

CSC 462/562 Schedule, Readings and Topics

We will meet one day per week in class. You are expected to also have an “out of class” session which will include readings, discussion board participation, working through sample problems, and then working on the homework assignment. The in class session will usually be on a Monday night (6-9 pm) but as noted below, there will be two class periods on Wednesday night. Your out of class session can take place when you desire as long as it takes place prior to the next class period. The instructor will arrange times over each weekend to be available for question answering and other interactive communication via blackboard (with the exception of the weekend of June 22-24). You should try to plan your out of class sessions around these times if possible to get quick feedback.

The schedule, readings and topics is tentative but assume it is correct unless announced otherwise.

You will have a homework assignment assigned every week. The assignment will be due at the beginning of the next class period. For instance, homework 1 will be due at the beginning of class on June 4, homework 2 will be due at the beginning of class on June 11. There is no homework assignment for the last week, instead there will be a take-home final. It will be due no later than noon on Thursday, July 19.

The schedule below lists readings for both in class and out of class. You might notice that we are going to be working through the text in an odd ordering. The order that items are listed below match the order reflected in the posted notes. I recommend that you try to read the material in the order listed, not in sequential order by page numbers.

Schedule

Week 1:

Meeting day: Wednesday, May 30

Readings: 1.8, 1.9, 1.11, appendix A, appendix C pages C-31 to C-34

Topics: CPU Performance, Instruction set introduction, MIPS instruction set and implementation

Out of class readings: 1.2, 1.3, 1.4, appendix K.1-K.2. If you are interested, also read K.3.

Out of class topics: Other RISC ISAs, Intel x86 ISA (if interested), sample problems from chapter 1 and appendix A

Week 2:

Meeting day: Monday, June 4 (homework 1 due)

Readings: C.1 – C.5 (excluding static and dynamic branch prediction, p. C-26 – C-30)

Topics: MIPS pipeline

Out of class readings: C.6

Out of class topics: MIPS R4000 pipeline, sample problems from pipelining

Week 3:

Meeting day: Monday, June 11 (homework 2 due)

Readings: C.7, 3.1 – 3.2, 3.4 – 3.5

Topics: dynamic scheduling with the scoreboard and register renaming/Tomasulo’s approach, re-examination of data and control dependencies, loop unrolling

Out of class readings: 3.5 continued (discussion on hazards), C.8
Out of class topics: close look at WAW and WAR hazards, sample problems

Week 4:

Meeting day: Monday, June 18 (homework 3 due)
Readings: 3.6 – 3.7, appendix C pages C-26 – C30, 3.3, 3.9, 3.8
Topics: Superscalar issue, branch prediction, speculation

Out of class readings: 3.12
Out of class topics: Thread level parallelism, sample problems

NOTE: I will be out of town from June 22 – June 25, I will make myself available via email and blackboard to answer questions on either Monday, June 25 in the evening or all day Tuesday, June 26.

Week 5:

Meeting day: Wednesday, June 27 (homework 4 due)
Readings: external readings assigned, 3.13, 5.8
Topics: 486, ARM Cortex A-8, Pentium IV (and III), Intel Core i7, multicore processors

Out of class reading: external readings assigned
Topics: Pentium I, Pro & II processors, sample problems

Week 6:

Meeting day: Monday, July 2 (homework 5 due)
Readings: Appendix H, 4.5
Topics: Other RISC approaches

Out of class readings: 3.10-3.11
Out of class topics: Limitations of instruction-level parallelism, sample problems

Week 7:

Meeting day: Monday, July 9 (homework 6 due)
Readings: 2.1, B.1 – B.3, 2.2
Topics: Cache optimizations

Out of class readings: 2.3, B.4 – B.5, 2.5 – 2.6
Out of class topics: Memory, virtual memory, memory hierarchy, sample problems

Week 8:

Meeting day: Monday, July 16 (homework 7 due)
Readings: 4.1 – 4.2, 5.1 – 5.2, 5.4
Topics: Vector processing, parallel processing

Out of class: final exam, due Thursday, July 19 by 12 noon.