

ECE 496: Introduction to Computer Architecture

Meeting Time & Location

TuTh 1:25 – 2:40PM, Hudson 208

Faculty

Professor Benjamin Lee
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Undergraduate Teaching Assistants

Oliver Fang (oliver.fang@duke.edu)
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Office Hours: TBD

Webpage

http://www.duke.edu/~BCL15/class_ece496spr13.html

Synopsis

The objective of this course is to learn how computers work, focusing on how hardware executes software. Topics include instruction sets, computer arithmetic, processor design, memory system design, and input/output. Teams of students will design and build a computer in real hardware and then run programs on it.

Pre-requisites

ECE52 and ability to program in a high-level language (e.g., C, C++, Java).

Text

Patterson and Hennessy. *Computer Organization and Design: The Hardware/Software Interface*, 4th edition, Morgan-Kaufmann.

Assignments and Grading

This course will require readings from the textbook, problem sets, programming assignments, and one multi-part project. Grades are assigned based on homework (20%), project (35%), midterm exam (20%), and final exam (25%).

Deadlines will be enforced except under extreme circumstances. Late submissions incur a 10% penalty per day. Students should consider turning in something not quite done on time rather than turning in something after the deadline. *Start assignments and projects early!*

Academic Policy

University policy, as codified by the Duke Undergraduate Honor Code, 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), faculty are required to 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.

	Topic	Reading
Jan 10	Overview / Introduction	Chapter 1
Jan 15 / 17	Instruction sets	Chapter 2
Jan 22 / 24	Instruction sets Instruction sets	
Jan 29 / 31	Computer arithmetic	Chapter 3
Feb 5 / 7	Computer arithmetic	
Feb 12 / 14	Processor design	Chapter 4.1 – 4.4
Feb 19 / 21	Pipelining (Prof. Sorin)	Chapter 4.5 – end
Feb 26 Feb 28	Pipelining / Review for Midterm (Prof. Sorin) Midterm	
Mar 5 / 7	No class	
Mar 12 / 14	Spring recess	
Mar 19 / 21	Memory systems	Chapter 5
Mar 26 / 28	Memory systems	
Apr 2 Apr 4	I/O Multicore	Chapter 6 Chapter 7
Apr 9 / 11	Multicore	
Apr 16 Apr 18	Advanced Topics Review for Final	TBD
Apr 23	Project Demos	
Apr 29	Exam week	

Project

The project for this class will be performed in pairs (teams of 2). It is comprised of multiple parts. The end product is a hardware prototype for a microprocessor and software that runs on this prototype. Parts of the project will be due throughout the semester. Details will be posted on the webpage.