

# CMSC 201: Computer Organization

*23rd of August, 2021*

Lecture: MWF 1:00–1:50pm, Stevens Lab  
Website: <http://cs.longwood.edu/courses/cmssc201/f21/>

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Office hours: MWRF: 9:50–10:50am  
*by appointment or if the door is open*

The organization, design, and structure of computer systems, including both hardware and software principles. Topics include memory addressing, machine-level representations of software and data, fundamentals of logic design, and the mechanics of information transfer and control within a computer system. 3 credits.

## Prerequisites

CMSC 160; CMSC 162 recommended.

## Course Student Learning Outcomes

The student will discover the underlying principles of hardware design and how those principles affect programming practices and performance. At the end of this course, the successful student will be able to:

1. analyze programs at the assembly code level
2. convert data from numbers and text to binary formats
3. build complex computational systems from simple circuits
4. explain how system design affects software design and security

## Textbook and Resources

Computer Systems: A programmer's perspective, Randal E. Bryant and David R. O'Hallaron, Third Edition, Pearson, 2014, ISBN: 978-0134092669

You will be given an account on the department's computer systems. We will use the Linux operating system and the gcc/g++ compiler.

## Course Structure and Student Expectations

You should expect to spend on average about 9 hours of your time every week on this course, including class and reading, practice, homework, and projects.

## Course Requirements

### Tentative Course Schedule

Week	Date	
1	Aug. 23–27	Bits, Bytes, Integers and Floating Point
2	Aug. 30–Sept. 3	Bit-wise operations; Truth Tables; Logic
3	Sep. 8–10	Basic Logic Circuits; Electronics
	Sep. 6	<i>Labor Day</i> no class
4	Sep. 13–17	Multiplexers and Decoders; Full and Half Adders
5	Sep. 20–24	Assembly Language – Registers, Arithmetic, Control Statements
6	Sep. 27–Oct. 1	Structs, Arrays, and Pointers
7	Oct. 4–6	CPU and ALU
	Oct. 7–8	<i>Fall Break</i> no class
8	Oct. 11–15	Fetch–Decode–Execute cycle
9	Oct. 18–22	Pipelining
10	Oct. 25–29	Pipelining
11	Nov. 1–Nov. 5	Memory Circuits
12	Nov. 8–12	aching and Disks
13	Nov. 16–20	Parallelism
13	Nov. 15–19	Parallelism and Amdahl’s Law
14	Nov. 22	Additional topics
	Nov. 24–26	<i>Thanksgiving</i> no class
15	Nov. 29–Dec. 3	Review
	Dec. 7	<b>Final Exam:</b> Tues. 8:00-10:30am

### Important university dates

Aug. 31	Last day of Add/Drop (5pm)
Oct. 1	Last day for Pass/Fail (5pm)
Nov. 3	Deadline to withdraw with “W”
Dec. 3	Last day of classes

### Grading Scale

		A	100–91	A–	90
B+	89	B	88–81	B–	80
C+	79	C	78–71	C–	70
D+	69	D	68–61	D–	60
			59 and lower is an F		

### Graded work

If you are stuck on something talk to me sooner rather than later. The entire course is cumulative so you cannot afford to get behind.

**Participation and Quizzes:** You are expected to be an active participant in the class. You should be present and engaged. Some quizzes will be given in class and cannot be made up. Some quizzes will be take home. You will be attending either in person or online.

**Projects:** There will be five projects related to the topics we have covered so far in the course. Projects will be due within two weeks.

**Exams:** There will be a final exam during finals period. The final exam will, by the nature of the course, be cumulative. Exams are to be your work alone and not discussed with anyone.

## Breakdown

Projects:	50%
Final Exam:	30%
Quizzes and Participation:	20%

## Policies

For a list of campus wide policies please see:

<http://www.longwood.edu/academicaffairs/syllabus-statements/>

## Honor Code

We will follow the Longwood Honor Code in this class. When completing work please do not lie, cheat, or steal.

1. Do not lie and claim someone else's ideas as your own: you must give proper attribution
2. Do not cheat and copy work from another student or the Internet
3. Do not steal someone else's work and submit it: your files are to be written by you
4. YOU are responsible for securing YOUR code/work: do not let someone else have access to your work/files

If you are unsure if your action will violate the honor policy: DON'T DO IT. Feel free to talk with me if you have questions.

Infractions of these policies will be dealt with harshly under the Longwood Honor Code with cases turned in to the Honor Board. Any student convicted of an honor offense involving this class will automatically receive a lowered *final course grade*, potentially severe as an **F**. You should consider all work in this class to be pledged work, whether or not the pledge appears on the assignment.

## Support

Programming (and mathematical proof) is a different way of thinking about problem solving. A solution is not necessarily easy or obvious. I strongly encourage you to follow along with the class in readings and activities. When you have questions, ask. In addition to my regular office hours, you can always email to schedule a time to meet. If my office door is open feel free to stop by, if my door is closed I'm not available.

## Attendance and late work

You are expected to attend and participate in class. Attendance will be recorded in every class. In accordance with campus policy, missing more than 10% of scheduled class time to unexcused absences may, at my discretion, result in the loss of one letter grade. Missing 25% of class or more, whether excused or not, may result in an automatic failing grade.

Late work will not be accepted outside of exceptional circumstances such as serious medical or family emergencies. Most extensions will require a note from a Longwood administrator.

Laptops and other electronic devices are not to be used during class, except with permission. No food in class.

If a student is at risk of missing more than 10% of a course due to Covid-19 quarantine or illness, faculty should work with the student to determine a reasonable path forward based on medical information, grades to date, and time remaining in the semester. Faculty are encouraged to count attendance in ways that are consistent with health and safety. Faculty may require virtual synchronous viewing, watching recorded lectures or participation in online activities, assignments or discussion boards.

**Inclement weather policy**

I don't plan to cancel class for weather unless the entire college shuts down. If extenuating circumstances cause me to cancel class, you will be notified by e-mail.