

CS 2110 [A, B, C, D, GR, O] – Computer Organization and Programming Syllabus – Fall 2026

Instructors: Dr. Tom Conte [C], Dr. Joonho Kim [B & D], Dr. Mark Moss [A/GR, O]

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[A, B, C, D & GR] Lectures are synchronous and in-person only / [O] Lectures will be online, some labs in-person

Instructor	Sections	Lecture Times & Locations	Office Hours & Location(s)
Dr. Tom Conte	C	C: Tue/Thu, 2:30pm – 3:15pm, 1456 KACB	Tue, 3:30pm – 4:30pm, 2334 KACB Thu, 1:00pm – 2:00pm, 2334 KACB
Dr. Joonho Kim	B & D	B: Tue/Thu, 3:30pm – 4:45pm, 152 CULC D: Tue/Thu, 5:00pm – 6:15pm, 152 CULC	Mon/Wed, 11:30am – 1:00pm, 138 CCB
Dr. Mark Moss	A/GR, O	A/GR: Tue/Thu, 11:00am – 12:15pm, 111 IC O: Pre-Recorded Videos in Canvas Media Gallery	Tue/Thu, 12:30pm – 1:30pm, 217 CCB Mon, 10:00am – 12:00pm, Online

Purpose of Course: This course introduces you to **the fundamentals of how computers work** from both the hardware and software points of view. It serves as a “roadmap” for the rest of the computer systems courses that you will take here. After taking this course, you will have a better understanding of how a program is translated into commands for execution on hardware, and how the hardware executes those commands using, ultimately, electrons to do the work.

This information applies to all On-Campus/In-Person Sections, and much of it applies to the Online Section as well. Please see the last page(s) of this document for any other distinctions and/or exceptions for the Online Section.

Prerequisite: CS 1331

Books: (1) **Patt & Patel:** Introduction to Computing Systems: From Bits & Gates to C++ & Beyond 3rd Ed (2019)

(2) The C Programming Language, Kernighan & Ritchie [optional, recommended]

(3) Our class notes (made available after lectures)

Reading Topics: (The “Living Schedule” on Canvas)

Topic	P&P Section(s)		
Course Intro, Bits, & Data Types	1.1-1.7, 2.1-2.4	Stack, Queue, Character Strings	8.1, 8.4-8.5
Operations on Bits & Other Representations	2.5-2.7	Subroutines, Traps	8.1, 9.3
Digital Logic Structures	3.1-3.2	Assembly I/O	9.1-9.5
Combinational Logic Circuits	3.3	Intro to C, Variables, Scopes	11.1-11.6, 12.1-12.2
Logic Synthesis	(Notes)	Operators, Conditional Constructs, Iteration Constructs	12.3-12.7, 13.1-13.6
Basic Storage Elements	3.4-3.5	Pointers	16.1-16.2
Sequential Logic Circuits	3.6-3.7	Arrays, Strings	16.3-16.4
Von Neumann Model, LC-3, & Instruction Processing	4.1-4.4	Functions, Calling convention	14.1-14.5
The ISA & Operate Instructions	5-1-5.2	Recursion, Calling convention	17.1-17.8
Data Movement Instructions & Control Instructions	5.3-5.5	Testing and Debugging	15.1-15.6
Data Path, Problem Solving, & Debugging	5.6, 6.1-6.2	Structures in C	19.1-19.3
Assembly Language Programming, Assembly Process, & Assembly of Multiple Programs	7.1-7.4	Dynamic Memory Allocation	19.4-19.6
		I/O in C	18.1-18.6
		Introduction to C++	20.1-20.5

Course Workload:

The course has projects, quizzes, homework assignments, and a final exam:

- 25% Projects (5 projects, 5% each)
- 40% Quizzes (4 quizzes, 10% each)*
- 8% Homework (8 assignments, 1% each)**
- 3% Lecture Attendance & Participation†
- 2% Lab Attendance & Participation††
- 22% Final Exam

***Quizzes will be held during some of the Supervised Lab sessions, and in-person attendance is required.**

****Homework #0:** You are required to *visit your instructor's* office at least once *during their office hours & before November 25th (Student Recess & Thanksgiving Break)*. You must announce that your visit is “for Homework #0” and bring official GT ID. Be prepared to stay for at least three minutes to answer a question or two. This counts as a real homework! *If for some reason you cannot meet this requirement, please contact your lecturer via email three weeks before the due date.*

†You must attend lectures to earn the associated credit: You are permitted 3 lecture absences without need for excuse (see also Rule 6 below). We might employ an automated system to monitor attendance; and, if so, then you will be expected to configure your system (e.g., load the appropriate application on your device) to receive credit.

††You must attend labs to earn the associated credit: You are permitted 3 unexcused absences (see also Rule 6 below). Further absences will reduce your attendance score proportionally. Lab absences do NOT apply to mandatory quiz dates: missing a quiz will still result in a zero unless prior arrangements have been made with the Instructional Staff and Division of Student Life Office (per Rules 6 & 10).

Course Rules:

1. **Reasonable accommodations will be made for students with verifiable disabilities.** In order to take advantage of available accommodations, students must register with [Disability Services](#).
2. **Final grades will use the scale:** [100:90] = A, (90:80] = B, (80:70] = C, (70:60] = D, (60:0] = F.
3. A linear “shift of means” curve might be applied to your final score. (Historically, this has been *at most* +2 points.)
4. **There is no extra credit provided in this course.**
5. Some assignments will be due during the final instructional days of the semester.
6. If you have any major personal problems (family/illness/etc.), please go to the Division of Student Life Office.
7. **All assignments must be turned in on time.** Late assignments are capped using the **late assignment window** as follows:
 - On time: 100% (maximum score)
 - After deadline, before 24 hours after deadline: 70% (maximum score)
 - After 24 hours, before 48 hours after deadline: 50% (maximum score)
 - After 48 hours: 0%
8. **You are also responsible for ensuring that what you turned in is what you meant to turn in.** If you have any problems submitting via Canvas, email the Head TA what you would have submitted BEFORE the end of the late assignment window. No submissions will be accepted after the submission window (later than 48 hours) has closed – **no exceptions**.
9. **Lab attendance is as important as lecture attendance.** The TAs will discuss important information during labs pertaining to projects and assignments and will also conduct illuminating exercises that complement the concepts presented in the lectures. The lab sessions also have a smaller number of students, which tends to facilitate more open and active discussion and interaction.
10. **Quizzes and the Final Exam must be taken at the scheduled date and time.**
 - a. Missing a quiz: Failure to attend a quiz will result in a zero (0) score. One exception: if – and only if – your excuse for missing the quiz is approved by the instructor, then the missing quiz score will be replaced with your Final Exam score.
 - b. Missing the Final Exam: Failure to attend the Final Exam will result in a zero (0) score. You must contact the Head TA or your instructor *in advance* if you have an Institute-approved excuse to reschedule the Final Exam.
11. **The deadline for re-grades is 2 weeks after an assignment grade is posted** or returned to the class. Regrades are only for correct answers accidentally marked as partially or completely wrong. **There are no regrades for higher partial credit (i.e., no “point fishing”).**

12. You will be automatically signed up for a Piazza forum for this course. The link will be made available via Canvas. The course Piazza forum is only for posting technical questions about assignments, tests, etc. Do not give away answers to questions on Piazza!
13. The Canvas and Piazza announcements must be read every day.
14. **Sections A/GR, B, D, & O (Kim & Moss) only:** Notetaking via laptop computer, tablet and paper will be permitted initially. Any computing activities must be focused solely on taking notes and fulfilling course activities. If these conditions are violated, and especially if these violations cause significant disruptions to other students in the class, then these privileges may be suspended.
15. **Section C (Conte) only:** Use of a paper notebook is recommended. Electronic tablets (e.g., iPad, Remarkable, Kindle Scribe, etc.), are permitted but it must remain in Airplane mode during lecture (i.e., no internet access). **Neither Laptop Computer Nor Phone Usage Is Permitted During Lecture** (unless you have written permission from Dr. Conte).
16. Recordings of lecture, lecture materials and other artifacts are copyrighted by your instructors. **No non-educational reproduction of any materials, including lecture records and recordings, is permitted.**

Academic Misconduct:

Preamble: *The goal of all assignments in CS 2110 is for you to learn. Learning requires thought and hard work. Copying answers thus prevents learning. More importantly, it gives an unfair advantage over students who do the work and follow the rules.*

As a Georgia Tech student, you have read and agreed to the [Georgia Tech Academic Honor Code](#). The Academic Honor Code defines Academic Misconduct as “*any act that does or could improperly distort Student grades or other Student academic records.*”

You must submit an assignment or project as your own work. **No collaboration on answers is permitted. Absolutely no code or answers may be copied from others. Such copying is Academic Misconduct.**

Using code from GitHub, via Googling, from Stack Overflow, etc., is Academic Misconduct (Honor Code: Academic Misconduct includes “*submission of material that is wholly or substantially identical to that created or published by another person or persons*”).

Publishing your assignments on public repositories, GitHub, etc., that is accessible to other students is unauthorized collaboration and thus Academic Misconduct.

Suspected Academic Misconduct will be reported to the Division of Student Life Office of Student Integrity. It will be prosecuted to the full extent of Institute policies.

We use accepted forensic techniques to determine whether there is copying of a coding assignment.

Submitting an assignment with code or text from an AI assistant (e.g., ChatGPT) is academic misconduct.

If you are not sure about any aspect of this policy, please ask your lecturer.

Using AI Assistants:

Anything you did not write in your assignment will be treated as an academic misconduct case. If you are unsure where the line is between collaborating with AI and copying AI, we recommend the following heuristics:

Heuristic 1: Never hit “Copy” within your conversation with an AI assistant. You can copy your own work into your own conversation, but do not copy anything from the conversation back into your assignment.

Instead, use your interaction with the AI assistant as a learning experience, then let your assignment reflect your improved understanding.

Heuristic 2: Do not have your assignment and the AI agent open at the same time. Like the previous heuristic, use your conversation with the AI as a learning experience, then close the interaction down, open your assignment, and let your assignment reflect your revised knowledge.

Heuristic 3: Do not integrate or activate AI-based tools directly into your composition environment. Just as you should not let a classmate write content or code directly into your submission, so also you should avoid using tools that directly add content to your submission.

Deviating from these heuristics does not automatically qualify as academic misconduct; however, following these heuristics essentially guarantees your collaboration will not cross the line into misconduct.

Coding Guidelines (C/C++ code):

1. You must turn in ALL files specified in the “Deliverables” section of the assignment instructions. We reserve the right to impose a penalty on submissions that do not follow the given submission directions.
2. You must provide a **Makefile** that compiles and links your code by default. **If you are given a Makefile with the project, we expect your code to compile with make. (don’t worry, we’ll explain what all this means later)**
3. Your code must compile with **gcc** on Ubuntu 22.04 LTS. If your code does not compile, then you will receive a zero/0.
4. You will be penalized if your code produces warnings when compiled with the given Makefile, or the following flags if no Makefile is provided: **gcc -Wall -Wextra -Wstrict-prototypes -pedantic -O2**
5. Code should be well commented and use a clean, consistent (readable) style (i.e., proper indenting, etc.). We may impose style requirements and deduct for non-conforming solutions. This is **not** the [obfuscated C code competition](#)!

Online Section Distinctions and Exceptions:

The online sections will cover the same material as the on-campus/in-person sections, and online students will complete the same homework assignments, exams/quizzes, and projects. The main distinction is that they will receive the lectures as pre-recorded videos, and many of the labs will be conducted online via Zoom (or an alternative like Microsoft Teams).

- **Lecture Sessions:** There are no designated lecture times or locations for the online sections. The material normally presented to the on-campus lecture sessions will be provided via pre-recorded videos for the online sessions. These videos will NOT necessarily be 75-minute continuous recordings of an on-campus lecture, but rather a pre-recorded set of smaller videos broken down into smaller 5- to 20-minute segments based on the content for a particular lesson. The pre-recorded videos for a given lesson will be available no later than the morning of the on-campus lecture for that corresponding lesson. We will work to make the pre-recorded videos available as early as reasonably possible.
- **Lab Sessions:** There are designated lab times and locations for the online sections. Lab sessions for the online sections will be conducted by some of the TAs and recorded for those unable to attend the sessions live/synchronously. The session will cover the same topics as the on-campus lab sessions. Dates and times for these sessions will be announced in advance, and attendance is highly suggested as an opportunity to ask questions and receive clarification about the course material and key concepts. The online lab sessions will most likely be conducted via Zoom or Microsoft Teams.
- **Lab Attendance/Participation:** There is no requirement for online students to attend the online lab sessions live, so we will reframe the "attendance" score for them as more of a "participation" score. More specifically, there will be a small Canvas “Lab Participation” Quiz for each online lab session. Each quiz will normally be available for completion within 1-2 days of the corresponding lab session. To earn full participation points, online students must complete the quizzes. Like the attendance scores for on-campus students, online students will be permitted a limited number (e.g., three/3) of missed/unexcused lab participation quizzes, and then any other missed participation quizzes will count (proportionally) against the student's lab participation score. These participation quizzes are primarily being used to verify participation, and not as much to master the concepts, so these quizzes won't necessarily be reviewed immediately; in fact, they will most likely only be evaluated at the end of the semester.
- **Quizzes and Exams:** *Online students must take the quizzes and exams - including the Final Exam - in person.* The dates and times for these events are shown on the Living Schedule. Online students must take the quizzes at the assigned locations, and take the Final Exam where they attend lecture. The general locations for these events will be somewhere on the GT Atlanta Main Campus, and more precise locations will be determined and published as soon as possible.
- **Project Demonstration/Demo:** Each project will have a corresponding assessment referred to as the "project demonstration" or “project demo” for short. After completing each project, all students will take a quiz-like assessment focused on concepts from that project. The project demo assessments will be taken remotely with proctoring (e.g., Lockdown Browser, Honorlock), but they must be taken during the designated lab date/time windows. Dates and times for these project demonstrations/demos will be published in the Living Schedule.

Statement for not mentioned policies and issues: Any policies and issues not mentioned in this syllabus will follow policies and procedures according to the Georgia Institute of Technology: <http://policylibrary.gatech.edu>