

Computer Engineering 431  
Introduction to Computer Architecture  
Fall 2015

Tuesdays, Thursdays, 8:00-9:25am, 162 Willard Bldg

Course Outline

| L #        | Date           | Topic  | Reading      | HW        | Quiz |
|------------|----------------|--|--------------|-----------|------|
| 1x         | Aug 25         | Course introduction and overview                             | PH 1.1-1.5   | HW1       |      |
| 2x         | Aug 27         | Understanding performance                                    | PH 1.6-1.11  |           | Qz1  |
| 3x         | Sep 1          | MIPS ISA <b>review</b>                                       | PH 2         |           |      |
| 4x         | Sep 3          | MIPS arithmetic <b>review</b> ; floating point               | PH 3         | HW2       |      |
| 5x         | Sep 8          | MIPS single cycle datapath <b>review</b>                     | PH 4.1-4.4   |           | Qz2  |
| 6x         | Sep 10         | Pipelined datapaths, handling data hazards                   | PH 4.5-4.7   |           |      |
| 7x         | Sep 15         | Reducing branch hazard costs                                 | PH 4.8       | HW3       |      |
| 8x         | Sep 17         | Branch prediction; dealing with exceptions                   | PH 4.9       |           | Qz3  |
| 9x         | Sep 22         | Memory hierarchies; DRAMs; memory controllers and memory bus | PH 5.1-5.2   |           |      |
| 10x        | Sep 24         | Cache basics <b>review</b> , improving cache performance     | PH 5.3, 5.9  | (HW3)     |      |
| 11x        | Sep 29         | Virtual memory hardware support (TLB's)                      | PH 5.6-5.8   |           | (Q3) |
| 12x        | Oct 1          | VLIW datapaths   | PH 4.10      |           |      |
| 13x        | Oct 6          | Catch up; Exam 1 review                                      |              |           |      |
| <b>Ex1</b> | Tues<br>Oct 6  | Time: 8:15 – 10:15 p.m.<br>Location: 22 Deike                |              | HW4       |      |
| 14x        | Oct 8          | Exam 1 return  |              |           | Qz4  |
| 15x        | Oct 13         | Static SuperScalar (SS) datapaths                            | PH 4.10      |           |      |
| 16x        | <b>Oct 15</b>  | <b>Class cancelled, evening Exam 1 makeup</b>                |              |           |      |
| 17x        | Oct 20         | Static SS datapaths con't; FGMT                              | PH 6.4       | HW5       |      |
| 18x        | Oct 22         | Dynamic SS datapaths   | PH 4.10      |           | Qz5  |
| 19x        | Oct 27         | Dynamic SS datapaths con't; SMT                              | PH 6.4       |           |      |
| 20x        | Oct 29         | Storage architectures (disks, RAIDS, etc.)                   | PH 5.5, 5.11 |           |      |
| 21x        | Nov 3          | Shared memory multiprocessors                                | PH 6.1-6.3   | Project   | Qz6  |
| 22x        | Nov 5          | Multicore (multi)processors, cache coherence in multicores   | PH 6.5, 5.10 |           |      |
| 23x        | Nov 10         | Message passing multiprocessors, clusters                    | PH 6.7       |           |      |
| 24x        | Nov 12         | Multiprocessor networks, multicore NoCs                      | PH 6.8       |           | (Q6) |
| 25x        | Nov 17         | Catch up; Exam 2 review                                      |              |           |      |
| <b>Ex2</b> | Tues<br>Nov 17 | Time: 8:15 – 10:15 p.m.<br>Location: 22 Deike                |              |           |      |
| 26x        | <b>Nov 19</b>  | <b>Class cancelled, evening Exam 2 makeup</b>                |              |           |      |
|            | Dec 14         | Final project report due via Angel                           |              | (Project) |      |

x indicates a 85 minute (1 hour 25 minute class period)

30 x 75 minute classes ~ 26 x 85 minute classes