING METHODS AND STUDENT LEARNING ACTIVITIES:

- a) Lectures and group discussions led by students on social impact of computers and ethics and responsibilities of computer professionals.
- b) Seminar by guest speakers on current topics of interest in computer science and new development of computing technologies.
- c) Extensive reading assignments

8. GUIDELINES/SUGGESTIONS FOR METHODS OF STUDENT ASSESSMENT (STUDENT LEARNING OUTCOMES):

- a) Attendance and classroom participation
- b) Group discussions led by students
- c) Written and oral presentation of a substantial research-oriented project
- d) Essays assignments on social impact of computers and ethics and responsibilities of computer professionals.
- e) Inputs from students who are required to critique the presentations of their peers.

9. SUGGESTED READINGS. TEXTS, OBJECTS OF STUDY:

Reynolds, George, Ethics in Information Technology, Third Edition, Thomson, Course Technology , 2010

10. BIBLIOGRAPHY OF SUPPORTIVE TEXTS AND OTHER MATERIALS:

Halbert, T., and Ingulli, E., 2004, CyberEthics; 2nd edition, South-Western College/West.

Spinello, R.A., 2004, Readings in CyberEthics, 2nd Edition : Morality and Law in Cyberspace, Jones and Bartlett Publishers.

Tavani; H.T., 2010, Ethics and Technology: Ethical Issues in an Age of Information and Communication Technology, Wiley.

Bynum, T. W., and Rogerson , S. (Editors), 2003, Computer Ethics and Professional Responsibility: Introductory Text and Readings, Blackwell Publishers.

Ermann, M. and Shauf , M.S., (Editors), 2002, Computers, Ethics, and Society; 3rd edition, Oxford University Press.

Spinello, R.A., 2010, CyberEthics :Morality and Law in Cyberspace, 4th Edition Jones and Bartlett Publishers.

Johnson, D., 2009, Computers Ethics,4th edition, Oxford University Press.

Agre, P. and Rotenberg, M., 1998, Technology and Privacy: The New Landscape, The MIT Press, Cambridge, MA

Diffie, W. and Landau, S. 2010; Privacy on the Line: The Policies of Wiretapping and Encryption, The MIT Press, Cambridge, MA

Stone, A. 1998; The War of Desire and Technology at the Close of the Mechanical Age, The MIT Press, Cambridge, MA

Stefik, M. and Cerf, V. 1997; Archetypes, Myths, and Metaphors: The Internet Dreams, The MIT Press, Cambridge, MA

Kahin, B and Wilson, E. 1997; National Infrastructure Initiatives: Vision and Policy Design, The MIT Press, Cambridge, MA

Dowler, L. 1997; Gateway to Knowledge: The Role of Academic Libraries in Teaching, Learning, and Research, The MIT Press, Cambridge, MA

Baase, S. 2008; A Gift of Fire: Social, Legal, and Ethical Issues in Computing, Third Edition
Prentice Hall, Upper Saddle River, NJ

Ludlow, P. 1996; High Noon on the Electronic Frontier: Conceptual Issues in Cyberspace, The MIT Press, Cambridge, MA

Kahin, B. and Keller, J., 1995; Public Access to the Internet, The MIT Press, Cambridge, MA

Stamatellos 2007, G. Computer Ethics: A Global Perspective,

Journals:

Communications, a monthly journal published by ACM

Computer, a monthly journal published by IEEE Computer Society

IEEE Annals of the History of Computing, a quarterly journal by IEEE

IEEE Transactions of various topics

ACM Transactions of various topics

11. PREPARER'S NAME AND DATE: Dr. Erh-Wen Hu
12. ORIGINAL DEPARTMENTAL APPROVAL DATE: Spring, 1997
13. REVISORS'S NAME AND DATE: Dr. E. Hu; Spring 2005, and previously Spring 2000
14. DEPARTMENTAL REVISION APPROVAL DATE: Spring 2005.

