

CSCI 2021: Finale

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Logistics

Goals

- ▶ Final Exam Logistics
- ▶ Evaluations
- ▶ Review

P5: Questions?

- ▶ 1 Required Problem
- ▶ Posted + Video Walkthrough

Date	Event
5/03 Mon	Last Lecture, Review P5 Due Course Evals Due
5/04 Tue	Lab 14 Due
5/08 Sat	Final Exam Opens 1:30pm
5/12 Wed	Final Exam Closes 3:30pm

Official Student Rating of Teaching (SRTs)

- ▶ Official UMN Evals are done online this semester
- ▶ Available here: <https://srt.umn.edu/blue>
- ▶ **EVALUATE ONLY YOUR LECTURE SECTION
Lec 001 or Lec 010**
- ▶ Comment on labs in lecture eval, don't bother with lab section eval
- ▶ **Due** Mon 5/03/2021, last day of class

Course Specific Survey

- ▶ Open on Canvas, Due Tue 5/04
- ▶ Worth 1 Engagement Point to Complete it

Final Exam Logistics

- ▶ Final Exam on Gradescope
 - ▶ ~1.5 pages F/B Virtual Memory / Linking / Object Files / P5
 - ▶ ~1 page F/B Comprehensive Review (F/B = Front/Back)
- ▶ 2 hours to take Final Exam
 - ▶ Final: 2 hours, 2.5 pages
 - ▶ Previous Exams: 1 hour, 1.5 pages
- ▶ Take Exam any time from Opening to Closing

Date	Event
5/08 Sat	1:30pm Final Exam Opens for ALL students 1:30-3:30pm Kauffman on Discord to answer Final Exam Questions (Normal time for Sec 001 1:25pm to take exam)
Sun-Tue	Can take Final Exam any time, no one on duty for Questions
5/12 Wed	1:30-3:30pm Kauffman on Discord to answer Final Exam Questions (Normal time for Sec 020 3:35pm to take exam) 3:30pm Final Exam Closes

What have we done?

C Programming

Lowest of the “high-level” languages, gives fairly direct control over capabilities of the machine at the expense of coding difficulty and ease of mistakes

Assembly Programming

Tied directly to what a processor can do, studied x86-64 specifically, exposes processor internals like registers, instructions, operand sizes, etc.

Computing Architecture

Basics of how CPUs + Memory are built, transistors/gates to do “work” and performance ramifications on code

Processing Systems/Environment

Programs exist in an environment including file formats for executables, specifics of loading, virtual memory system to catch errors/link libraries

Did I miss anything?

Further Coursework

- ▶ **CSCI 4061 Intro to Operating Systems:** Direct successor, required for CS majors, builds on 2021 content to develop the shape of an operating system.
- ▶ **CSCI 4203 Computer Architecture:** Develops hardware/software interface in more detail, study pipelines + superscalar features in more detail, examine multi-core systems
- ▶ **CSCI 5103 Operating Systems:** Study internal design issues associated with operating systems, handling hardware, tradeoffs on different approaches to management, theoretical algorithms around resource coordination.
- ▶ **CSCI 4271W Development of Secure Software Systems:** Focus on security issues, methods to circumvent OS/hardware protections and how ensure safety in programs, incorporating security features into system design.
- ▶ **CSCI 5143 Real-Time and Embedded Systems:** Small systems often lack an OS and fancy hardware, more direct interactions with hardware, must manage resources in your own programs, teaches much about what the machine does as usually less is provided in embedded systems.

Summer Practice

Students often ask what they could do during a summer break to keep up their computing skills. Here are a few ideas.

- ▶ READ: [The Art of Unix Programming by Eric S. Raymond](#)
Fantastic philosophical and pragmatic discussion of how to build systems that work especially in the Unix environment.
(free online)
- ▶ COMPLETE: If you didn't finish a project in this course or another, take some time to do so.
- ▶ EXTEND: If you use VS Code, [Write an Extension for it](#) that does something interesting. This will teach you MUCH about modern software development
- ▶ BUILD: Buy a Raspberry Pi (\$40) and set up; buy an Arduino (\$10) and get a “Blinky” routine to run
- ▶ REST: Take some time away from the screen for fun. Recharging is as important for people as for phones. Play outside. See some people in person. Breathe.

Conclusion

It's been a hell of a semester.
I'm proud of all of you.
Keep up the good work.
Stay safe. Happy Hacking.

