Syllabus
19-101, The Computer: Technical and Policy Issues

Professors Mark Kieler and Jon M. Peha
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Technology plays an important role in shaping our lives and our social institutions. At the same time, policies created by these social institutions play an increasingly central role in the evolution and implementation of technology. This course demonstrates the interplay between technology and public policy by exploring several diverse issues related to one of the most influential inventions of our time: the computer. The course begins by presenting the fundamentals of the computer. Then, the following policy issues will be explored in the context of computers: environmental impact, dependability, information protection. With each issue, students will study both the technical basis of the problem and the implications for policy-makers.

In this course, you will learn about the fundamentals of computing. You will see how technology influences policy making, and how policy influences technology development. You will gain experience with representative policy decisions, such as determining when government should get involved in an issue, and selecting among common forms of intervention. This includes a basic understanding of economic markets, and market failures. You will also learn to use some common analytic tools used to make these decisions, such as cost-benefit analysis, and risk assessment. You learn how computers affect the environment, and tools such as life-cycle analysis and design-for-environment that help reduce that impact. You will learn the fundamentals of computer dependability, see how computer use is associated with risk of casualties and property damage. You will see how engineers and policy-makers may address these issues. You will learn the basics of encryption, which can be used to protect information from unwanted viewers, and for checking the identity of unknown parties. These basic building blocks are central to many issues of privacy and security, and will play an important role in electronic commerce.

Personnel

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Course Secretary:
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Meeting times:

Class: Monday and Wednesday, 1:30 to 2:30, PH125C
Recitation: Friday, 1:30 to 3:20
Section A: SH 212
Section B: BH 237B

Corequisite or Prerequisite:

Computer Skills Workshop, and Calculus 1.

Upperclassmen

19-101 is designed primarily for freshmen. Upperclassmen are permitted to take the course, but they will be held to a higher standard in final grading.

Subjects

The class will be organized into four modules

1. **Background**: fundamentals of the computer and computer networks. Basic procedures of policy analysis, and determining where government intervention is appropriate.
2. **Environment**: the environmental impact of computers, computer design strategies, policy options.
3. **Dependability**: societal dependence on computers, computer dependability, legal implications and policy options.
4. **Information protection**: encryption, privacy, security, intellectual property, electronic commerce, policy implications.

Readings

Laudon, Traver, Laudon, ``Information Technology: Concepts and Issues"
Additional readings available for purchase, and on reserve at E&S library.

Other Handouts

Hand-outs that are passed out in class will be available in a file cabinet across the hall from HH A305. If they run out, you can ask the course secretary to make more copies.

Grading:

20% First Exam
20% Second Exam
20% Third Exam
30% Policy analysis project
10% Problem Sets

Late policy:

Homeworks will usually be due at the beginning of recitation on Friday, and will not be accepted late. No excuses. This will enable us to discuss homework solutions earlier. Each student can fail to turn in one homework without penalty. For those handing in all homeworks, the lowest score will be dropped.

Individual Responsibility:

Except where we explicitly tell you otherwise, we assume that all course work represents the student's own work.

- You are always welcome to discuss concepts in this course with other students.
- On the homeworks, you are allowed to discuss problems and issues with other students. However, when you write up your answers, you must work alone, and without copying from another source. You must also indicate at the top of the homework whom you discussed the homework with.
- On the project, you are expected to collaborate with your partner. You may exchange references to good information sources with students other than your partner. You may discuss the general topic with others. However, you and your partner must do all of the writing yourself, without help from others. You also may not take material from any other source unless it is referenced and quoted as appropriate.
- Every element of a test must be entirely your own work.

Violators of this policy risk serious penalties, which could include a reduction in the grade for 19-101, a failing grade for 19-101, suspension from CMU, or even expulsion. If you are at all unsure whether you are allowed to work with others, ask the professors or a TA. For further information on expected standards of conduct, please see the Student Handbook.

Class web site:

Class announcements, ranging from homework problem clarifications to classroom and schedule changes, will be announced on the class web site.
The URL is **courseinfo.web.cmu.edu/courses/S01-19-101**
You are expected to check regularly.

Contacting TAs and Faculty

Office hours will be posted on the web site. You are always welcome to speak to TAs and professors after class, or to schedule an appointment, or to simply come by our offices and look for us. We are here to help. Email is also a good way to reach us.