Course Outline
August 29, 2018


August 30,31: First Discussion Session. Bookkeeping, overview, expectations, Discussion of Programming Lab 0 (PL0)

September 3: No class, Labor Day

September 5: Lecture 2: Intro to Instruction Set Architecture, with examples taken from many diverse ISAs. ISA tradeoffs. Detailed discussion of LC-3b, with Assembly language constructs. The Assembler, how it works. PL1

September 6,7: Discussion Session: The ISA

Programming Lab 0 (PL0) is due, Sunday night, September 9, 11:59pm. (The program itself will be empty. The purpose of the assignment is to make sure we are on the same page re: using the system.)

September 10: Lecture 3: Microarchitecture, LC-3b data path, state machine, microsequencer.

September 12: Lecture 4: Microarchitecture (continued)

September 13,14: Discussion Session. ISA, microarchitecture, PL1.

Problem set 1 due before class, September 17. (Emphasis: ISA, uarch)

September 17: Lecture 5: Performance enhancement (Pipelining, Branch Prediction, The HEP)

September 19: No class: Work on PL1 and PS2.

September 20,21: Discussion session: Microarchitecture, Pipelining, Branch Prediction, PL1.

Programming Lab 1 is due, Sunday night, September 23, 11:59pm. (Write a program in LC-3b Assembly Language. Write an Assembler. Assemble the program you have written.)

Problem set 2 due before class, September 24. (Emphasis: ISA, uarch of the LC-3b, the Assembly Process)

September 24: Lecture 6: Performance enhancement (out-of-order execution)

September 26: Lecture 7: Physical memory, unaligned access, interleaving, SRAM, DRAM
September 27, 28: Discussion session: Tomasulo algorithm, Physical Memory, PL2.

Programming Lab 2 is due, Sunday night, September 30, 11:59pm. (Write a program in C that simulates at the instruction cycle level the baseline LC-3b ISA. Test your simulator with the output of the assembler for the application program written in Programming Lab 1.)

October 1: Lecture 8: Physical Memory (continued).

October 3: Lecture 9: The notion of Process, the unit of work managed by the Operating System, and its implications on Interrupts and Exceptions and Virtual memory.

October 4, 5: Discussion section: Prepare for midterm

Problem set 3 due before class, October 8

October 8: Lecture 10: Review or Catch up!

October 10: Lecture 11: Exam 1.

October 11, 12: Discussion session: Exam solution, PL3

October 15: Lecture 12: Virtual memory, page tables, tlb, VAX model, IA32 model, contrast with segmentation.

October 17: Lecture 13: Virtual memory, continued.

October 18, 19: Discussion Session. Emphasis on Virtual memory, PL3

Programming Lab 3 is due, Sunday night October 21, 11:59pm. (Finish the clock cycle level Simulator for the LC-3b. Test it on the application program written in Programming Lab 1.)

October 22: Lecture 14: Cache Memory

October 24: Lecture 15: Cache Memory, continued

October 25, 26: Discussion session: Cache Memory.

Problem set 4 due before class, October 29

October 29: Lecture 16: Input/Output.

October 31: Lecture 17: Input/Output, continued.

November 1, 2: Discussion session: I/O, PL4.

Note: November 1 is the last day to drop a class without Dean’s permission.

November 5: Lecture 18: Integer Arithmetic
November 7: Lecture 19: Floating point arithmetic and the IEEE Standard.

November 8, 9: Discussion session: Arithmetic, PL4

**Programming Lab 4 is due, Sunday night November 11, 11:59pm. (Interrupts/Exceptions)**


**Problem set 5 due before class, November 14 (I/O, Cache, arithmetic.)**

November 14: Lecture 21: Review or Catch up.

November 15, 16: Discussion session. Review for exam.


November 21: No class, university holiday, Thanksgiving.

November 22, 23: No discussion section, Thanksgiving.

November 26: Lecture 23: Single-thread parallelism, continued.

November 28: Lecture 24: Intro to Multiprocessing, Amdahl’s Law, Speed-up, efficiency.

November 29, 30: Discussion session: Parallelism, PL5

**Programming Lab 5 is due, Sunday night December 2, 11:59pm. (Virtual memory)**


December 5: Lecture 26: Pot Pourri: Introduction (reprise!), Measurements, RISC, Comments on the Future

December 6, 7: Discussion session: Review of the course, Prepare for Final, PL6

December 10: Lecture 27: Last class, free for all!

**Programming Lab 6 is due, Monday, December 10, 11:59 pm. (Pipelining)**

**Problem set 6. A study guide, not to be turned in.**

Final exam: Probably Friday, December 14, 7-10pm.

BUT: The registrar has the right to change the dates of the final exams. Please keep checking the Registrar’s web site and our announcements to be sure when/where the final exam will be given. You are expected to take the final exam whenever the Registrar schedules it.