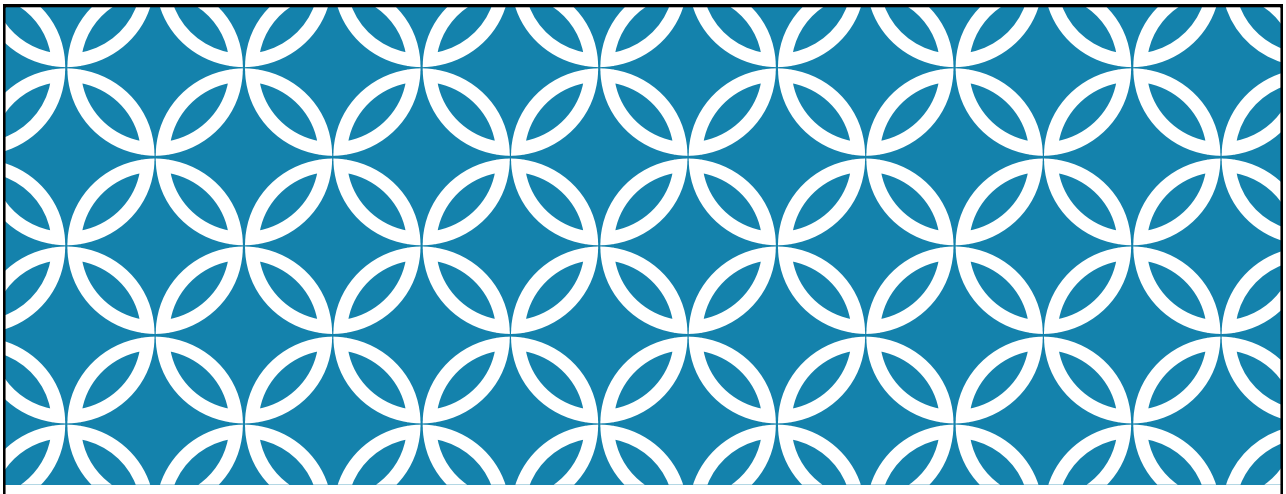


CSCI 4210 OPERATING SYSTEMS

Course Syllabus
David Goldschmidt
(goldschmidt@gmail.com)
Spring 2021

PURPOSE OF THIS COURSE

Prerequisites: CSCI 2300 and either CSCI 2500 or ECSE 2660

Catalog Description: Discussion of various aspects of computer operating systems design and implementation. Topics include I/O programming, concurrent processes and synchronization problems, process management and scheduling of processes, virtual memory management, device management, file systems, deadlock problems, system calls, and interprocess communication. **Programming projects are required.**

We will also study: network programming, queuing theory, multiprogramming, computer security, etc.

Key to success: in this course, you will hone your low-level debugging skills; take the time to carefully review your code and methodically trace its output

LEARNING OBJECTIVES

Demonstrate the ability to compare, contrast, and apply concepts of both classic and modern operating systems

Analyze operating systems by designing and implementing both analytical and simulation models, the latter via a programming language

Implement specific operating system constructs in C on a Linux platform to create real-world systems-level programs and applications

Perform detailed analysis of multiprogramming systems, synchronization, and queuing theory problems

COURSE LMS

All course materials will be available via Submitty: https://submitty.cs.rpi.edu/courses/s21/csci4210

- Log in using your RCS ID (e.g., "goldsd3")

Please specify your time zone when you log in to Submitty!

We will use Submitty's Discussion Forum for course announcements and for asking questions

- Post questions; also answer questions

The course schedule will be posted there (but will likely change)

And check your RPI email at least once per day, especially when we have inclement weather…?

COURSE TAS AND MENTORS

Graduate TAs:
- Qitong Wang
- Sian Chen

Undergraduate mentors:
- Changdi Chen
- Erik Svetlichny
- Sissi Jian
- Vedant Gannu

Our TA and mentor office hours schedule will be posted in Submitty

Do **not** email our TAs or mentors; instead, attend office hours and post questions on the Discussion Forum

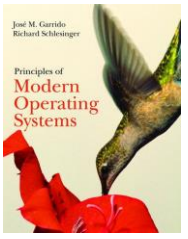
We will use an online platform (TBD) for holding office hours

Check the posted schedule and watch for announcements in case office hours change

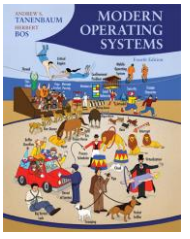
TEXTBOOKS

Recommended textbooks:

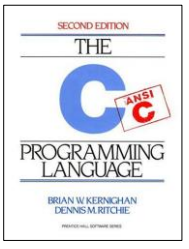
Principles of Modern Operating Systems, 2nd ed.
by Garrido, Schlesinger, and Hoganson
ISBN 9781449626341



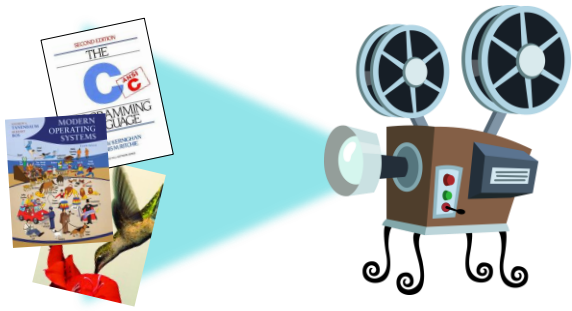
Modern Operating Systems, 4th ed.
by Tanenbaum and Bos
ISBN 9780133591620



The C Programming Language, 2nd ed.
by Kernighan and Ritchie
ISBN 0131103628



CONTENT DELIVERY



Lectures will be pre-recorded and periodically published as links on Submitty (under Course Materials)

Our scheduled lecture block is Mon/Thu 12:20PM-2:10PM ET, but…

…lecture blocks will be optional and held Mon/Thu 12:20PM for ~30 minutes

Each live lecture will be recorded and made available (within ~24 hours)

Our focus during live lecture is on Q&A from the lecture videos and also from the Discussion Forum, walking through programming examples, etc.

Attendance is optional at all lecture blocks

ATTENDANCE AND EXCUSED ABSENCES

Attendance during lecture time is optional

When you do attend lecture (**also office hours**), please turn off cellphones and other non-classroom electronic devices to avoid distractions

IMPORTANT: For all prescheduled and unforeseen absences for which you would like to obtain an extension on a deadline, go to the following URL:

http://studentlife.rpi.edu/student-success/excused-absence

Please do not ask for an extension, extra time, etc. without first obtaining an excused absence via the described policy

REQUIRED SOFTWARE AND OS

We will use a variety of programming languages, all of which have compilers and interpreters available online for free

Expect to learn and program primarily in C, but we will also use C++, Java, Python, etc.

We will use Submitty; therefore, it is highly recommended that you use Ubuntu 18.04.5 LTS to match

- Use VirtualBox or VMWare or some other virtualization platform
- Do not trust the Windows Subsystem for Linux (WSL2)… 🤷
- Do not use Cygwin! 🤮
- **Your code must work on Submitty**
- It is not a valid excuse to state that your code works or worked on "your" platform!

INDIVIDUAL ASSIGNMENTS

There will be four individual homework assignments

- Homeworks will be in C and auto-graded via Submitty
- Due dates are various Wednesdays (by 11:59PM ET)

There will be four lecture exercises (mini-homeworks) due on various Wednesdays (by 11:59PM ET)

There will be two exams (on 3/10 and 4/14) and a comprehensive final exam (TBD)

- We will use our Wednesday 6:55-8:45PM ET test block (and extend it a few hours)
- Make-up exams are only given with an official excused absence
- If you have exam accommodations (e.g., for extra time), please email me your PDF accommodations letter this week by 1/29

SIMULATION PROJECT

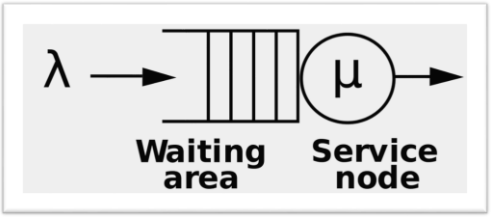
There will be one simulation project to be implemented using C, C++, Python, or Java

Due date is Friday 3/19 (by 11:59PM ET)

You can optionally work in a team of up to three students

- Teams are strongly encouraged but not required
- Teams will be formed via Submitty

The focus of the project will most likely be on the CPU (or short-term) scheduling algorithms that we cover in late February and early March



GRADING CRITERIA AND LATE DAYS

Grading breakdown is as shown here:

(also see next slide…)

Homeworks in C (4)	32%
Simulation Project	10%
Lecture exercises (4)	16%
Exams (2)	24%
Final exam (COMPREHENSIVE)	18%

Submitty late days are available for homeworks, lecture exercises, and the project (but not the exams)

Late days are intended to cover minor illnesses, hardware malfunctions, WiFi issues, conflicts with other assignments, and other minor (or absurd) mishaps

Each of you will initially be given **seven** late days for the semester

Each assignment has a maximum number of late days you can use:

- For homeworks and the project, the max is **three** late days; for lecture exercises, the max is **one** late day

GRADING POLICIES

You may appeal any grade in Submitty by submitting a grade inquiry within seven days of grades being made available

- Explain why you think a grading error was made
- Please do not request a regrade only to argue over how much partial credit was awarded!

Final course grades are based on the following ranges:

- 93-100 A; 90-92 A-; 87-89 B+; 83-86 B; 80-82 B-; 77-79 C+; 73-76 C; 70-72 C-; 67-69 D+; 60-66 D; 0-59 F
- No curving will occur on any specific assignments
- The grade cutoffs will be reviewed after the final exam is completely graded; grade cutoffs may then be decreased

ONLINE MATERIALS

Use the textbooks and posted course materials, plus office hours and the Discussion Forum!

Searching for answers using Google and Stack Overflow is strongly discouraged

Do **not** simply copy-and-paste large chunks of text or code from such sites

Further, do **not** publicly post your code or solutions for any assignments, both during the course and after the course ends

Violations will be treated as academic integrity violations during this course or potentially after this course completes

DISABILITY SERVICES FOR STUDENTS

From http://studenthealth.rpi.edu/disabilityservices:

"The Office of Disability Services for Students (DSS) assists Rensselaer students with disabilities in gaining equal access to academic programs, extracurricular activities, and physical facilities on campus. DSS is the designated office at Rensselaer that obtains and files disability-related documentation, assesses for eligibility of services, and determines reasonable accommodations in consultation with students."

Contact: dss@rpi.edu or 518-276-8197

Please take care of your accommodations by Friday 1/29
(You must renew your accommodations each academic year)

ACADEMIC INTEGRITY

Rensselaer Handbook of Student Rights and Responsibilities:

"Intellectual integrity and credibility are the foundation of all academic work. A violation of the Academic Integrity policy is, by definition, considered a flagrant offense to the educational process. It is taken seriously by students, faculty, and Rensselaer and will be addressed in an effective manner."

"If found responsible for committing academic dishonesty, a student may be subject to one or both types of penalties: an academic (grade) penalty administered by the professor and/or disciplinary action through the Rensselaer judicial process described in this handbook."

https://info.rpi.edu/dean-students/student-rights-responsibilities-and-judicial-affairs

ACADEMIC INTEGRITY POLICY

Individual assignments in this course must be the sole work of each individual student; for the project, team-based work is allowed, but such work must be the sole work of the team members

You must write your own code; use external online resources **extremely sparingly**

If found in violation of the academic dishonesty policy:

- You will receive a grade of zero on the given assignment
- For a second offense, you will receive a non-droppable F in the course
- Each incident will be reported to the Dean of Students or Graduate Dean, as applicable, as well as your Department Head
- Cheating may cause you to be ineligible to mentor for the department, participate in various departmental organizations, etc.

QUESTIONS?