

# CSCI 120: Introduction to Information Technology

Prof. David Keil, Spring 2012, Framingham State University

## SYLLABUS

### Invitation

What is the most exciting new development in mobile phones or social networking in the first half of 2012? We don't know now, but we may know by mid-semester. Join us to find out.

Help us investigate what makes hardware and software tick, and how we can use browsers, word processors, spreadsheets, and databases to explore our world and support our decisions.

### Course description (FSC catalog)

An overview of computer concepts and Information Technology (IT). Applications of IT in various disciplines are illustrated and the role of information technology in contemporary society, including issues of intellectual property, ethics, privacy and security is discussed. Students are introduced to windowed environments, file management, problem-solving tools and a high-level programming language. Advanced concepts of word processing, spreadsheets, and presentation software required for effective communication, analysis, and design are explored.

### Contacting me

I'd like students to visit or communicate about any course-related topic.

*Office hours* (Hemenway Hall 318A):

M 12:30-1:30 p.m., W 10:30-11:20 a.m.,

Tue. 4:00-4:30 p.m.; F 1:30-2:20 p.m.

Others by appointment

*Telephone:* (508) 626-4724

*Email:* [dkeil@framingham.edu](mailto:dkeil@framingham.edu)

*URL:* [framingham.edu/~dkeil/iit-matls.htm](http://framingham.edu/~dkeil/iit-matls.htm)

### Meeting times

Tue., Thur., 4:30-6:20

Hemenway Hall G01 (ground floor)

### Prerequisites

I expect that you have used a computer before and that you have high-school-level knowledge of reading, writing, and mathematics.

Mass. Department of Education guidelines recommended that all high school graduates possess basic skills using computers and standard software applications. We assume those.

### Strongly recommended reading

A. Evans, K. Martin, M. A. Poatsy. *Go! Technology in Action*, 7<sup>th</sup> ed. Prentice Hall, 2010.

I like our text because it's easily read, packed with up-to-date details, and well illustrated.

### Course overview

Using the notion of *fluency with information technology* as our framework, we will study computer technology from the point of view of a skilled user who intends to understand information technology in context and to be prepared to learn new technology as it emerges. This includes operating systems, hardware, networks, Internet computing, an introduction to system development, and social implications of information technology.

Standard office software includes applications for information formatting and web-page design, decision support (spreadsheets), and database management. A semester project will demonstrate your knowledge of the applications.

The social and professional issues addressed include computer ethics, intellectual property, and privacy. We aim for the student to be prepared for lifelong learning in information technology.

The goals of this course include *changing the way you think* about IT and *raising your level of knowledge and skills* in some applications and with related concepts. The course offers an environment in which to *build a new way of understanding IT*.

Some topics in this course are united by common *themes*, including the emergence of a *digital* world, social implications of technology; the need for everyone to have debugging skills; integrity of information; features of silicon technology; analytical and algorithmic thinking; global control of formatting; nonlinearity of text; absolute vs. relative referencing; linking vs. embedding; and virtuality.

### 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 are the main principles that support productivity in text formatting and in spreadsheets?
- Why are spreadsheet skills required for economics and business majors?
- What is the main principle of spreadsheets?
- 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 with friends online?
- What principles enable communication worldwide?
- 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?
- What is computing?

### Course objectives

By the end of the semester, successful students will be able to do the following:

- 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. Demonstrate understanding of metadata\*
- 0f. Communicate and support an idea in a formatted, well-designed report\*
- 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. Format text in diverse ways\*
- 1e. Explain or use global control of formatting
- 1f. Explain or use HTML formatting
- 1g. Import and export data
- 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 features\*
- 2e. Explain the uses of spreadsheets in business\*
- 3a. Recognize or use simple database concepts\*
- 3b. Design a relational database using entity-relationship concepts
- 3c. Design simple database queries\*
- 3d. Group and summarize data to show patterns, using pivot tables\*
- 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
- 4d. Distinguish digital from analog representations of information\*
- 5a. Recognize or use basic terminology of computer networking\*
- 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\*
- 5f. Explain or use hyperlinks
- 5g. Recognize or use basic terminology of the Internet
- 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
- 7a. Explain how technological changes have given rise to new social and legal issues\*
- 7b. Explain economic changes enabled by the IT revolution
- 7c. Defend a viewpoint about an ethical issue raised by IT, affecting privacy, freedom of expression, or intellectual property\*

\*Core objectives

Most objectives are assessed by quiz questions. Students are invited to set their own objectives.

### Fluency with information technology

Lawrence Snyder asserts that students “do not need rudimentary instruction in double-clicking and resizing windows. Rather, they need to be taught to be confident, in-control users of IT. They need to know how to navigate independently in the ever-changing worlds of information and technology, to solve their problems on their own, and to be capable of fully applying the power of IT tools in the service of their personal and career goals. They must be more than literate; they must be fluent with IT” (*Fluency with Information Technology*, Addison Wesley, 2004). This course invites you to *learn to learn*.

Fluency with IT includes “*skills, concepts and capabilities*.” Examples are the *skill* of using a work processor to format a table, the *concept* of a stored-program computer, and the *capability* to fix problems in a poorly designed collection of data. Objectives of FIT are to enable efficient use of computers and to prepare the student for lifelong learning in IT.

### Classroom format, quizzes, and grades

Please see the paper, “What we do in my classroom,” attached, which is part of this course’s syllabus. See especially guidelines there for assignments, grading, and collaboration. The following is a summary of that document.

Our classroom environment emphasizes active learning and governed by respect and support among all participants. Learning is a busy, often collaborative process of the learner constructing knowledge, so participation by all is at the center of my classroom. I ask questions and I expect students to ask questions. We keep in step but acknowledge different paces of learning.

My objectives for each course are listed in the syllabi. Grades are based on attainment of these objectives.

For each topic, we have presentations, discussion, assignments, and quizzes. I score each item of work submitted or each grading criterion on a scale of 0 to 1.0. Students will have multiple opportunities in the semester to show attainment of each objective, and the highest level of attainment will be recorded as a score for the objective. The entire semester grade is computed from numbers showing attainment of these objectives.

### Semester grading weights

The following categories group course objectives and outcomes (see previous page), which are assessed by means of assignments, quizzes, exams, and records of classroom discussion and presentations.

Application of capabilities and knowledge	
core objectives	25
other objectives	25
Knowledge of concepts and facts	15
Independent inquiry	10
Presenting results in person	10
Participation	<u>15</u>
	100 %

### Tutoring

Tutors who are eager to help IIT students are available via the Computer Science Department and CASA.

### Accommodations

“Students with disabilities who request accommodations are to provide Documentation Confirmation from the Office of Academic Support within the first two weeks of class. Academic Support is located in the Center for Academic Support and Advising (CASA). Please call (508) 626-4906 if you have questions or if you need to schedule an appointment.” (See [www.framingham.edu/CASA/Accommodations/accomm.htm](http://www.framingham.edu/CASA/Accommodations/accomm.htm).)

## Course Plan

<b>Dates</b>	<b>Topic</b>	<b>Required readings (Evans et al)</b>
1/19-1/24	<i>Introduction</i>	Ch. 1
1/26-2/2	1. Applications for formatting text and graphics	Ch. 4, 5; handouts <sup>1,2,3,4</sup>
2/2-2/14	2. Spreadsheets and decision support	Pp. 168-170; handout <sup>5</sup>
2/14	<i>Research proposals</i>	
2/16-2/23	3. Database management	Ch. 11; handouts <sup>6,7,8</sup>
2/21	<i>Problem-solving quizzes on topics 1-2</i>	
2/28-3/6	4. Computer hardware and operating systems	Pp. 36-47; Chs. 2, 6, 9; handouts <sup>9,10</sup>
3/6	<i>Research preliminary draft reports</i>	
3/8-3/28	5. Networked computing and the Internet	Chs. 3, 7, 8, 12, 13
3/20	<i>Problem-solving quizzes on topics 3-4</i>	
3/29-4/10	6. Problem solving and procedural programming	Ch. 10; handout <sup>11,12</sup>
4/10	<i>Make-up quizzes on topics 1-4</i>	
4/12-4/24	7. IT and society	Pp. 144-163; handouts
4/17	<i>Problem-solving quizzes on topics 5-6</i>	
4/24	<i>Research final draft reports</i>	
4/26-5/3	Summary and review	
5/1	<i>Problem-solving quiz on topic 7</i>	
5/4	<i>Final exam (problems)</i>	
Tue., 5/8, 3:00-6:00pm	<i>Final exam (mult-choice); optional activities</i>	

Rev. 1/15/12

<sup>1</sup> D. Keil, "Text formatting concepts"

<sup>2</sup> \_\_\_\_\_, "The MS Office 2007 Interface, components, and features"

<sup>3</sup> \_\_\_\_\_, "Text formatting and HTML reference"

<sup>4</sup> \_\_\_\_\_, "HTML table tags"

<sup>5</sup> \_\_\_\_\_, "Spreadsheet concepts"

<sup>6</sup> \_\_\_\_\_, "Entity-relationship design for databases"

<sup>7</sup> \_\_\_\_\_, "Pivot tables and data analysis"

<sup>8</sup> C. Breuning, "Excel database commands"

<sup>9</sup> D. Keil, "The binary numeral system"

<sup>10</sup> \_\_\_\_\_, "A model processor"

<sup>11</sup> \_\_\_\_\_, "Problem solving and system design"

<sup>12</sup> \_\_\_\_\_, "Command-driven, event-driven, and web-based software"