ECE 2020-B Syllabus | Fall 2026 | MW 5:00 pm to 6:15 pm

Instructor: Dr. William H. Robinson <wrobinson3@gatech.edu>

Office hours: By appointment.

Course Description: ECE 2020 introduces the many levels of abstraction that enable today's digital systems. It explores digital design at the layers from switches and wire to a programmable machine. At each layer, the design process of transforming a specification into an implementation is introduced and practiced.

Course Objectives and Outcomes:

- Understand Boolean logic and be able to produce desired logic functions in truth-table, schematic, and algebraic forms.
- Understand physical implementations of digital logic, be able to produce logic functions using it, and analyze its timing behavior.
- Understand how numbers are represented and manipulated in digital logic.
- Understand basic digital building blocks such as multiplexers and encoders, and be able to use them to build larger digital devices.
- Understand digital storage elements and sequential logic and be able to create finite state machines to implement a desired behavior.
- Understand basic processor operation and be able to create simple programs in assembly code.

Main textbook: Wakerly, Digital Design: Principles and Practice 5th Edition

Supplemental textbook: Harris & Harris, Digital Design and Computer Architecture (available through library)

Supplemental textbook: Wills & Wills, Digital Computer Systems (free e-book)

Website: http://ece2020.ece.gatech.edu/

Under construction website update: http://ece2020.ece.gatech.edu/new/

Required supplies: None

Grades and Assignments:

Letter-grades: A≥90.0%, B≥80.0%, C≥70.0%, D≥60.0%.

- Final exam (30%)
- 4 tests (12% each)
- Homework (6%)
- 2 hands-on labs (5% each)
- Participation assignments (6%).

Real-time in-person lecture attendance is expected. If you miss a lecture with a valid excuse, send me an email to check what you missed that day.

Grades will be recorded using Canvas. Contact me if anything on Canvas is incorrect.

- **Homework:** There will be a homework assignment approximately every 1-2 weeks. Homework is meant to build both basic knowledge of the course material and deeper understanding, so it is likely

that some additional research beyond coming to class will be required. Solutions will already be available, so homework is graded for completion.

- **Tests:** In-class tests will be given four times during the semester. Each test will take 55 minutes, to allow for setup and wrap-up and possibly some discussion before the test within the 75-minute class period. Tests are graded for correctness, with partial credit awarded for partial answers (e.g. work shown) or to account for minor errors. Test grades may be curved up if necessary.
- **Final exam:** The final exam will be at the date, time, and location scheduled by the institute. It is cumulative through the first three tests (i.e. no memory, computer architecture, or programming).
- **Hands-on Labs**: There are two labs during the semester which will each have some lecture time dedicated to them and will require additional time to complete outside of lecture. Students will be provided with pre-lab assignments and lab instructions prior to the in-class periods. A laptop will be required to utilize the in-class time.
- **Participation assignments:** Examples of assignments in this category are:
    - In-class questions designed to assess understanding of current material. These will be open-notes, so it is recommended to bring previous notes to class. Point Solutions might be used.
    - In-class attendance confirmation; e.g. questions graded for completion.
    - Online reading or videos, likely with associated short quizzes to assess understanding.
    - Anything else that you get credit for but doesn't fit in the other categories.

Late Submission:

- **Homework**: If unexcused, cannot be submitted late. Complete homework well before the deadline so that any problems can be fixed before it's too late. Email me with excused delays to work out submission details.
- **Participation**: With a valid excuse, the grade will be dropped from the grade calculation. Assignments missed without a valid excuse will be a 0.
- **Tests**: With a valid excuse, tests can be made up for full credit as soon as possible. Tests missed without a valid excuse can be made up as soon as possible with a penalty of up to 20% per day (adjusted based on ability to make up the test). Make-up tests may be different than the original and might not receive the same curve.
- **Labs**: Labs are due one week after the in-class period. If the in-class portion is missed or is not completed within the lecture period, the lab must be finished outside of lecture. Late submissions will not be accepted beyond the one-week period.

Accommodations for Students with Disabilities:

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or http://disabilityservices.gatech.edu/ as soon as possible to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible to set up a time to discuss your learning needs.

Grade Disputes

Requests to regrade any assignment must be made within one week of the assignment being returned. In the event of a regrade, the entire assignment may be regraded.

Communication

There will be a Piazza section set up and linked to Canvas. That is the preferred place to ask technical questions so that everyone in the class can see the answer (or answer themselves) and ask follow-up questions in the same place.

If you need to contact me for non-technical reasons (course logistics, scheduling meetings, etc.), I prefer email but it is also possible to message me through Canvas. If I need to contact you personally, I will use your GT email address.

Announcements will be sent through Canvas. You are responsible for information sent in those announcements, so I recommend configuring Canvas to notify you of them.

Academic Honesty

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectations that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

<u>You may not:</u>

- Collaborate at all during tests and in-class quizzes, unless otherwise specified.
- Share solutions to any assignment before its due date.
- Discuss tests until they have been returned, in case someone has not taken it yet.
- Use or reference lab work from previous semesters.

<u>You may:</u>

- Work with instructors, tutors, and other students to discuss course material, including current homework and lab problems, as long as solutions are not shared.
- Use previous semesters' exams, homeworks, or other resources, from my 2020 sections, from other 2020 sections, from the general 2020 website, or from other sources.
- Use CAD or simulation software such as http://lushprojects.com/circuitjs/circuitjs.html .

Course Schedule

A general course schedule, including test dates, is available in a separate document on Canvas.