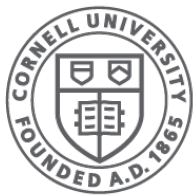


# Administrivia

CS 4410: Operating Systems  
Spring 2023

Professor Robbert van Renesse



**Cornell CIS**  
COMPUTING AND INFORMATION SCIENCE

[R. Agarwal, L. Alvisi, A. Bracy, M. George,  
F. B. Schneider, E. Sirer, R. Van Renesse]

新年快乐



# Inclusion

- We strive to make CS4410 a welcoming, safe, equitable, and respectful environment, consistent with [Cornell's commitments](#)
- We recognize that the society we live in is none of those things, that we have implicit biases, and that we have to work hard every day to counter those biases to create an inclusive environment
- If you witness a bias incident or have been the victim of one, please file a [confidential report](#) with Cornell
- If you have any suggestions such as improvements to the web site, syllabi, slides, homework and exam questions, and so on, you can email [cs4410-prof@cornell.edu](mailto:cs4410-prof@cornell.edu).

# Emotional Help

Cornell Health	<a href="https://health.cornell.edu/services/mental-health-care">https://health.cornell.edu/services/mental-health-care</a>	Cornell University Health Service
Student Disability Services	<a href="https://sds.cornell.edu">sds.cornell.edu</a>	Ensures that all aspects of student life are accessible, equitable, and inclusive of those with disabilities. Send accommodation letters to Veronica VanCleave-Seeley (vv48, Gates 401) by Sep 15.

Get help. Get documentation. The earlier the better.  
Also, please look out for each other

# How this class is organized

- Who's Who
- Before you take this class...
- Communication
  - Lectures, OHs, FAQ, etc.
  - Getting Help
- Homework, exams

# About RVR

- Ph.D. C.S., Vrije Universiteit Amsterdam
  - Amoeba Distributed Operating System
- Industry: Research Scientist @ AT&T Bell Labs
  - Unix, Plan 9
- Serial entrepreneur
  - Reliable Network Solutions (IP → Amazon)
  - D.A.G. Labs (acquired by FAST, then by Microsoft)
  - Exotanium (ongoing)

**Interests:** scalable and fault tolerant distributed systems

**Non-geek:** musician (trad. jazz), swing dance, unicycling

# Who are the TAs?

Akalya Asokan  
Adam Alnasser  
Aaron Beiderman  
Andrew Kangrui Cheng  
James Chen  
Benny Rubin  
Becky Hu  
CJ Lee  
Cornelius Osei Owusu Boateng  
June Kim  
James Li  
Kevin Zhen  
Leo Park  
Miguel Angel Roberts  
Michael Elikem Torku  
Minhao Li

Oliver Matte  
Romano Tio  
Robin Li  
**Ruize Ren**  
**Shubham Chaudhary**  
Sam Barton  
Linda Huang  
Steven Long  
Vy Nguyen  
Vinh Nguyen  
Vaishnavi Vinodhkanna  
William Chiang  
Sienna Hu  
Zhanqiu Hu  
**Barry Wang**

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# Prerequisites

- CS 3410, CS 3420 or equivalent required

***Otherwise:*** you must contact an instructor, explain your situation and request permission

# Course Content

## Four Components

1. Lectures
2. Reading
3. Assignments
4. Exams

You are expected to keep up with all four

# Draft Syllabus

- Introduction
- Architectural Support for OSs
- Processes and Threads
- Synchronization
- Scheduling
- Memory Management
- File systems
- Networking (local only)
- Security

# Required Textbook

**OPERATING SYSTEMS  
THREE EASY PIECES**

REMZI H. ARPACI-DUSSEAU  
ANDREA C. ARPACI-DUSSEAU  
UNIVERSITY OF WISCONSIN–MADISON

- Free online
- Buy a PDF or a printed version

# Also: RVR's book

## **Concurrent Programming with Harmony**

Robbert van Renesse  
Cornell University

- Free online
- Free PDF download, or read online

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  - Getting Help
- Homework, exams
- Grades & Policies

# Communications

- Web page
- Lectures
- Ed Discussion
- Office Hours
- CMSX

# Course Web Page

`http://www.cs.cornell.edu/courses/cs4410/`

- Schedule, exam & due dates
- First homework assignment posted on web page
- Homework release and due dates
- Slides posted before each lecture

*Let's have a look around at the [web site](http://www.cs.cornell.edu/courses/cs4410/)*



# CMSX

<https://cmsx.cs.cornell.edu>

- Assignments
- Grades & Regrades

# Lectures

- Tues/Thurs 9:40-10:55pm, live
- Zoom recordings available upon reasonable request

# Office Hours

- Slots posted online
- There are **85** hours each week
  - All days of the week, including evenings
- Before 8pm: in-person
- After 8pm: over Zoom
- You have to register for a slot
  - Please specify NetID and include topic
- *Only sign up for one slot at a time*

# Ed Discussion

- Anonymous to other students, but not anonymous to us
- Ask anything you want, but do not share code unless posted privately to staff
- Provide peer-to-peer help
  - Each student should feel safe, welcome, respected
  - Respect diverse talents and ways of learning

# Email

[cs4410-staff@cornell.edu](mailto:cs4410-staff@cornell.edu): **time sensitive** matters

- Goes to professors & TAs

[cs4410-prof@cornell.edu](mailto:cs4410-prof@cornell.edu): *sensitive* matters

- Goes to RVR only

**Please no emails to personal email accounts**

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- Grades & Policies

# Homework

- Assigned approx. once a week
- Individualized, fillable PDFs
  - (slight) randomization of problem parameters, multiple choice questions, etc.
  - Fully auto-graded (no TAs involved)
  - Regrade requests due within a week
- 2 slip days / assignment
- Max. 6 slip days total
- Your “worst” homework is dropped
  - this does not apply to programming assignments

# Homework 1 due Saturday!

- Posted on CMSX and on the course web site
- Must be submitted on CMSX
  - request an account if you don't have one yet
  - however, having an account on CMSX does not mean you've been admitted



# Programming Assignments

- three different concurrent programming assignments
- work in groups of 2 or 3 students, or do it by yourself if you prefer
  - we can help you find a partner

# Group Code of Conduct

- Each student should feel safe, welcome, respected
- *Participate, but don't dominate*
- Be patient
- Respect diverse talents and ways of learning
- Fight your implicit biases

A well-run team benefits **all** participants

# Academic Integrity & Honor Code

All submitted code must be your own

- Different groups are not allowed to share code
- OK to discuss concepts with any other students

**Violations will be prosecuted**

# Exams

- 2 prelims (March 14, April 25), 1 final (TBD)
  - make-up and exam are back-to-back
    - no other make-up exams
  - best two out of three
  - Exam questions are versions of homework questions
  - Includes questions about lectures, homework, books
- Cumulative
- Regrade requests due within a week

# Academic Integrity

## Why not cheat?

- It hurts you in various ways:
  - It reduces the value of your Cornell degree
  - It stresses you out because you might get caught
  - You won't feel good about yourself afterward
  - The energy that goes into cheating is better used for learning
- It hurts other students:
  - It stresses them out
  - By far most students are honest
- High risk, low reward...

*If you need help, get it early*

# Semester Grades

25%	Homework Assignments
25%	Programming Assignments
50%	Exams (best 2 out of 3)

- No “curving”
  - CS4410 is not a competition
  - Your grade reflects your learning objectives, not how well you did compared to others
  - Goal is to give everyone an A
- Weighing of individual assignments TBD

# Practicum: CS4411

- CS4410 assignments are “small”
- In CS4411, you’re going to have hands-on C development experience with an almost-real operating system: EGOS
  - Write a queue
  - Write a threading package
  - Write a scheduler
  - Write a file system cache
  - Write a file system
- Teams of two to three students

*LOTS OF FUN!*