ECE 3710 Syllabus

ECE3710 – Circuits & Electronics (2-0-2)

Prerequisites: Physics II, Calculus 1&2

Fall 2026

Instructor Information

Instructor: Michael West

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General Course Information

Description

As a non-electrical engineer, by the end of this course, you will have the necessary tools to confidently analyze basic-level analog, digital, and filter circuits. You will learn how voltage, current, power, and other characteristics play a role in the function and behavior of circuits filled with resistive, reactive, amplifier, switch, and other types of elements. You will also gain hands-on experience with designing and measuring the performance of circuits. By the end of the class, you will be able to explain the current, voltage, and power characteristics of first-order circuits of resistors, capacitors, inductors, amplifiers, switches, diodes, and logic gates.

Course Learning Outcomes

1) Utilize circuit laws and analyses to determine the direct current (DC) and alternating current (AC) voltages and currents of any circuit element in resistive networks and first-order circuits (containing resistors, capacitors, inductors, operational amplifiers, and diodes)
2) Derive and sketch the transient responses of first-order circuits
3) Calculate the voltage, current, and power relationships between the inputs and outputs of transfer functions of first-order circuits
4) Sketch the voltage magnitude and phase relationships of transfer functions via linear scale and Bode plots
5) Design and analyze first-order filter circuits (highpass, lowpass, bandpass, and notch) through simulation
6) Derive and sketch the inputs and outputs of different types of diode circuits

Required Course Materials

- *Circuits* by Fawwaz Ulalby & Michel Maharbiz

- Textbook is mentioned only as an *optional* supplemental material. Your course instructor's lecture notes refer to the lesson-videos, the internet, and/or their undergraduate course lecture notes.

Grading Policy:

- Canvas Lesson-Video Quizzes (5%)
- In-class Worksheets (5%)
- Homework (15%)
  - Linear Circuits 1: DC Analysis HW (5%)
  - Linear Circuits 2: AC Analysis HW (5%)
  - Intro To Electronics HW (5%)
- Lab Worksheets (15%)
  - Total of 6 Labs
- Exams (60%)
  - Exam1 on Linear Circuits 1:DC Analysis
  - Exam2 on Linear Circuits 2:AC Analysis
  - Exam3 on Introduction to Electronics
    - There is no final exam for this course

Grading Scale (rounding to the second decimal place):

- A = 90.00 – 100.00
- B = 80.00 – 89.99
- C = 70.00 – 79.99
- D = 65.00 – 69.99
- F = Below 64.99

Description of Graded Components

1. **Canvas Lesson-Video Quizzes (5%)**
   Regardless of your specific section, you will be assigned Canvas Lesson-Video Quizzes. These quizzes will be accessible via Canvas ECE3710-SectionSpecific page in the first 5 minutes of every non-lab class day and utilized to assess if you have grasped the concepts covered in the lesson-videos. By reviewing the statistics of the responses, instructors can enhance their review of the lesson-video content to address any needed clarification.

2. **In-Class Worksheets (5%)**
   Regardless of your specific section, you will have an assignment affiliated with your Worksheet grade in your ECE3710-SectionSpecific page. Your section-specific GSI has the freedom to decide how you will access your worksheets, how you will be graded on your worksheets, how your grades will be reflected in your section-specific Canvas page, and how they will handle late submissions. They will explain these details on the first day and second day of class.

3. **Homework and Submissions (15%)**

Homeworks (HWs) are assigned as problem sets of practice problems regarding weekly-covered course material. You can find the problems in the format of online quizzes, which appear in the modules along with the lesson-videos in the Canvas ECE3710-EX's Module page. In these quizzes, you will be assigned problems and submit your numerical value and/or multiple choice answers. You have 3 HWs (problem sets) in this course; one for each mini-course (mentioned in the above Course Structure section). The due dates of the HWs are shown at the end of the syllabus, and thus have been mentioned well in advance.

- Unless you have a note from the Dean of Students, Department of Athletics, or a doctor, late homework submissions will not be accepted.

4. **Labs documents and Submissions (15%)**

Completed lab documents must have recorded measurement values and answers to conceptual questions regarding the content covered in its lab procedure section. You can complete the lab documents digitally (e.g. on tablets, laptops, etc.) or on paper. Each student is responsible for submitting their own completed, lab documents via the lab assignment portals on Canvas ECE3710-EX. Labs are graded out of 10 pts. The due dates of the labs are shown at the end of the syllabus, and thus have been mentioned well in advance.

- Late submissions are allowed with the following late penalty system: 10% penalty per late day (e.g. a 3-day late submission means your maximum achievable lab grade is 7 pts). Unless you have a note from the Dean of Students, Department of Athletics, or a doctor, the late penalty system will be applied to your lab submission.

5. **Exams and Make-ups (60%) (Exam format may change based on room availability)**

Exams will contain 5-10 short answer questions and 2-3 circuit problems which will contain 3-6 computational questions regarding the content covered in the mini-course. There are total of 3 exams (one per mini-course). None of the exams are cumulative, but several course content will overlap amongst several mini courses (e.g. voltage divider law may be needed to calculate an answer in all three exams). The exams will be conducted remotely through Gradescope. You will have 24 hours to start the exam. Once started, you will have two hours to complete. All 3 exams are open book and open notes. However, they should be completed individually. In addition, no internet shall be used to search for answers. The exam dates are shown at the end of the syllabus, and thus have been mentioned well in advance.

- Each exam will cover all videos (except for optional-labeled videos) affiliated with each mini-course; Linear Circuits 1, Linear Circuits 2, and Intro to Electronics
- *We strongly recommend you also watch the sample problem tutorial videos as these provide in-depth explanations on the how and why of solving circuit problems with the use of circuit fundamentals*.
- With a letter from the Dean of Students, Department of Athletics, or a doctor, students are responsible for contacting their course instructor ASAP if they need to

reschedule and make-up an exam. Unless you have a note from the Dean of Students, Department of Athletics, or a doctor, late exam submissions will not be accepted.

Course Policies

Attendance and/or Participation

Attendance is not required, but you are responsible for earning your Lesson-Video Quiz grade and Worksheet grade (see Grading Policy and Graded Assignments for more information), so please ensure you understand how your section-specific GSI grades your worksheet portion of class. We understand there are different preferred learning styles and speeds, but if you want to complete practice problems with your instructor/class and receive real-time feedback on your approach to completing problems, then we strongly suggest you attend class and participate.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct.

Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Core IMPACTS

Core IMPACTS is the University System of Georgia's General Education curriculum. If you are teaching a course that counts towards Core IMPACTS, you should include a syllabus statement about the Core area and associated career competencies. This resource developed by the Center for Excellence in Teaching and Learning and Online Education at Georgia State University includes template syllabus statements for each of the Core IMPACTS areas that you may adapt for your course.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) 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 in order to set up a time to discuss your learning needs.

Student-Faculty Expectations Agreement

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. The Student-Faculty Expectations articulate 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.

Campus Resources for Students

Undergraduate Student Academic Success Resources:

- Academic Support: Academic Success and Advising (a unit in the Office of Undergraduate Education & Student Success) provides free support for your courses. Students can attend scheduled supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283.

Student Well-Being:

At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being (student-resource-guide (gatech.edu)