Welcome!

COMS W4118

Operating Systems I

Spring 2016

Teaching staff

- 7 Teaching Assistants (TAs)
  - Chaiwen Chou cc3636@columbia.edu - Head TA
  - Emilia Pakulski enp2111@columbia.edu
  - Derek Xingzhou He xh2187@columbia.edu
  - Rohit Gurunath rg2997@columbia.edu
  - Akira Baruah akb2158@columbia.edu
  - Mitchell Gouzenko mag2272@columbia.edu
  - Amar Singh Dhingra asd2157@columbia.edu
- TA email & office hours
  - Email to cucs4118-tas@googlegroups.com goes to all teaching staff
  - TA room – 1st floor, Mudd building
  - TA calendar: http://bit.ly/4118-cal (will be filled by this weekend)
- Instructor email & office hours
  - Jae Woo Lee jae@cs.columbia.edu – 715 CEPSR
  - Jae's calendar: http://bit.ly/jae-cal (will be filled by Friday)
  - First week only: Wednesday, 3:30-5:30pm, or grab me after my classes

Who am I?

- Jae Woo Lee
  - Lecturer in Computer Science
    - Teaching first, research second
  - Just call me Jae (pronounced 'Jay')
    - Note that this is NOT a general rule – address instructors as Professors unless told otherwise
- 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.
  - More info at http://www.cs.columbia.edu/~jae/

Class is full.

As of last night:

- 150 max
- 151 enrolled
- 79 more in the wait list

Wait list is first come, first served

- Please don't come to me with add/drop form
- Exceptions require email from faculty

Today's lecture (same title for 3 years… ☹):

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 3rd 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**
   - 2nd Edition, 2013, Wiley – by Silberschatz, Galvin, Gagne
   - E-book available from the publisher: http://www.wiley.com/WileyCDA/WileyTitle/productCd-EHEP002902.html
   - You can use "Operating System Concepts, 9th Ed" instead – OSCE2 is basically a cheaper version of OSC9
2. **Linux Kernel Development**
   - 3rd Edition, 2010, Addison-Wesley – by Robert Love
3. **Advanced Programming in the UNIX Environment**
   - 3rd Edition, 2013, Addison-Wesley – by W. Richard Stevens, Stephen A. Rago

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

Some of them might be on Safari books online:
http://www.columbia.edu/cu/lweb/eresources/databases/4136562.html

Reason 5: Too Many Emails

- 4118 ListServ
  - Communication between all of us, including official announcements
  - Do:
    - Ask & answer questions – 1st place to go for non-personal questions
    - Provide helpful tips & links for your classmates
    - Be considerate & friendly
  - Don't:
    - Ask questions without first trying to solve it on your own
    - Post code or critical info that leads directly to solution
    - Be impatient & rude
- TAs and I respond to emails in this order:
  - ListServ, cucs4118-tas@googlegroups.com, then individual emails
  - NEVER send a same question separately to multiple people
    - You will get banned from ever sending emails if you get caught doing this.
- Learn to manage high volume
  - [ANN] in email subject for announcements – set up Gmail filter
  - Yes, I know about Piazza. Thanks for your suggestion.

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 33% of your grade
- Late policy
  - 20% penalty after deadline up to 24 hours; zero afterwards

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
- 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 assignments
- Exam schedule
  - Two in-class exams during the semester – dates TBA
  - No final exam
- Your overall grade
  - HW, Exam #1, Exam #2 – 33% each
  - I reserve the right to boost one's score by up to 5%
    - For class & listserv participation, exceptional work, etc.
    - Usually < 0.5% in order to bump up some borderline letter grades

Reason 9: Zero tolerance on cheating

- **REQURED READING:**
  http://www.cs.columbia.edu/~jae/honesty.html

- You are cheating if you:
  - Take code from friends, or search for code on the Internet
  - Look at solutions that your friend has from previous semester
  - Upload any class materials (including your own code) to public repository (ex. GitHub) during or after this semester
- We can tell
  - We know about the Internet too
  - You submit work history – minimum 5 commits required
- Result of cheating
  - Case 1: You get caught
    - Academic penalty – 1 letter grade down for mild cases; F for severe ones
    - Referral to the Office of Judicial Affairs
    - 38 people got caught in Fall 2015
  - Case 2: You get away with it
    - You will keep cheating for the rest of your life – have a nice life.

Reason 10: Six assignments on Day 1!

1. Subscribe to 4118 ListServ today
   - https://lists.cs.columbia.edu/mailman/listinfo/cs4118
   - In the textbox "Your name (optional)" put Your Full Name (UNI)
     - For example: Jae Woo Lee (jwl3)
   - **You must reply to the 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. Read the following two documents:
   - http://www.cs.columbia.edu/education/honesty
   - http://www.cs.columbia.edu/~jae/honesty.html
3. **HW0 (50 points) – due Thu, 1/21, 11:59pm**
4. **HW1 (100 points) – due Tue, 1/26, 11:59pm – will be posted by tonight**
5. Reading assignments
   - See http://www.cs.columbia.edu/~jae/4118/ for HW0, HW1, and reading assignments
6. Start forming groups of 3 – feel free to advertise on listserv