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CSCI 120: Intro to Information Technology

Summary

1. Inquiry
2. Themes and concepts

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1. Inquiry

- What is computing?

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Inquiry

- What is the most exciting new development in computing in the first half of 2012?
- What are the coolest features of MS Word and PowerPoint?
- What is the main principle that enables productivity in text formatting?
- Why are spreadsheet skills required for economics and business majors?
- What is the main principle of spreadsheets?

Inquiry

- What is worth knowing about databases?
- What is the principle for organizing data?
- What unites all information storage?
- Does a computer work like a brain?
- Why does my phone boot quickly and my laptop boot slowly?
- Why is the network often down?
- How can I connect better online with my friends?
- What principles enable communication worldwide?

Inquiry

- Why does almost everyone either hate or love programming?
- Why does software not work?
- What steps and what tools enable building computer solutions efficiently?
- How will IT affect me and everyone I know, in our personal and work lives?
- How does IT affect the rate of social change?

2. Themes and concepts

- silicon vs. neurons
- global control of formatting
- nonlinearity of text
- absolute vs. relative referencing
- linking vs. embedding
- virtuality
- metadata
- hierarchy
- storage/retrieval
- analytical thinking and abstraction

Abstraction

- A big theme in the course, because computers manipulate abstract symbols
- “To abstract is to remove the basic concept, idea, or process from a situation” (L. Snyder)
- *Goal*: to identify the *relevant* facts
- *Related*: finding patterns and generalizations about them
- What is computing? (Instructor point of view: Computing is *either* transforming data to data, or else *interaction*.)

Languages used in IT

<u>Topic</u>	<u>Kind of language</u>	<u>Example</u>
1	Application interface	MS Word, PPT
	Markup	HTML
2	Formula (algebra)	Excel formulas
3	Query language	DB query
4	Machine	Intel microprocessor
5	Network protocol	HTTP, FTP, TCP/IP
6	Design	flowcharts, UML
	Procedural	JavaScript

Multi-topic objectives

- 0a. Participate in class activities throughout the semester
- 0b. Solve a problem as part of a team
- 0c. Present a short talk in the classroom
- 0d. Write a short documented research paper
- 0e. Explain and use metadata

3. Course topics

1. Formatting text and graphics
2. Spreadsheets and decision support
3. Introduction to database management
4. Hardware and operating systems
5. Networks and the Internet
6. Problem solving and procedural programming
7. IT and society

Summary

Topic 1: Formatting text and graphics

- 1a. Distinguish operating-system from application software
- 1b. Describe the hierarchical file system concept
- 1c. Recognize and use the basic terminology of text formatting and presentation software
- 1d. Explain and use global control of formatting
- 1e. Format text
- 1f. Use and explain hyperlinks
- 1g. Import and export data

Topic 2: Spreadsheets and decision support

- 2a. Explain and use spreadsheet formulas
- 2b. Explain and use relative and absolute referencing
- 2c. Explain and use named functions in a spreadsheet
- 2d. Explain and use spreadsheet formatting
- 2e. Explain the uses of spreadsheets in business

Topic 3: Introduction to database management

- 3a. Group, extract, summarize and display tabular data by value
- 3b. Design a relational database
- 3c. Design simple database queries
- 3d. Recognize or use simple database concepts

Topic 4: Hardware and operating systems

- 4a. Recognize and use the basic terminology of computer hardware
- 4b. Manipulate binary numerals and describe their applications
- 4c. Describe what an assembler or machine-language program does

Topic 5: Networks and the Internet

- 5a. Use and explain the basic terminology of computer networking and the Internet
- 5b. Distinguish locally stored data from data stored on a server
- 5c. Discuss network security issues
- 5d. Use technology that supports collaboration
- 5e. Evaluate online information

Topic 6: Problem solving and procedural programming

- 6a. Identify the steps in system development
- 6b. Explain the notion of an algorithm
- 6c. Trace a looping and branching computation specified in a flowchart
- 6d. Write a looping flowchart or pseudocode
- 6e. Write branching and looping code in a procedural language
- 6f. Explain the concept of debugging
- 6g. Create a simple event-driven web page

Topic 7: IT and society

- 7a. Explain how technological changes have given rise to new social and professional issues
- 7b. Explain economic and social factors in the IT revolution