Introduction

1. What this course offers
2. How it delivers
3. What is information technology?
4. Sources of ideas about society
5. Course plan

1. What this course offers

• We seek to create an environment to collaboratively investigate the topic
• We offer
  – some questions for inquiry;
  – some information to support the inquiry;
  – ways to show learning results
  – an invitation to construct your knowledge
• What do you need to know about the ways information technology affects you, as a member of society?
Discussion

1. Are we too dependent on technology?
2. Can we keep our privacy?
3. How freely can we share songs and videos?
4. How reliable is information technology?
5. How do social networks like Facebook bring us together, and how do they place us at risk?

Discussion

6. How could information technology change your life for better or worse in the next twenty years?

What are two instances or results of information technology that you see as

7. a problem for you personally?
8. a benefit for you personally?
9. a problem for you socially?
10. a benefit for you socially?
Why study IT and society?

- We all use IT as workers, consumers, citizens, family members, students
- We are all affected by changes in information technology
- Social change drives changes in technology
- Technological change raises ethical and legal issues such as privacy, intellectual property
- What social and technological changes have you seen?
- Is the structure of society changing?

Catalog course description

This course explores
- the impact of computing and information technology on society
- how social factors have shaped the uses of IT

We will discuss
- the networked information economy and globalization,
- changes in work life and culture, and
- topics such as free expression, intellectual property, privacy, and security
**Perspectives for this course**

- _Several disciplines_ are used: computer science, sociology, law, ethics, government, economics, history
- _Example_: technical factors raise new privacy, free-expression, and intellectual-property issues
- _Textbook point of view_: IT brings social benefits _and_ problems; _trade-offs_ and _ways to solve problems_ are worth study

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**Mutual influences**

IT makes possible more social centralization and decentralization; new mathematical ideas enabled creation of IT

Our ideas are shaped by our social experience and our experience with IT; new ways of thinking have social consequences

Business needs and industrial-scientific advances created IT; IT changes social relationships and raises new ethical and legal problems
2. How the course will deliver

- Prerequisites: HS-level knowledge of computers, reading, writing
- Textbook and other required readings
- Contacting instructor
- Classroom format
- Group work and individual presentations
- Research paper
- Grading

Classroom format

- Point of view: students construct their own knowledge, critically and self-reflectively
- A classroom for active, collaborative learning
- Emphasis is discussion and interaction
- Slides support main concepts and points
- Participation matters
- Quizzes are frequent
What happens in all my courses

• For each topic, we have presentations, group work, discussion, assignments, and quizzes
• We investigate problems together, including
  – in small groups
  – in blackboard work
  – report backs from each student
• Grades are based on *contribution* and on *attainment of learning objectives* as shown by problem-solving quiz results – best of three tries
• Semester project brings together topics
• See paper, “What we do in my classroom”

A classroom session

1. Questions
2. I briefly present one subtopic, with slides
3. We discuss out-of-class exercises and solutions to some sample problems
4. *Either*
   – Problem solving in small groups, *or*
   – Student blackboard work, report-backs, and presentations
A proposed agreement

My commitments:
• Know the course material and present it clearly
• Return submitted work within a week
• Answer questions in a helpful way

Your commitments:
• Ask questions
• Answer reasonable questions, risking being wrong
• Submit work on time, even if incomplete
• Work sometimes in groups
• Present results to the class, at the blackboard

Both: respect all contributions to discussion

Classroom routine

• Slides and presentation summarize course content
• We will ask each other questions
• Individuals and small groups will investigate problems
• We will all share what we find out, including by students presenting at the whiteboard
• Quizzes and make-ups are frequent
Some forms of participation

- Asking questions
- Contributing ideas and facts
- Taking quizzes
- Submitting out-of-class exercises
- Telling class about own results
- Answering questions
- Participating in group work

Experiment: rotating facilitator

- Students volunteer for up to a week, sharing the role if they wish
- Tasks:
  - Help communication among all
  - Help all move forward
  - Help prof know student concerns
  - Help other students understand expectations and materials
- Tools: Discussion Board, email list
Classroom guidelines

Limited democracy; full academic freedom

- Mutual respect
- Mutual support
- Staying on topic
- Time limits on speaking
- One conversation
- Putdown-free, horseplay-free, offensive-language-free classroom
- Coming and going OK, non-disruptively, non-distractively

Assessment and grading tools

- Topic problem-solving quizzes
- Multiple-choice quizzes
- Final exam
- Out-of-class exercises
- Record of group activity
- Research paper
- Presentations
**Grades and assessment**

- *Out-of-class exercises* apply knowledge
- *Research paper* reports on your own inquiry
- *Quizzes* show factual knowledge and achievement of objectives
- *Attaining topic objectives* counts for 45% of grade
- Two make-up opportunities per objective; maximum score attained is recorded

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**Hands-on work and discussion**

*We will*

- Use the Internet in class
- Explore cooperative editing of documents by work groups
- Use discussion board, Wiki tools, and real-time collaboration tools
- Discuss the effects of technologies on our lives
Assessment and grading

- **To measure:**
  - Individual achievement of learning objectives
  - Contribution to the learning of the class
- **Breakdown:** 60/40
- **Assumptions:** Learning is *shared* and *measurable*

Assessment of learning objectives

**Assumptions:**

- **Application of concepts** is measurable via *core* and *other* topic objectives
- **Facts about concepts** matter
- We learn by *summarizing* and *reflecting*
Assessment of contribution and participation

We assume that learning happens by:

• Doing and sharing inquiry
• Just being here
• Groups solving problems
• Activity throughout the semester

This classroom as a network

• Consider how the people in this classroom interact electronically
• Are all interactions academic?
• That is a slice of the Internet
• Is there a hierarchy here?
• What are other interactions among people in this classroom?
• What is the infrastructure?
A proposed agreement

My commitments:
• know the course material well and present it clearly
• return submitted work within a week.
• answer questions

Your commitments:
• ask questions
• answer reasonable questions, risking being wrong
• submit work on time, even if incomplete
• work sometimes in groups
• present results to the class.

Both: respect all contributions to classroom discussion

Multi-topic objectives

0a. Do written exercises throughout semester
0b. Solve a problem as part of a team
0c. Present a short talk in the classroom
0d. Summarize and reflect on the semester’s work
0e. Write a documented research paper
0f. Support opinions with evidence
0g. Acknowledge counter arguments
0h. Document sources used
0i. Apply ethical principles to problems of IT in society
3. What is Information technology?

- What does IT mean to you?
- What forms of IT do you use every day?
- Is IT about *computers only*, or does it include some of the study of *life*?

## Defining IT

- Today, *information technology* is hardware and software that processes or communicates symbolic data in *digital* form
- *Information* may be defined as *data and its meaning*
- *Data* takes the form of sequences of symbols
- *Technology*: (innovative) tools
**IT Includes:**

- Data processing, mechanical or electronic
- Silicon-based micro-electronics
- Electronic computing with stored programs
- Telecommunications and broadcasting
- Opto-electronics, devices that work with light
- Genetic engineering based on the molecular symbols in DNA

**Information technology**

- “The set of techniques used in information handling and retrieval of information automatically” (Evans et al)
- “Application of appropriate technologies to the organization, manipulation, and distribution of information by computers and telecommunications” (G. Stamatellos)
- Digital tools for processing data (Keil et al)
Introduction

Features of IT

• Relentless changes and paradigm shifts
• Ubiquity: Computation becomes part of every task and device
• Exponential rise in computing power
• Connectivity of all people and devices
• Convergence of media (wireless Internet, cell phones, media players)
• Interchangeability of information

Technical change raises social and legal issues

• This course discusses many cases of this
• Our concerns are both the technical developments and the social results
• Examples:
  – Ease of copying and communicating data raises issues of file sharing
  – Social networking enabled young people in the Mideast to change their countries
Course theme: What Is the effect of the Internet?

• The Internet involves people, not primarily things, today
• Is the Internet
  – an infrastructure for social relationships?
  – a set of people?
  – a set of relationships?

Example of effect of technical change: Intellectual property

Changes:
• Enhancement of storage media
• Regularity of storage standards
• Speed of digital transmission
• Interoperability of media

Key technical facts: the nature of intellectual objects differs from that of physical ones, and digital media can store any intellectual object
The malleability of Information

• Computer technology has enabled malleability of information; the ability of all to reshape it
• This creates new possibilities for human activity
• The information revolution is not only technological but social and ethical
• Thesis: “Many new activities made possible by the new technology are so different from the previous ways of doing things that we need a new set of rules of the game.” (Baase, p. 26)

Computer science the IT discipline

• The theoretical and empirical study of computers and transformations of data
• Contributes to cognitive science; bioinformatics; complex systems
• Subfield, information technology, studies tools of information and data management
• Includes a part of mathematics, discrete
• First U.S. curriculum: 1968
4. Sources of some ideas about society

- What does “society” mean to you?
- How are resources distributed?
- What is good?
- What good behaviors so we want to make compulsory?
- How are compulsory rules decided?
- Can we learn from the past?

Related disciplines

- Sociology
- Economics
- Ethics
- Law
- Government
- History
Sociology

• “The scientific study of human social relations or group life…. Sociologists examine the ways in which social structures and institutions – such as class, family, community and power – and social problems – such as crime and abuse – influence society” (Encarta, 2005)

• Social interaction: “the response of individuals to each other”

What is society?

• What is your answer?

• Distinguish from:
  – Groups
  – Communities
  – Organizations
  – Systems
  – Countries
Economics

• A social science concerned with choices about **scarce resources**
• *Microeconomics* studies individual decision making
• *Macroeconomics* studies global phenomena such as growth, inflation, unemployment

Ethics

• A branch of philosophy concerned with **standards** for right and wrong human actions
• *Philosophy*: the critical examination of foundations for beliefs and action
• Theories of ethics:
  – Consequentialism (actions’ values depend on results)
  – Deontological ethics (actions have intrinsic moral qualities)
The Internet has created new ethical challenges

- *Globalization*, enabled by IT, has changed economic relationships
- *Communication* is instant, cheaper, is worldwide in scope
- *Environment* is interactive
- The Internet enables *anonymous* communication
- New ways exist to reproduce information

Is IT value neutral?

- If IT were seen as *value neutral*, it would be considered just an instrument of values, such as order, freedom, or the quest for knowledge
- Some people view IT is enabling *human freedom* by giving more people access to each other and to expressing themselves
- Some view IT as enabling *corporate or governmental power* by placing communication resources at their disposal
Law

• Concerned with the mandatory practices and rules of conduct in a community

• Varieties:
  – Criminal
  – Civil
  – Constitutional
  – Procedural

• Our interest: What laws do changes in IT make necessary?

Political science (government)

• A social science that studies government, states, and related decision making

• Origins of the field: Plato, Aristotle, Saint-Simon, Comte

• Contributors to U.S. ideas: J. Locke, T. Hobbes, T. Jefferson

• Our interest: What are appropriate government policies concerning IT?
History

- The study of the past and of changes that have occurred
- *Our perspective*: we are studying, in part, changes that occur in society under the influence of technological change.
- *Questions:*
  - How has IT changed society in the past 40 years?
  - How did previous technological revolutions change society?

5. Course topics

*Topics:*
1. Technical background
2. Social, ethical, and legal background
3. Security and privacy
4. Freedom of expression
5. Intellectual property and IT
6. Work, education, and culture
7. Risks, professional ethics, and evaluation of IT
8. Network structures and the global economy
Core topic objectives

1. Explain basic principles of computing: hardware, systems, applications, networking, and the Internet

2. Describe social/economic forces that have driven the information revolution, technological factors that have generated social issues, and relevant theories of ethics

3. Explain security and privacy issues raised by IT, referring to values, theories, and solutions

4. Discuss trade-offs between conflicting legitimate concerns about freedom of expression generated by technological changes

5. Explain intellectual property rights and how the informational society has created and addressed social and legal issues in this area.

6. Explain how changes in IT influence work, education, and culture

7. Describe human and system risks related to IT and ways to manage them ethically today and in the future

8. Explain how IT enables less centralized structures and new business models that operate via multiple information flows
**Topic 1 (Technical background)**

1. Why do computers exist?
2. How do they work?
3. What applications do college students and professionals need to know about?
4. What are the major *technical changes* in computing that affect us as members of society?

**Topic 2 (Social, ethical, economic background)**

1. How do we allocate ethical importance to individual and to society? What are your rights in relation to IT?
2. What are the effects of universal connectedness, ubiquity of computing, and the speed and low cost of processing, storage, copying, and communication of information?
3. Does today’s IT embody *values* from the social environment; or is it neutral and *value free*?
T2 inquiry

4. Have IT and globalization decreased or increased social polarization?
5. Does information technology, acting on itself, accelerate the rate of social change?
6. Has IT enabled a global economy?
7. Is the world “flat” and is that good?
8. Does connectedness of all people via IT raise social issues and enable changes in society?

Topic 3: Security and privacy

1. Does our society balance the priorities of security and privacy well?
2. Is privacy about power?
3. Do IT-enabled security and privacy intrusions assert power over individuals?
4. Do privacy safeguards protect the power of individuals?
5. Is privacy dead?
**Topic 4: Free expression**

1. Do computer systems widen freedom of expression, or limit and constrain it?
2. Does the *global information infrastructure* embody democratic values?
3. Is IT used well to support free expression?

**Topic 5: Intellectual property**

1. Can creators survive if their works are distributed for free?
2. Does the direct sharing of media outpace efforts to enforce the rights of creators?
3. Does current law sufficiently protect legitimate intellectual-property rights?
4. Does current law go too far?


**Topic 6: Work, education, and culture**

Does the information revolution result in
1. individualization of work;
2. increased fragmentation of society;
3. increased social connectedness and cohesion;
4. radical changes in education;
5. radical changes in our culture?

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**Topic 7: Risks in IT systems**

1. Is the reliability of software today at an advanced or primitive stage?
2. Could computer systems be much better than the ones we have?
3. What are the *ethical* responsibilities of people whose work is with technology?
Introduction

**Topic 8: Network structures**

1. In shaping our world, are we *enabled* by the ubiquity of computing and the connectivity of people?
2. Does the IT revolution make possible *centralization* or *decentralization* of power and production, or both?
3. Is IT associated with a new non-hierarchical organizational logic?

**References**


