

Syllabus

version 1.0

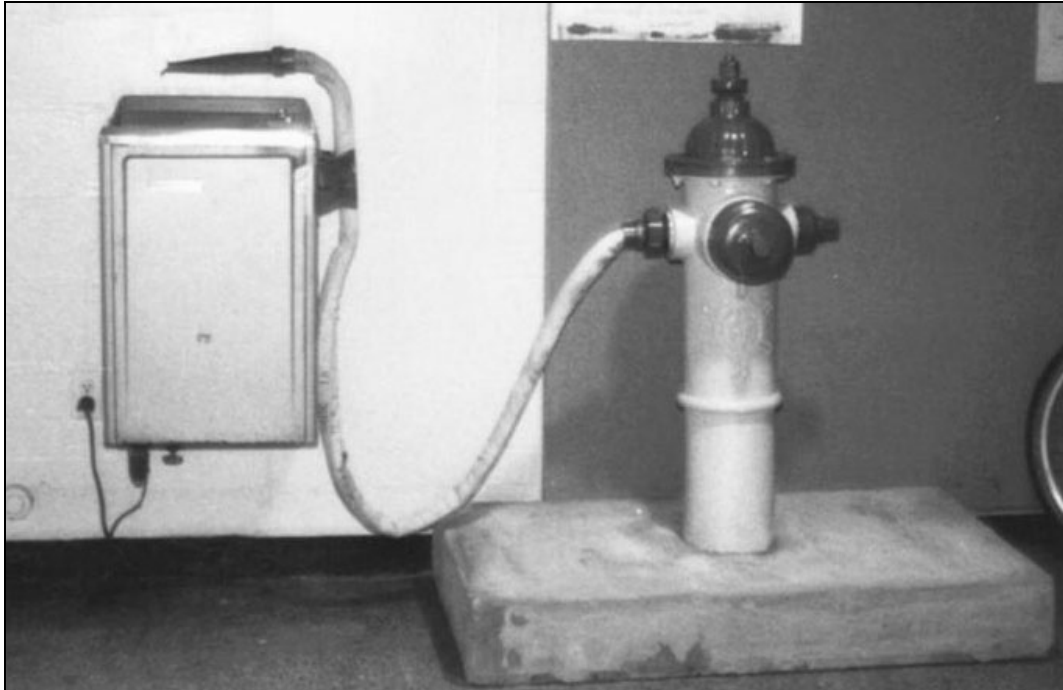
Instructors

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Description

This course is all about understanding: understanding what's going on inside your computer when you flip on the switch, why tech support has you constantly rebooting your computer, how everything you do on the Internet can be watched by others, and how your computer can become infected with a worm just by being turned on. Designed for students who use computers and the Internet every day but don't fully understand how it all works, this course fills in the gaps. Through lectures on hardware, software, the Internet, multimedia, security, privacy, website development, programming, and more, this course "takes the hood off" of computers and the Internet so that students understand how it all works and why. Through discussions of current events, students are exposed also to the latest technologies.



http://hacks.mit.edu/Hacks/by_year/1991/fire_hydrant/

Expectations

You are expected to attend all lectures, complete nine problem sets, take two exams, and produce a final project.

Grades

Your final grade will be determined as follows.

Problem Sets	50%
Exam 1	20%
Exam 2	20%
Final Project	10%

Website

The address of this course's website is:

<http://www.computerscience1.org/>

Visit this site to read course-wide announcements, watch videos of lectures, download handouts and software, and follow links to other resources.

Staff

To contact the entire staff, email the address below.

staff@computerscience1.org

Contact information for individual members of the staff can be found on the course's website.

Books

No books are required for this course.

However, we do recommend that you procure a set of four books; we offer you a choice of two such sets. A schedule of recommended readings from each set is provided in this document's discussion of lectures.

The first set is designed for those who would describe themselves as less comfortable with computers and the Internet. The second set is designed for those who would describe themselves as more comfortable with computers the Internet. Both sets cover much of the course's material; the second set, however, provides additional technical detail which may appeal to students eager for additional challenge.

Each of the books in these sets is available for purchase either at the Harvard Coop, located in Harvard Square at 1400 Massachusetts Avenue, or at such sites as Amazon.com.

Set One: for Those Less Comfortable

Computers Are Your Future, Complete, Ninth Edition
Bill Daley
Prentice Hall, Inc., 2007
ISBN 0-13-242939-X

How the Internet Works, Eighth Edition
Preston Gralla
Que Publishing, 2006
ISBN 0-7897-3626-8

How to Use HTML and XHTML
Gary Rebholz
Sams Publishing, 2001
ISBN 0-672-32031-2

Teach Yourself VISUALLY Computers, Fifth Edition
Paul McFedries
John Wiley & Sons, Inc., 2007
ISBN 0-4701-6878-1

Set Two: for Those More Comfortable

Computers Are Your Future, Complete, Ninth Edition
Bill Daley
Prentice Hall, Inc., 2007
ISBN 0-13-242939-X

How Computers Work, Ninth Edition
Ron White
Que Publishing, 2007
ISBN 0-7897-3613-6

How the Internet Works, Eighth Edition
Preston Gralla
Que Publishing, 2006
ISBN 0-7897-3626-8

HTML, XHTML & CSS: Visual QuickStart Guide, Sixth Edition
Elizabeth Castro
Peachpit Press, 2006
ISBN 0-3214-3084-0

Grossman Library

Each of this course's recommended books has been placed on reserve in Grossman Library, located in Sever Hall 311; the books may not be checked out.

A schedule of hours appears at the address below.

<http://www.extension.harvard.edu/2008-09/resources/libraries.jsp>

Lectures

Lectures will take place in Northwest Science B101 on most Mondays from 7:35 P.M. until 9:35 P.M..

With the exception of Lectures 3 and 11, each lecture will be recorded, digitized, and made available within 72 hours via podcast (for download to iTunes and iPods) and via the course's website in Flash, MP3, and QuickTime formats. Once posted, these recordings will remain available until semester's end. You are welcome to watch or listen to a recording if you are unable to attend some lecture in person. You are encouraged to watch or listen to these recordings for the sake of review.

A schedule of lectures appears below.

Lecture 1: Hardware

Monday, 15 September 2008

Computation. Overview. Bits and bytes. ASCII. Processors. Motherboards: buses, connectors, ports, slots, and sockets. Memory: ROM, RAM, and cache.

Lecture 2: Hardware, Continued

Monday, 22 September 2008

Secondary storage: floppy disks, hard disks (PATA and SATA), CDs, and DVDs. Virtual Memory. Expansion buses and cards: AGP, ISA, PCI, PCI Express, and SCSI. I/O devices. Peripherals. How to shop for a computer. History.

Lecture 3: Software

Monday, 29 September 2008

It's the first of two movie nights for Computer Science E-1! A look at "how modern day visionaries Bill Gates and Steve Jobs changed the world" by way of *Pirates of Silicon Valley*, a dramatization of the history of Microsoft Corporation and Apple Computer, Inc.

Lecture 4: The Interweb

Monday, 6 October 2008

Networks: clients and servers, peer-to-peer, LANs and WLANs, the Internet, and domains. Email: addresses; IMAP, POP and SMTP; netiquette; spam; emoticons; snail mail; and listservs. SSH. The World Wide Web: URLs and HTTP. Blogs. Instant messaging. SFTP. Usenet.

Lecture 5: The Interweb, Continued

Monday, 20 October 2008

Network topologies. The Internet: backbones, TCP/IP, DHCP, and DNS. NAT. Ethernet: NICs, cabling, switches, routers, and access points. Wireless: IR, RF, Bluetooth, and WiFi. ISPs. Modems: dialup, cable, and DSL.

Lecture 6: Multimedia

Monday, 3 November 2008

Graphics: file formats, bitmaps and vectors, and compression. Audio: file formats and compression. Video (and audio): file formats and compression. Streaming.

Lecture 7: Security

Monday, 10 November 2008

Threats to privacy: cookies, forms, logs, and data recovery. Security risks: packet sniffing, passwords, phishing, hacking, viruses and worms, spyware, and zombies. Piracy: WaReZ and cracking.

Lecture 8: Security, Continued

Monday, 17 November 2008

Defenses: scrubbing, firewalls, proxy servers, VPNs, cryptography, virus scanners, product registration and activation.

Lecture 9: Website Development

Monday, 24 November 2008

Web servers: structure, permissions, and implementations. Static webpages: XHTML, well-formedness, and validity. Dynamic webpages: SSIs, DHTML, AJAX, CGI, ASPs, and JSPs.

Lecture 10: Programming

Monday, 8 December 2008

Pseudocode. Constructs: instructions, variables, conditions, branches, and loops. Languages: interpreted and compiled. Scratch.

Lecture 11: Startups

Monday, 5 January 2009

It's the second of two movie nights for Computer Science E-1! A look at the rise and fall of the dotcom era by way of *Startup.com*, a documentary that traces the history of govWorks.com.

Lecture 12: Exciting Conclusion

Monday, 12 January 2009

Where were you? Where are you? Where can you go?

Sections

Sections provide opportunities to review recent lectures' material in a more intimate environment with only a teaching fellows and a handful of classmates present. Sections also provide guidance on problem sets.

A schedule of sections appears on the course's website.

Problem Sets

Problem sets will be distributed most weeks and be due via email two or more weeks later. Extensions for problem sets will not be granted, except in cases of emergency. Technical difficulties will not constitute emergencies. Problem sets submitted n hours late without extension will be penalized 5% for n in $(0, 24]$, 10% for n in $(24, 48]$, 25% for n in $(48, 72]$, 50% for n in $(72, 96]$, or 100% for n greater than 96. Lateness will be determined by emails' timestamps.

When computing your final grade, we will drop your lowest score. Be aware that many questions in problem sets will require Internet access and one problem set will require a trip to a computer store local to you.

A schedule of problem sets appears below.

Problem Set 1: O, Hai!

Distributed: Monday, 22 September 2008

Due: Monday, 6 October 2008, 7:35 P.M.

Problem Set 2: Hardware and Software

Distributed: Monday, 29 September 2008

Due: Monday, 13 October 2008, 7:35 P.M.

Problem Set 3: Teh Interwebs

Distributed: Monday, 6 October 2008

Due: Monday, 20 October 2008, by 7:35 P.M.

Problem Set 4: Hardware, Software, and teh Tubes

Distributed: Monday, 20 October 2008

Due: Monday, 3 November 2008, by 7:35 P.M.

Problem Set 5: Multimedia

Distributed: Monday, 3 November 2008

Due: Monday, 17 November 2008, by 7:35 P.M.

Problem Set 6: Security

Distributed: Monday, 10 November 2008

Due: Monday, 24 November 2008, by 7:35 P.M.

Problem Set 7: Website Development

Distributed: Monday, 24 November 2008

Due: Monday, 8 December 2008, by 7:35 P.M.

Problem Set 8: Programming

Distributed: Monday, 8 December 2008

Due: Monday, 5 January 2009, by 7:35 P.M.

Problem Set 9: kthxbai

Distributed: Monday, 5 January 2009

Due: Monday, 12 January 2009, by 7:35 P.M.

Exams

This course will have two exams. The first exam will take place in lieu of lecture on Monday, 27 October 2008, and will cover Lecture 1 through Lecture 5. The second exam will take place in lieu of lecture on Monday, 15 December 2008, and will cover Lecture 1 through Lecture 10 but will focus on material from Lecture 6 onward.

Final Project

The climax of this course is its final project, an opportunity to develop your very own website with your very own domain name. A proposal for your final project will be due by 7:35 P.M. on Monday, 8 December 2008. The website itself will be due by 7:35 P.M. on Monday, 12 January 2008. Extensions for the final project will not be granted, except in cases of emergency. Technical difficulties will not constitute emergencies.

Guidelines for the final project will be distributed by Monday, 24 November 2008.

Staff's Picks

Becoming a computer person (read: nerd) doesn't happen overnight. But certain movies can help. In fact, watch any of the staff's picks listed on the course's website in its entirety during this semester, write a review of at least 200 words, email your review to staff@computerscience1.org, and you'll earn five points of extra credit on the most recently due problem set! Be sure your review includes a thumb's up or down! And be sure to explain how the movie's content relates to E-1! You may watch as many of these picks as you wish during the term, but you may submit no more than one review per problem set. You are welcome to watch picks with other students, but each student must submit his or her own review. Look for these picks at your local library or video store, but don't forget such sites as Blockbuster.com and Netflix.com!

Academic Honesty

All work that you do toward fulfillment of this course's expectations must be your own. Viewing or copying another individual's work (even if left by a printer, stored in an executable directory, or accidentally shared in the course's classroom) or lifting material from a book, magazine, website, or other publication—even in part—and presenting it as your own constitutes academic dishonesty, as does showing or giving your work, even in part, to another student.

Similarly is dual submission academic dishonesty: you may not submit the same or similar work to this class that you have submitted or will submit to another. Similarly is submitting for extra credit a review of a pick that you have not watched in its entirety during this semester academic dishonesty.

You are welcome to discuss course material with others in order to better understand that material. However, you must do all problem sets, the exams, and the final project on your own. Contact the staff for help with a specific question on a problem set, an exam, or the final project.

All forms of academic dishonesty will be dealt with harshly.

Inclement Weather

In the event of inclement weather, you may call the Extension School's general information line at (617) 495-4024 or the Harvard University Newline at (617) 496-6397 to find out whether a class has been cancelled.

Alternatively, you may visit the course's website or the address below.

<http://www.extension.harvard.edu/>

Announcements will also be broadcast on local radio stations WKRO-AM (680 kHz), WBZ-AM (1030 kHz), WBUR-FM (90.9 MHz), and WCRB-FM (102.5 MHz) as well as on local television stations WBZ (channel 4), WCVB (channel 5), and WHDH (channel 7).

You are advised to consult more than one of these sources, lest one or more not be current.

Noncredit

If you are not taking this course for credit, you are not expected to submit problem sets, take the exams, or produce a final project. However, all of the work in this course is designed to facilitate your comprehension and retention of lecture materials. Consequently, you are encouraged to complete as much of the work as possible. In return, the staff will correct and comment on any work that you submit.