Welcome!

COMS W4118
Operating Systems I
Spring 2015
Teaching staff

• Instructor
  – Jae Woo Lee (jae@cs.columbia.edu) – 715 CEPSR
  – Office hours
    • Jae’s calendar: http://bit.ly/jae-cal (will be filled by Friday)
    • First week only: this Friday, 3-4pm, or grab me after class

• Teaching Assistants
  – 8 TAs
    • Chae Jubb ecj2122@columbia.edu - Head TA
    • Esha Maharishi em2852@columbia.edu
    • Amelia Brunner arb2196@columbia.edu
    • Benjamin Barg bbb2123@columbia.edu
    • Derek Xingzhou He xh2187@columbia.edu
    • Ruchir Khaitan rk2660@columbia.edu
    • Sankalp Singayapally ss4728@columbia.edu
    • Alex Liu al3037@columbia.edu
  – Office hours TBA
    • TA room – see http://ta.cs.columbia.edu for map
Who am I?

• Jae Woo Lee
  – Lecturer in Computer Science
    • Teaching first, research second
  – Just call me Jae (pronounced ‘Jay’)

• My background
  – Undergrad in Columbia College
  – Many years of professional experience
    • Designing and coding large-scale software systems
    • Running a start-up company
  – Came back to Columbia for Ph.D.
Class is full.

As of last night:

- 164 max
- 178 enrolled
- 27 more in the wait list

Wait list is first come, first served
- Please don’t come to me with add/drop form

Today’s lecture:

10 Reasons Why You Should Drop This Class
Reason 1: It's Not You, It's Me...

• I’m not an OS researcher
  – In fact I don’t do much research at all these days
  – Interested in possibly joining OS research group?
  – Then take it with Prof. Jason Nieh or Prof. Junfeng Yang

• This is only my 2nd time teaching OS
  – Curriculum still in flux
  – Some lectures and homeworks will be made as we go

• In my defense, I’ve been told I’m a pretty good teacher
Reason 2: Actually It’s You

Come back when you have the prereqs:

1. **C**
   - Don’t even think about it if you don’t know C cold

2. **UNIX**
   - Must be comfortable at command line
   - Don’t take the course if you never worked on UNIX

3. **Computer architecture**
   - Basic hardware knowledge: register, cache, bus, etc.
   - Should be able to read simply assembly code: load, store, add, jmp, etc.

4. **Data structures**
   - Nothing fancy, but must be solid on the basics: list, tree, stack & queue

**Columbia courses:**
For 1 & 2:
- W3157 Advanced Programming

For 3:
- W3827 Fundamentals of Computer Systems

For 4:
- W3134, W3136, or W3137 Data Structures
Reason 3: The (OMG) Workload

This course has been two courses in one:

(1) OS theory typically taught in basic OS course
(2) Kernel hacking typically taught in advanced OS

Some complain it’s like a 6-credit course!

BTW I’m adding one more:

(3) Advanced UNIX programming
  • UNIX from the user level: process, thread, networking, concurrency, signals, non-blocking & async I/O, etc.
  • Much needed backdrop before delving into UNIX kernel
  • Also some system administration – become a Linux power user!
  • First 1/3 of the semester
Reason 4: Too Many Textbooks

1. **Operating System Concepts Essentials**
   - You can use "Operating System Concepts, 9th Ed” instead – OSCE2 is basically a cheaper version of OSC9

2. **Linux Kernel Development**

3. **Advanced Programming in the UNIX Environment**

Available now at Book Culture – 112 st, between Broadway & Amsterdam: [http://www.bookculture.com](http://www.bookculture.com)

Some of them might be on Safari books online: [http://www.columbia.edu/cu/lweb/eresources/databases/4136562.html](http://www.columbia.edu/cu/lweb/eresources/databases/4136562.html)
Reason 5: Too Many Emails

• 4118 ListServ
  – Communication between all of us
  – Official announcements, lecture notes, homework assignments
  – Open membership – auditors are welcome to subscribe

• Do:
  – Ask & answer questions – 1st place to go for non-personal questions
  – Provide helpful tips & links for your classmates
  – Be considerate & friendly

• Don’t:
  – Post your code
  – Provide critical info that leads directly to solution
  – Be impatient & rude

• Learn to manage high volume
  – [ANN] in subject for important announcements
  – Yes, I am aware of Piazza
Reason 6: Too Much Homework

• Uncertain at this point, but 5 - 10 assignments
  – Some are individual, some are group assignments
  – Some are short & light, some are long & heavy
  – Assignments carry different weights

• Random grading
  – Some assignments may not be graded
  – But you won’t know until after the deadline
  – HWs picked for grading will be 35% of your grade

• Late policy
  – 20% penalty after deadline up to 24 hours; zero afterwards

• Bottom line: keep up by reading & coding on a daily basis
Reason 7: 15 million lines of code

• “As of 2013, the Linux 3.10 release had 15,803,499 lines of code”
  – Learn to navigate a large code base
  – Learn to read code rather than documentations that are often vague, out-of-date, or flat-out wrong

• But you will probably encounter a large exiting code base wherever you get a job
Reason 8: Hard Exams

• People tell me I give hard exams...
  – Exams are closed-everything, no electronic device of any kind
  – Based on lectures and homeworks

• Exam schedule
  – Midterm exam – probably during the week before Spring break
  – Final exam – May 12th, 1:10-4:00

• Your overall grade
  – 35% HW, 30% Midterm, 35% Final
  – I reserve the right to boost one’s score by up to 5%
    • For class & listserv participation, exceptional work, etc.
    • Usually < 1% in order to bump up some borderline letter grades
Reason 9: No Cheating

• Don’t:
  – Copy code from friends (unless you’re supposed to, like group projects)
  – Copy code from the Internet
  – Look at solutions that your friend has from previous semesters

• We can tell
  – We know about the Internet too
  – Powerful cheating detection software (MOSS)
  – We look at not only your end result, but also your work history
    • Your submitted patch MUST contain at least 5 commits with meaningful logs

• Result of cheating
  – Zero tolerance, seriously.
  – Referral to academic committee & Dean’s office

• Columbia guidelines to academic honesty
  – http://www.cs.columbia.edu/education/honesty
Reason 10: Five Assignments on Day 1!

1. Subscribe to 4118 ListServ today
   - In the textbox labeled “Your name (optional)”, put Your Full Name (UNI)
     - For example, Jae Woo Lee (jwl3)
   - You must reply to confirm email (which might be in your spam folder)
   - Then receive “Welcome to the "Cs4118" mailing list”
     - This email contains your password for accessing archives of past postings

2. hw0: send me an email to introduce yourself
   - Subject: “[4118] hw0-UNI”
     - Without the quotes, sole space before hw0, UNI replaced with your actual UNI in lowercase
   - Your name, major & school program, year
   - Optionally anything else you want to let me know

3. Reading assignment
   - APUE: chapter 1, 2.3, 2.4
   - OSCE2/OSC9: 1.2, 1.4, 1.5, 1.8.3, 2.7, 2.10
   - LKD: chapter 1

4. HW1: setting up your own Linux virtual machine
   - First individual HW, due Wed, Jan 28, 11:59pm
   - Submission detail TBA

5. Start forming groups of 3
   - You are welcome to advertise yourself on the ListServ