

CS 33: Computer Organization

Glenn Reinman
4731G Boelter Hall
reinman@cs.ucla.edu


Some notes adopted from Bryant and O'Hallaron

Course Components




Lectures

-  Higher level concepts

Discussions




-  Applied concepts, important tools and skills for labs, clarification of lectures, exam coverage

Labs

-  The heart of the course
-  Provide in-depth understanding of an aspect of systems
-  Programming and measurement


More Info

Web

-  Class web page hosted by CourseWeb
-  Copies of lectures, assignments, exams, solutions
-  Forum

Office Hours

Textbook

-  Randal E. Bryant and David R. O'Hallaron. "Computer Systems: A Programmer's Perspective", **3rd Edition**, Prentice Hall 2015.

Grading

🌀 Exams (55%)

- 🌀 Midterm (20% each)
- 🌀 Final (35%)
- 🌀 All exams are open book/open notes.

🌀 Labs (40%)

- 🌀 4 labs (10% each)
- 🌀 You must work alone on all labs

🌀 Homework (5%)

- 🌀 5 assignments (1% each)
- 🌀 Electronic submission only

Tentative Calendar

Week	Monday	Wednesday	Friday
1	Intro + Bits and Bytes (1,2)	Integers (2)	
2	Machine-Level Programming I: Basics	Machine-Level Programming II: Control	
3	Machine-Level Programming III: Procedures	Machine-Level Programming IV: Data	Data Lab Due
4	Machine-Level Programming V: Advanced Topics	Floating Point (2)	
5	MIDTERM	Program Optimization	Bomb Lab Due
6	The Memory Hierarchy	Cache Memories	
7	Concurrency (12+handouts)	Concurrency (12+handouts)	Buffer Lab Due
8	Linking + Exceptions (7,8)	Virtual Memory (9)	
9	I/O (10)	MIPS (handouts)	
10	Holiday!	Review	Parallel Lab Due

 **Homework and Labs Due via CourseWeb by Midnight**

Cheating

🌀 What is cheating?

- 🌀 Sharing code: either by copying, retyping, looking at, or supplying a copy of a file.

🌀 What is NOT cheating?





- 🌀 Helping others use systems or tools.
- 🌀 Helping others with high-level design issues.
- 🌀 Helping others debug their code.

🌀 Penalty for cheating:




- 🌀 At the discretion of the Associate Dean

Lab Facilities

SEAS Administered Linux Machine

-  `l nxsrv. seas. ucl a. edu`
-  Remote access only
 -  Use `ssh` to log in with your SEAS account
-  Please direct any account issues to the SEAS help desk as they are the only ones with root access on this machine

Alternatives (Not Recommended)

-  You may use other alternatives to develop your code
-  **BUT: We will test on the SEAS machines**
 -  **Your code must work correctly on these machines for credit**

Course Theme

- ⌚ **Abstraction is good, but don't forget reality!**

- ⌚ **Abstractions have limits**

 - ⌚ Things are more complex in hardware than they look in C/Java!!

 - ⌚ Bugs are hard to track/understand if looking only from a high-level point of view

- ⌚ **Useful outcomes**

 - ⌚ Become more effective programmers

 - ⌚ Able to find and eliminate bugs efficiently

 - ⌚ Able to tune program performance

 - ⌚ Prepare for later “systems” classes in CS

 - ⌚ Compilers, Operating Systems, Networks, Computer Architecture, Parallel Programming

The Compilation System

```
#include <stdio.h>
```

```
int main()
```

```
{
```

```
    printf("hello, world\n");
```

```
}
```

