

CMSC 121: Introduction to Computer Science (Fall 2023)

<http://marmorstein.org/~robert/Fall2023/121.html>

Instructor: Robert Marmorstein, 395-2185, marmorsteinrm@longwood.edu

Lecture (Rotunda G54): 3:00-3:50pm MWF

Office Hours (Stevens 109): 2:00 – 2:45pm (TWR) 1:00 – 2:45pm (F)

I am also available by appointment. To schedule a visit, contact me at least 24 hours in advance.

Course Description: An introduction to computer science for non-specialists. Basic computer architecture and design, storage formats, principles of computer operation, and algorithms. Application software that uses the computer as a tool. 3 credits.

Course Student Learning Outcomes:

By the end of the course, the successful student will be able to

- Convert numbers from decimal to and from several different binary representations
- Create an expression in Boolean algebra for a digital circuit
- Discuss the limitations of algorithms and execute simple algorithms by hand
- Compare and evaluate software and hardware systems on their appropriateness for specific tasks

Civita Core Curriculum Student Learning Outcomes:

At the conclusion of the course, all students will be able to

- create and deliver writing appropriate to audience, purpose, and context
- formulate a question/issue using appropriate mathematical, algorithmic, and/or statistical terms, and explain the decision process behind the choices made in that formulation
- use mathematical, algorithmic, and/or statistical methods to gather and/or analyze data. Justification of the methods chosen should be included
- determine the reasonableness of an answer and/or evaluate the explanations of data for reasonableness. Understand the limitations behind the methods used in the previous outcome
- interpret the results of a mathematical, algorithmic, and/or statistical analysis and present the interpretation in a context appropriate for a broader audience

Course Structure and Student Expectations:

This is a lecture driven class which will meet three times a week for fifty minutes. You should take careful notes of the lecture and class discussions. You will also need to spend time outside of class working on homework assignments, papers, and preparation for tests and quizzes. You should plan to spend a minimum of six hours each week outside of lecture, working on class assignments for this class.

Course Requirements: Your grade will depend on your successful completion of a semester paper (worth 15% of your grade), the midterm exam (20%), final exam (20%), homework and quizzes (40%), and participation (5%).

Major Assignments:

Semester Paper: In order to demonstrate mastery of the skills measured by the Civita Core Curriculum outcomes of this course, you will be expected to complete a project in which you analyze a problem by collecting data, create an algorithmic model, interpret the results, and produce a five page paper explaining the results to an academic audience.

The paper will be assigned in three parts: a proposal, a draft, and a final submission. See the tentative schedule below for due dates for each part.

Note: The draft should consist of a complete paper (roughly five pages) WITH proper citations and preliminary data. I will suggest revisions to the draft which you will incorporate into the final submission.

Midterm Exam: The midterm exam will take place at the end of week seven of the course and will cover all topics discussed in lecture in weeks one through six. A study guide will be provided and collected before the exam, but the exam will be closed book and closed notes.

Final Exam: The final exam will take place on **Friday, Dec. 9th** at 11:30am. I will hand out the exam in Rotunda G54 and it will be due to my office by 2pm. It will be a comprehensive final covering all topics of the course, including those on the midterm exam. A study guide will be provided and collected before the exam, but the exam will be closed book and closed notes.

Homework Assignments and Quizzes: I give unannounced pop quizzes in class. You should prepare for these quizzes by making sure you have read the handouts for each class before coming to lecture. Homework assignments will be submitted as hard copies to my office (Stevens 109). If I am not in, you may slip them under the door. I do NOT accept submissions through Canvas for this course. Electronic copies of the handouts, which you may print if you lose your handout, will be made available on the course web site (<http://marmorstein.org/~robert>).

Note: *Due dates for the major assignments of the class can be found at the end of this syllabus on the tentative course schedule.*

Grading Policy: In general, I do not accept late work and assign it a grade of 0% (even if it is only a few minutes late). However, in some circumstances, such as a medical condition or serious emergency which prevents you from completing the assignment on time, I may be willing to grant an extension. If this arises, you do not need a doctor's note, but you MUST contact me by e-mail within a reasonable period of time (typically 12-16 hours) to explain the reason for the late work so that I can decide whether it merits an exception to the policy.

Grading Scale: A: 91-100, A-: 90, B+: 89, B: 81-88, B-: 80, C+: 79, C: 71-78, C-: 70, D+: 69, D: 64-68, F: 63 and below (note that there is no grade of D- in this course).

Textbook: There will be no textbook for this course. We will, instead, use a series of worksheets that I will hand out in class. If you are unable to attend a lecture, you will need to make arrangements with me to make up the work and notes you have missed.

Attendance: I expect you to attend class unless you are sick or engaged in a school-sponsored extra curricular event (such as a research conference, theater production, programming competition, or athletics tournament). I will primarily rely on your honor to enforce the attendance policy, but do adhere to Longwood's 10% and 25% rules. In accordance with that policy, missing more than 10% of scheduled class time to unexcused absences may result in loss of one letter grade. Missing more than 25% of class (whether excused or unexcused absences) may result in a failing grade.

If you must miss class due to illness or an approved event, you should contact me on Slack or by e-mail **before** the absence (or, if that is not possible, within 12 hours of the absence) to explain why you were absent and to work out a schedule for any missed work (such as pop quizzes).

Sexual Misconduct, Mental Health, Intellectual Property, and Disability Statements: This class follows Longwood policy as described at <http://www.longwood.edu/academicaffairs/syllabus-statements/>

Students that require accommodations are encouraged to contact the professor and the Accessibility Resources Office to work out a plan. See <http://www.longwood.edu/accessibility/>

Longwood is an Honor Code institution, and students in this course are expected to abide by the tenets of the Honor Code. See <http://www.longwood.edu/studentconduct/honor-code/>

Food and Drink: Please do not eat in class (it distracts me and the other students). You MAY bring non-alcoholic beverages to class. Violations of this policy will be considered an unexcused absence and count toward the 10% and 25% rules. I occasionally make exceptions to this rule for students who would otherwise miss lunch or have a related medical condition. If you feel that you need such an exception, you MUST make arrangements with me before you bring food to class.

Cell Phones and Laptops: Cell phones and laptops must be turned off and put away during lecture, unless specifically requested by the instructor. Violations of this policy will be considered an unexcused absence and may also incur a grade penalty.

Collaboration and the Honor Code: All work in this class should be considered to be pledged work. I take the honor code very seriously and will report suspected honor code violations to the honor board – even for a first offense. Any violation of the honor code in this class will result in a grade of **F** for the course in addition to any penalties imposed by the honor board.

However, I do not view the honor code as a punitive tool. It is also a guardian that enables healthy collaboration and research – as long as you know and follow the rules. To that end, here are some principles you should follow in this class:

1. You MAY collaborate on homework problems as long as you:

- a. *write down (or type) your own answers in your own words and*
- b. *give credit to those with whom you have collaborated.*

To give credit, simply write the names of others you have worked with in the margin of your handout.

2. You MAY NOT collaborate in ANY way on tests and quizzes.

Tests and quizzes must be completed entirely on your own. All tests and quizzes will be taken closed-book and closed-notes and you should not discuss them with anyone but me.

3. You MUST give proper credit to sources you use in your work (both on your paper and other course assignments).

Plagiarism is a form of cheating that involves taking credit for someone else's work. Students often don't realize that citing a source by adding it to a bibliography page is not enough – you must also clearly indicate WHERE in your paper or project you used the borrowed material. The easiest way to do this is by adding either a footnote or endnote, but can also use "in-text" citations. The Longwood library has some good materials about how to avoid plagiarism at this link: <https://libguides.longwood.edu/c.php?g=1144855&p=8355762>.

You must cite any sources you use, including articles, interviews, books, web pages, graphics, videos, songs, charts, and other forms of print or electronic media.

4. You MAY NOT use ChatGPT or other AI/LLM tools in course (see discussion below).

5. You MAY ask me for help during office hours.

Information I provide to you during office hours or lecture does not need to be cited unless it comes from an external source (for example, if I point you to an article on the web, you do not need to cite me, but SHOULD cite the web site).

ChatGPT/LLMs: Artificial Intelligence techniques (such as large language models like ChatGPT) pose unique challenges for course delivery. For one thing, use of these tools replaces practice with the skills I want you to develop in the course. For another, AI techniques are known to incorrectly cite (or not cite at all) their many sources. Use of these tools is a sort of plagiarism by proxy. You MAY NOT use these tools in any way on the semester paper, homework assignments, or other work which you turn in for this course – except where explicitly instructed to in the assignment handout.

Writing Center:

The Longwood writing center is available (for free!) to help you with your semester paper. I strongly encourage you to make an appointment with them using this link:

<http://www.longwood.edu/academicsuccess/writing-center/>

Make sure that you properly cite any help you receive from the writing center.

Tutoring:

The Longwood Quantitative Reasoning center provides free tutoring for this course. More information is available on their blog: <https://blogs.longwood.edu/qrcenter/>

Be sure to cite any help you receive from the tutors.

Communications Policy: The best way to get in touch with me is to use **Slack**. Slack is a chat utility with clients for mobile devices and desktop computers. I recommend you install it on both types of devices. Slack will allow you to easily send me code snippets, ask questions in real time, or set up a Zoom meeting (or Google Duo) if we need to video chat. You should sign up for a Slack account by visiting <https://longwood-cmsc.slack.com>. Use your @live.longwood.edu email address to register and you will be automatically approved.

Slack is also a good way to communicate with other members of the class. You will be invited to a public **#cmsc-121** channel in which you can discuss the projects and other course topics with other students in the class. Feel free to ask for help on this channel, but please stick to general questions rather than posting answers. When you send me a Slack message, I instantly get a notification on my computer, tablet, and phone. Typically, I will reply to Slack messages within 24 hours (often sooner) on weekdays. While I am often available in the evening or on weekends, you may need to be patient if I am busy with other students or family obligations.

I will expect you to check the **#cmsc-121** channel every day before class in case I have posted an announcement or asked you to bring something to class.

You can also reach out to me by e-mail to marmorsteinrm@longwood.edu. However, please do not send me large files by e-mail. They take up space toward my limited quota on the mail server and cause me all sorts of headaches. **E-mail messages containing large files will be deleted unread.** I am much slower at replying to e-mail (since I do not get a notification and have to log in to check it). Typically, you can expect a reply to an e-mail within 48 hours, but this may be longer on weekends and I may not receive your message at all or may not be able to respond to it (my inbox is often over the “quota” allowed by campus I. T. and this often prevents me from using the system effectively).

If you are **asking for help with a project or homework problem**, you should attach your work to a direct message in Slack so that I can see where you are at. You should do this by using the “plus” icon to attach the file directly to your message or by copy/pasting the particular snippet of code you are working on to the body of the message.

Please do NOT attach pictures of your computer screen taken on your phone. These are blurry and hard to read and I can’t run them to see why they are failing. If you need me to see your screen, you can copy/paste code directly into Slack. In Linux, you can take screenshots of your system using the “spectacle” program (usually by pressing the Print Screen “PrtSc” key).

One last suggestion: don’t “ask to ask”. I am delighted to answer questions about the projects and homework assignments and you should feel free to ask questions at any time (yes, even 3am the night before the assignment is due – I MIGHT be awake and online). Asking me whether you can ask a question wastes my time and yours.

Tentative Course Schedule:

Week 1: Aug 21 – 25	Introduction: Quantitative Reasoning, Computer Hardware: The Parts of a Computer
Week 2: Aug 28 – Sept. 1	The Order of Operations
September 4	Labor Day Holiday: NO CLASS
Week 3: Sept. 6 – 8	Algorithmic Design (Recursion)
Week 4: Sept. 11 – 15	Algorithmic Design (Functions and Decisions)
Week 5: Sept. 18 – 22	Text and Images, Machine Learning Semester Paper: <u>Paper Proposal Due</u>
Week 6: Sept. 25 – 29	Binary and Hexadecimal Numbers <u>Midterm Review Packet Due</u>
Week 7: Oct. 2 – 4	Midterm Review and Midterm Exam
Oct. 5 – 6	Fall Break: NO CLASS
Week 8: Oct. 9 – 13	Two's Complement Numbers
Week 9: Oct. 16 – 18	Floating Point Numbers
October 20	CCSC Eastern Conference: NO CLASS
Week 10: Oct. 23 – 27	Circuits, Truth Tables, and Digital Logic Semester Paper: <u>First Draft Due</u>
Week 11: Oct. 30 – Nov. 3	Laws of Logic and Boolean Algebra
Week 12: Nov. 6 – 10	Error Correcting Codes
Week 13: Nov. 13 – 17	File Compression
Nov. 15	Research Day: NO CLASS
Week 14: Nov. 20	Paper Work Day Semester Paper: <u>Final Draft Due</u>
Nov. 22 – 24	Thanksgiving Break: NO CLASS
Week 15: Nov. 27 – Dec. 1	Catchup and Review
December 9 (Friday)	FINAL EXAM (8:00am – 10:30am)

Note: Our exam slot overlaps with the MWF 2pm exam slot. If you have a conflict, please contact me in advance to arrange a different exam time.