Computer Science Syllabi   NJIT Syllabi

Spring 2023

CS 485: Selected Topics In CS

Evan Koblentz

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Syllabus for existing CS-485, History of Computing

Welcome to CS-485, section 102.

Students will gain a comprehensive overview of the evolution of computing from the start of recorded history through modern times. By studying history, you will understand the context of modern developments in CS/IT, including cyclical trends and why various approaches did or did not work. Learning where it all came from will also help young computer scientists to speak intelligently with older colleagues and managers in the workforce. Topics include mechanical calculating, analog computing, relay/tube computers, transistors, integrated circuits, I/O such as punch cards/paper tape/floppy disks, the minicomputer generation, the microcomputer revolution, development of graphical and network systems, early mobile computer, and modern history. A special focus on historic developments in New Jersey will be part of all lectures.

About the instructor: Evan Koblentz (evank@njit.edu / https://web.njit.edu/~evank/) is a full-time writer in the NJIT communications office and an adjunct instructor in YWCC since the Spring 2022 semester. Before joining NJIT in 2019, Evan spent ~20 years writing for computer magazines and ~15 years leading Vintage Computer Federation, which is a 501(c)(3) organization that educates about the history of computing.

There are five simple rules in my class:

1. Pay attention. It is insulting to me and other students if you do homework for other classes, play games, chat online, etc. while you're here. If I hear typing, then I expect you're taking notes.
2. Speak up! I am happy when students ask smart questions.
3. Be civil. I encourage active debate about historical topics and how they impact current events. You may vehemently disagree with me or with other students, but keep it polite.
4. Don't use the F-word. No, not THAT one. I am talking about "first". This is a history course, so we'll learn about generations of computing. "First" is subjective and we will aim to avoid it at all costs.
5. Never cheat. It's unfair to yourself and your classmates. Cheating includes looking up answers online, using AI such as ChatGPT to write answers, sharing answers with other students, etc.

Grading is as follows: 35% final exam, 30% midterm short paper, 20% weekly quizzes, and 15% attendance.

The required book is "A new history of modern computing" (Haigh/Ceruzzi).

The schedule of lectures is as follows:

Week 1: Intro + Pre-history: Clay tablets, invention of number systems, abacus, quipu, Greek/Roman mechanical programming, Antikythera device, slide rule, Pascal, Babbage/Lovelace

Week 2: Giant brains: Boole, differential analyzers, Bush, relay computers (Bell Labs/Harvard), vacuum tubes, Colossus, ENIAC, National Bureau of Standards

Week 3: Commercial hardware: punch cards/IBM, UNIVAC, LEO, von Neumann

Week 4: Commercial programming: The women of ENIAC, COBOL (with modern demo), Fortran

Week 5: Transistors and integrated circuits: Edison effect (here in Newark!), Bell Labs, what else did transistors enable, MIT TX-0, MOBIDIC, Fieldata, Noyce/Kilby, Moore's Law

Week 6: Minicomputing/analog: DEC PDP/VAX, Boston 128 corridor, analog's role, C, Unix, timesharing Mauchly again, EAI, future role of analog computing in quantum

Week 7: No class (take-home midterm paper): ~1,000 words: any topic from start until last week, talk about the importance, what could have been different, compare it to something modern in computing

Week 8: Microcomputer revolution: RESISTORS, Amateur Computer Society, BASIC, People's Computer Club, Ted Nelson, Homebrew Computer Club vs. ACG-NJ, Mark-8, S-100 generation, Microsoft, Apple

Week 9: Mainstream microcomputing: The trinity: Apple II, Commodore PET 2001, Radio Shack TRS-80 Model 1, BASIC group project (can you make a program from nothing but some examples and reference books?)

Week 10: Networking: Hardware vs. applications — SAGE, ARPAnet/IMPs, BBN, NSFnet, Internet, Intel/DEC/Xerox make Ethernet; email, FTP, Archie, Veronica, Gopher, WAIS, WWW, modern 'apps'

Week 11: Becoming graphical: Bush's As We May Think, SRI's Mother of All Demos, Xerox PARC, Mac, The Humane Interface, Windows + underdogs (Amiga, etc.)

Week 12: Mobile: DYSEAC, MOBIDIC revisited, science fiction, Osborne, Compaq, laptops, Newton, Simon, etc.

Week 13: Modern history: EIES, early websites, cyclical (cloud vs. timesharing), NVRAM, vintage computing hobby

Week 14: Review

Week 15: Final exam (20 open-ended questions, taken in-class)