

CS 2110 – Computer Organization and Programming
Syllabus – Fall 2020

Prof. Tom Conte conte@gatech.edu

Lecture: 12:30-1:45pm[†] Tuesdays and Thursdays
([†]All times are in the Atlanta, USA (Eastern) time zone)

Lectures are synchronous

Lectures are remote and via a Bluejeans link posted in Canvas and Piazza.

Conte Office Hours [*via Canvas*]: **1:00-2:00pm Wednesdays, 2:00-3:00pm Thursdays** or by appointment

Head TA: Manley Roberts, manleyroberts@gatech.edu (TA Office Hours will be posted on Canvas)

Purpose of course: This course introduces you to **the fundamentals 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.

Prerequisite: CS 1331

Books: **(1) P&P:** Introduction to Computing Systems: From Bits & Gates to C & Beyond **3rd Ed**, Patt, & Patel **(2019)**
 (2) The C Programming Language, Kernighan & Ritchie [optional, recommended]
 (3) My class notes (made available after lectures)

Topics (reading): “Living schedule” is posted on Canvas

Topic	P&P Section(s)
Course Intro, Bits, & Data Types	1.1-1.7, 2.1-2.4
Operations on Bits & Other Representations	2.5-2.7
Digital Logic Structures	3.1-3.2
Combinational Logic Circuits	3.3
Logic Synthesis	(Notes)
Basic Storage Elements	3.4-3.5
Sequential Logic Circuits	3.6-3.7
Von Neumann Model, LC-3, & Instruction Processing	4.1-4.4
The ISA & Operate Instructions	5-1-5.2
Data Movement Instructions & Control Instructions	5.3-5.5
Data Path, Problem Solving, & Debugging	5.6, 6.1-6.2
Assembly Language Programming, Assembly Process, & Assembly of Multiple Programs	7.1-7.4

Stack, Queue, Character Strings	8.1, 8.4-8.5
Subroutines, Traps	8.1, 9.3
Calling Convention, Recursion	8.2-8.3
Assembly I/O	9.1-9.5
Intro to C, Variables, Scopes	11.1-11.6, 12.1-12.2
Operators, Conditional Constructs, Iteration Constructs	12.3-12.7, 13.1-13.6
Functions	14.1-14.5
Pointers	16.1-16.2
Arrays, Strings	16.3-16.4
Recursion	17.1-17.8
Testing and Debugging	15.1-15.6
Structures in C	19.1-19.3
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 three programming/simulation projects.

55%	Projects (5 total, 11% each)
15%	Quizzes I, II, III, IV and V (5 total, 3% each*) <i>Quiz Schedule:</i> in class: Sep 3, Sep 17, Oct 8, Oct 29, Nov 19**
15%	Final exam (prescheduled , Tuesday, Dec 8 @11:20 AM - 2:10 PM)
15%	Homework (One new homework every 1 to 2 weeks)

**Quizzes are 30 minutes at the beginning of lecture. There is a lecture after the end of each quiz.*

***There is a “Living schedule” posted on Canvas*

Course Rules (the legal stuff...)

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 will 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. See also section below “COVID-19 Expectations and Guidelines.”
7. **All assignments must be turned in on time.** Late assignments are weighted using the **late assignment window** as follows:
 - On time: 100%
 - After deadline, before 24 hours after deadline: 70%
 - After 24 hours, before 48 hours after deadline: 50%
 - 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. After the late assignment window (later than 48 hours) is a 0, no exceptions.
9. **Lab attendance is encouraged.** There are no timed labs in this section of CS 2110. The TAs may discuss important information pertaining to projects and assignments. If you will need to miss a recitation, contact your TA or another student in the section to see what you’ve missed.
10. **Demos are required for all projects.** Sign up for demo timeslots with TAs via Canvas **before the beginning of the first demo slot.** If you cannot attend one of the predetermined demo time slots, e-mail the Head TA. You must contact the Head TA at least 72 hours before the last posted demo slot for the project begins. Do not wait until the last minute to sign up! ***If you sign up for a demo and miss it without a valid excuse you will get 50% of the points off.*** Only excuses approved by the Division of Student Life are valid. If you know you are going to miss a demo at least 24 hours ahead of time, you may cancel your slot on Canvas with no penalty. Cancellations closer to the demo time may be treated as a missed demo.
11. **Quizzes/Final Exam must be taken at the scheduled date and time.** Failure to attend an exam results in a 0.
12. **Quizzes/Final Exam will be proctored** via HonorLock (see below). Each Quiz is low stakes (3%): I want you to learn the material and take the quiz on your own. Students are assumed to have read and agreed to the Georgia Tech Honor Code, see <http://osi.gatech.edu/content/honor-code>
13. **The deadline for re-grades is 1 week after an assignment grade is posted** or returned to the class. Regrades are only for correct answers accidentally marked as wrong. **There are no regrades for higher partial credit (i.e., no “point fishing”).**
14. 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!

15. The Canvas and Piazza announcements should be read every day.
16. **Try to avoid distractions during lecture. I realize this will be challenging because it's a remote lecture. You will be tempted to surf Insta-FaceTivity-Toc, etc.. Try not to, please.** There is much research that handwritten note taking is a fundamental and important way to integrate information. Use a paper notebook. If you don't understand something, ask a question.
17. Recordings of lecture will be made available within 24 hours of lecture time.
18. Recordings of lecture, lecture materials and other artifacts are copyrighted by Prof. Conte. **No non-educational reproduction of any materials, including lecture records, is permitted.**

Coding guidelines (C/C++ code)

19. 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.
20. 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 under the given Makefile.**
21. Your code must compile with **gcc** on Ubuntu 18.04 LTS. If your code does not compile, you will receive a 0 for the assignment.
22. 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 -pedantic -O2**
23. Code should be well commented and use a clean, consistent (readable) style (i.e., proper indenting, etc.). We reserve the right to impose style requirements, and deduct for non-conforming solutions. This is **not** the [obfuscated C code competition!](#)

Plagiarism (cheating)

24. As a Georgia Tech student, are assumed to have read and agreed to the Georgia Tech Honor Code, see <http://osi.gatech.edu/content/honor-code>
25. A student must submit an assignment or project as his/her own work (this is what is expected of the students).
26. **Important:** we understand that students talk to each other about assignments. You must list the people you collaborated with at the very top of the assignment hand-in. However, **no code or answers should be copied from others, even your collaborators. Such copying is plagiarism and will be referred to the Office of Student Integrity. Simply put, the sharing of the answer is plagiarism.** If you are not sure about it, please ask a TA or stop by the instructor's office during the office hours.
27. Suspected plagiarism will be reported to the Division of Student Life Office of Student Integrity. It will be prosecuted to the full extent of Institute policies.
28. Using code from GitHub, via Googling, from Stack Overflow, etc., **is** plagiarism and is not permitted. Do not publish your assignments on public repositories (i.e., accessible to other students). This is also a punishable offense treated as plagiarism.
29. TAs and Instructor determine whether the project is plagiarized. **Trust us, it is really easy to determine this....**

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>

HonorLock

This course will use digital proctoring for all quizzes and exams. The following are required of students. Honorlock technical requirements:

Minimum System Requirements

Last updated July 1, 2020

Honorlock can be installed on devices meeting the following requirements:

Operating System:

- Windows 10
- MacOSX 10.13 and higher
- ChromeOS 79 and higher

Browser

- Google Chrome version 79 and higher

Internet Speed

- 1.5 Mbps download, 750 Kbps upload

To check if your device meets minimum system requirements, please visit <https://honorlock.com/support/> and scroll to the 'Simple Single-Click Test'.

Currently, Honorlock does not work with iPads.

- Students must have a **broadband internet connection** (check at <https://honorlock.com/support> under “Simple Single-Click Test”)
- Students must have a **webcam and microphone**
- Students must have a **secure private location to take an exam**
- Students will be asked to **provide a picture ID and take a picture of themselves via a webcam** as part of the exam process
- Honorlock ***is not*** compatible with Linux OS, Virtual Machines, tablets, or smartphones
- Honorlock **requires** the installation of [Google Chrome](#) and the [Honorlock Chrome extension](#)

Fall 2020: COVID-19 Expectations and Guidelines

Each of us has a responsibility to ourselves and our fellow Yellow Jackets to be mindful of our shared commitment.

Instructor Illness or Exposure to Covid-19

During the fall 2020 semester, some faculty members may be required to quarantine due to exposure or isolate due to a Covid-19 diagnosis. Some disruption to classes or services is inevitable, but Georgia Tech is making every effort to ensure continuity of operations. As is the case in any semester, faculty may cancel a class if they have an illness or emergency situation and cover any missed material at their own discretion. If an instructor needs to cancel a class, they should notify students as early as possible.

Student Illness or Exposure to Covid-19

During the semester, you may be required to quarantine or self-isolate to avoid the risk of infection to others. Quarantine is the separation of those who have been exposed to someone with Covid-19 but who are not ill; isolation is the separation of those who have tested positive for Covid-19 or been diagnosed with Covid-19 by symptoms.

If you have not tested positive but are ill or have been exposed to someone who is ill, please follow the [Covid-19 Exposure Decision Tree](#) for reporting your illness.

During the quarantine or isolation period you may feel completely well, ill but able to work as usual, or too ill to work until you recover.

Unless you are too ill to work, you should be able to complete your remote work while in quarantine or isolation.

If you are ill and unable to do course work this will be treated similarly to any student illness. The Dean of Students will have been contacted when you report your positive test or are told that it is necessary to quarantine and will notify your instructor that you may be unable to attend class events or finish your work as the result of a health issue. Your instructor will not be told the reason.

CARE Center, Counseling Center, Stamps Health Services, and the Student Center

These uncertain times can be difficult, and many students may need help in dealing with stress and mental health. The [CARE Center](#) and the [Counseling Center](#), and [Stamps Health Services](#) will offer both in-person and virtual appointments. Face-to-face appointments will require wearing a face covering and social distancing, with exceptions for medical examinations. Student Center services and operations are available on the [Student Center](#) website. For more information on these and other student services, contact the Vice President and Dean of Students or the [Division of Student Life](#).

Accommodations for Students at Higher Risk for Severe Illness with Covid-19

Students may request an accommodation through the Office of Disability Services (ODS) due to 1) presence of a condition as defined by the Americans with Disabilities Act (ADA), or 2) identification as an individual of higher risk

for Covid-19, as defined by the Centers for Disease Control (CDC). Registering with ODS is a 3-step process that includes completing an application, uploading documentation related to the accommodation request, and scheduling an appointment for an “intake meeting” (either in person or via phone or video conference) with a disability coordinator.

If you have been approved by ODS for an accommodation, I will work closely with you to understand your needs and make a good faith effort to investigate whether or not requested accommodations are possible for this course. If the accommodation request results in a fundamental alteration of the stated learning outcome of this course, ODS, academic advisors, and the school offering the course will work with you to find a suitable alternative that as far as possible preserves your progress toward graduation.

Election Day

The Faculty Executive Board endorsed the following request made by the student government: In order to increase the opportunities for students to vote on the national election day, Tuesday, November 3, course instructors are strongly encouraged to not schedule in-class assessment activities and to make available lecture recordings for students who are unable to attend regularly-scheduled classes that day. **I will follow this request.**