

CS 2261 Media Device Architecture

Instructor: Aaron Hansen (aaron.hansen@gatech.edu)

TAs:

- Chianne Connelly - Head TA (cconnelly@gatech.edu)
- Joshua Redding (jredding8@gatech.edu)
- Armando Gonzalez
- David Friedman (emails forthcoming)

Lecture:

Mondays/Wednesdays: 3:00 - 4:15 pm (Klaus 2456)

Recitation/Lab:

Recitation: Tuesdays/Thursdays: 4:30 - 5:45 pm (Klaus 2456)

On weeks with a timed lab, that will typically occur during the Thursday timeslot.

Instructor Office Hours:

Mondays/Wednesdays: 4:20 - 5:20 pm (CCB 49C) -- just after class!

TA Office Hours:

Schedule forthcoming on Class Website (CCB 104B)

Class Website: Canvas - <https://gatech.instructure.com/courses/21960>

Recommended Textbooks/Resources:

- The C Programming Language - Kernighan and Ritchie (a.k.a., “K&R”)
- TONC - <https://www.coranac.com/tonc/text/>
- Programming the Nintendo Gameboy Advance: The Unofficial Guide by Jonathan Harbour (look around on the internet)

Purpose and Goals:

This course is intended to greatly demystify what a computer is and how exactly it works. By the end of this course, the zeros and ones of computing should finally make sense. This course is intended to have students understand how hardware and software architecture affects what is easy vs hard to program on a given machine. It should provide an understanding of programming at the level of shuffling bytes, as well as at the “higher level” (yes, C is considered a high-level language) and in between.

To those ends, by the end of the course students should:

- Understand data representation. Be able to convert numbers between various representations: Binary, octal, decimal and hexadecimal.
- Be able to identify the component parts of the Von Neumann Model of computer and be able to explain the purpose of each component.
- Be able to use utilities for conversion of image and sound files into C data structures
- Be able to write C programs that are hundreds to thousands of lines long that manipulate device hardware and perform some logical function such as creating a playable video game.
- Be able to design, write and debug code to perform operations such as:

- Displaying images
- Creating simple animations used in simple bit-mapped games
- Use double buffering for smooth animation
- Using DMA to speed up animations
- Effectively use indexed color, tiles and sprites.
- Starting, stopping and looping sounds
- Reading buttons
- Maintaining and changing state
- Servicing interrupts

Note: The course is also not designed to train students to be “C developers,” although some may take away information useful in that endeavor.

Grading Policy and Breakdown:

Grades will be handled through Canvas and we should have lab TA hours posted soon there as well. Grades will only be distributed on Canvas and in the final grade reports at the end of the semester. Per federal law, grades will not be reported or details disclosed via email. Canvas is normally used to report individual grades during the term, but final grades are typically computed externally. So at the very end of the term, any curves or last minute changes will likely not be updated and posted again on Canvas.

Homework	25%
Labs	10%
Quizzes (announced at least 1 week in advance)	25%
Milestones	20%
Final Project	20%

You must contest any grading issues within two weeks of the grade being provided. Please discuss grading issues first with your TA. If there is still a dispute, only then should you approach the course instructor.

Attendance:

Students are responsible for all material covered in class, including changes in schedules announced during class. Make-up assignments are generally not permitted, except due to an officially excused absence. **Students missing an assignment without an excused absence will receive a grade of zero on that assignment.** Excused absences or requests for grades of incomplete must be approved through the CoC academic office and/or the Dean of Students office. Any approved make-up assignments are not guaranteed to be the same as the original given in class or subject to the same (if any) curve.

You will be required to show your Buzzcard when turning in quizzes in class. If you cannot produce a Buzzcard the day of the quiz, your picture will be taken and associated with your name. You will then have 10 days to attend office hours and produce your Buzzcard to prove your identity; otherwise, you will receive a **zero** for the midterm.

If there is a problem submitting an assignment, email the course instructor and the Head TA as soon as possible.

Back up your source code early and often. An external git repository with a local working copy (via a private repo on Bitbucket, GitHub, etc.) is a good option. Even then, you might want to make sure your project folder is automatically backed up to some offsite location. If you experience catastrophic hardware failure we will work with you while your equipment is being repaired. However no extensions will be granted due to your lack of backups.

Academic Honesty:

Although students are encouraged to work together to learn the course material, all students are expected to complete quizzes, homeworks and projects individually, following all instructions stated in conjunction with the given assignment. You MAY NOT copy code from others in any way. You MAY NOT use solutions that others have developed as the basis for your solutions. However, you ARE allowed to discuss the problems with others, including fellow students, teaching assistants, and the instructor. Periodically, automatic plagiarism detection algorithms may be used to compare source code against all students in the course. You ARE allowed to solicit and obtain help in design and debugging your solutions. You CAN show others your code and ask for advice about why it is not working or how to make it work better. But to be totally clear, you MUST implement your own solution. If someone helps you, you still MUST enter every line of code of your solution personally, and you MUST fully understand every part of your submission. Students should be prepared to explain each lab assignment and their work when demoing work to the TA. All conduct in this course will be governed by the Georgia Tech honor code. Additionally, it is expected that students will respect their peers and the instructor such that no one takes unfair advantage of any other person associated with the course. Any suspected cases of academic dishonesty will be reported to the VP/Dean of Students for further action.

Additional Help:

See TAs during posted hours. The [Center for Academic Success](#) has many programs to help students improve their study habits and time management. The [Dean Of Students Office](#) helps students who have personal or medical issues that impact their academic performance.