ECE 341
Introduction to Computer Hardware

Instructor: Zeshan Chishti
zeshan@pdx.edu

Fall 2014
Portland State University
When and Where?

• **When:** Mondays and Wednesdays 4:40 - 6:30 PM
• **Where:** EB 103
• **Office hours:** Mondays & Wednesdays after class, or by appointment
• **TA:** Leela Kamalesh Yadlapalli ([leelak2@pdx.edu](mailto:leelak2@pdx.edu))
• **TA office hours:** Tuesday 1PM -- 2PM, Friday 5PM – 6PM in Tektronix Lab (FAB 60-01)
• **Webpage:** [http://ece.pdx.edu/~zeshan/ece341.htm](http://ece.pdx.edu/~zeshan/ece341.htm)
• Go to the course webpage for:
  – Class slides
  – Course syllabus and schedule
  – Grading policies
  – Homework assignments and solutions
Course Information


- **Expected background:** CS201 or equivalent
  - Basic knowledge of computer organization
  - Data representation in binary, decimal, and hexadecimal notation
  - Basic knowledge of instruction set architecture
  - Assembly language programming
Grading Policy

• Homeworks 35%
  – 8 homework assignments, top 7 chosen for each student to contribute towards the 35% weightage

• Midterm Exam 25%

• Final Exam 40%

• Grading scale (tentative):
  Ð A: 92-100%  A-: 87-91.5%
  Ð B+: 83-86.5%  B: 79-82.5%  B-: 75-78.5%
  Ð C+: 71-74.5%  C: 67-70.5%  C-: 63-66.5%
  Ð D+: 59-62.5%  D: 55-58.5%  D-: 50-54.5%
  Ð F: Below 50%
Other Policies

- All homeworks due in class. No extensions given
- Submit homework to the instructor soon after entering the class
- You can also submit homeworks via email before the start of class

- Midterm exam in class during week 6
  - Wednesday, November 5, 4:40 – 6:30 PM

- Final exam will cover entire course with more emphasis on material taught after the midterm exam
This course is about designing a computer in hardware

**End Goal:** To understand the hardware implementation of different components of a modern computer

Basic functional units of a computer

- Input
- Output
- I/O
- Memory
- Arithmetic and logic
- Control
- Processor
- Interconnection
Course Topics

- Digital logic – gates, flip flops, multiplexers, state machines
- Computer arithmetic
- Basic computer architecture – data path, control, and buses
- Pipelining hardware
- CISC vs RISC architectures
- Memory hierarchy and virtual memory
- Input/output techniques – polling, interrupts, and DMA