Electrical and Computer Engineering, Computer Science 250
Computer Architecture (Fall 2018)

Lectures
TuTh 11:45 – 1:00PM
Biological Sciences 111

Recitations
W 1:25PM-2:40PM, 3:05-4:20PM, 4:40PM-5:55PM

Faculty
Professor Benjamin Lee (benjamin.c.lee@duke.edu)
Office Hours: TuTh 2:00-3:00PM, Hudson 210

Graduate Teaching Assistants
Siddhartha Nalluri (siddhartha.nalluri@duke.edu)
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Head Undergraduate Teaching Assistant
Joseph DeChicchis (joseph.dechicchis@duke.edu)

Webpage
http://people.duke.edu/~bcl15/class/class_ece250fall18.html
See Sakai for homework assignments, lecture slides

Synopsis
Computer structure, machine language, instruction execution, addressing techniques, and digital representation of
data. Computer systems organization, logic design, microprogramming, and interpreters. Symbolic coding and
assembly systems. Prerequisite: Computer Science 201 or consent of instructor.

Text
(1) Patterson and Hennessy. Computer Organization and Design: The Hardware/Software Interface, 5th edition,
Morgan-Kaufmann. (2) Kernighan and Ritchie. The C Programming Language, 2nd edition (optional)

Assignments and Grading
This course will require readings from the textbook, problem sets, programming assignments, and digital logic
design. Grades are assigned based on homework (50%), midterm-1 (15%), midterm-2 (15%), final (20%). You are
expected to complete the homework individually unless otherwise stated. However, you may discuss topics
covered in the class. Late homework submissions incur a 10% penalty when <24 hours late, incur a 20% penalty
when 24-48 hours late, and receive no credit when >48 hours late.

Academic Integrity
The discussion of ideas and design strategies is an integral part of the learning experience. However, cheating and
plagiarism is not. Practically, you violate academic integrity when
(1) you obtain solutions and code from others, or
(2) you provide solutions and code to others.

The Duke Community Standard, will be strictly enforced with zero tolerance for cheating and/or plagiarism. If a
student is suspected of academic dishonesty (e.g., cheating on an exam, copying code, collaborating
inappropriately on an assignment), the instructor will report the matter to the Office of Student Conduct. A
student found responsible for academic dishonesty faces formal disciplinary action, which may include suspension.
A student twice suspended automatically faces a minimum 5-year separation from Duke University.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
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| Aug 27 | **Module 1**: Course Introduction and Overview  
              -- Introduction           | Chapter 1        |
|        | **Module 2**: Instruction Sets and Assembly Programming  
              -- C Programming          | Chapter 2        |
| Sep 3  | -- From C to Binary                  |                  |
| Sep 10 | -- Assembly Programming              |                  |
| Sep 17 | **Module 3**: Digital Logic Design   
              -- Sequential Logic, Finite State Machines | Appendix B      |
| Sep 24 | **Module 4**: Processor Design       
              -- Datapath, Control, Exceptions / Interrupts / Syscalls | Chapter 4.1 – 4.4 |
| Oct 1  | Midterm 1 (Oct 2)                    
              -- Fall Break            |                  |
| Oct 8  | **Module 5**: Memory                 
              -- Fall Break            
              -- Caches                | Chapter 5        |
| Oct 15 | -- Caches                            
              Fall Break              |                  |
| Oct 22 | -- Main Memory                       |                  |
| Oct 29 | -- Virtual Memory                    | Appendix A.8     |
|        | **Module 6**: I/O                     |                  |
| Nov 5  | Midterm 2 (Nov 6)                    |                  |
| Nov 12 | **Module 7**: Pipelined Cores        | Chapter 4.5 – end |
| Nov 19 | **Module 8**: Multi-core             
              -- Thanksgiving          | Chapter 6        |
| Nov 26 | Survey – Modern Processors           |                  |
| Dec 3  | Review for Final Exam                |                  |