

Syllabus: EEL 3111C Circuits I

Term: Fall 2018

Credits: 4

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Office Hours: see Canvas

Teaching Assistants: Listed on Canvas

General Description: The topics in this course are part of the fundamental theory of electrical engineering and provide depth in the analysis, design, and implementation skills in those areas of electrical engineering needed to solve problems in the domain of electrical engineering.

Course Format: The format for the course consists of on-line lectures, class periods and laboratories. Students will be required to watch one lecture on-line and take an on-line quiz (Quiz 1) before the class (system will be closed at 7:25AM of the class day). During class, students will work within teams to solve problems provided by the instructors. Prior to the labs, students are required to complete and submit the prelab on-line. During labs, students will be completing experiments utilizing the material from the lectures and class periods.

Objectives: After successful completion of this course, the student will have a basic understanding of:

- Definitions and units of basic electrical quantities
- Ohm's law and Kirchoff's laws and series and parallel dc circuit analysis
- Dependent sources, input and output resistances, and operational amplifiers
- Mesh, loop and nodal analyses of general dc resistive and op-amp circuits
- DC network theorems and bridge circuits
- Use of SPICE for DC circuit analysis
- Capacitors and inductors
- First-order transient analysis of RL and RC circuits
- Use of SPICE for transient analysis
- Sinusoids, phasors, phasor circuits, impedance and admittance
- Nodal, mesh and loop analyses of general ac circuits
- Network theorems applied to ac circuits; SPICE applied to ac circuits
- Bode plots and use of SPICE to obtain frequency-response plots
- Average power, RMS values, apparent power and complex power
- Diodes
- Analyze circuits using Digilent Board

Required:

- **A calculator** that can perform calculations with complex numbers in polar as well as rectangular form in matrices. If you plan to purchase a new one, we recommend the TI-Nspire CX CAS.
- **Digilent Analog Discovery (DAD)*, a breadboard and wires.**

*The Digilent Analog Discovery (DAD) board **or** National Instruments Analog Discovery (NAD) board is **REQUIRED** for this course (and many other ECE courses). A Digilent Analog Discovery for this course can be purchased from the UF bookstore. A separate wiring and breadboard kit can be purchased at the bookstore, too. For those who wish to use financial aid or want it right away, the bookstore will be carrying the NAD at a slightly elevated price. Board ordering information for the DAD can be found at: <http://store.digilentinc.com/analog-discovery-2-100msps-usb-oscilloscope-logic-analyzer-and-variable-power-supply/>. Board ordering info about the NAD can be found at <http://sine.ni.com/nips/cds/view/p/lang/en/nid/213328>.

Note:

To get the \$179 price for the Digilent Analog Discovery Board (DAD), select "Get Academic Pricing" ****BEFORE**** selecting the item at <https://tinyurl.com/DAD-UF-f18>. You will need to register using your ufl email.

To get the \$179 price for the National Instruments Analog Discovery Board (NAD), select "Analog Discover 2 – Student Only" at <http://tinyurl.com/NAD-UF-f18>. You will need to make an account and use your ufl email to get this pricing.

- **Text:** *Electric Circuits*, latest or earlier editions, Nilsson and Riedel, Prentice Hall

Tests and Quizzes:

There will be 4 tests on the tentative dates shown on the posted schedule, daily and weekly quizzes prior to and during class. The tests will be given in the evening starting at a time, and in a room, that will be announced later by Canvas announcement or UFL email. Weekly Quizzes (Quiz2) will be given at the end of class according to the schedule posted on Canvas. **Use of cell phones during class is cause for an immediate zero of quiz 2 for that section.**

Lab:

Labs start at the third week of class and your section time will be determined by the end of the first week through an on-line survey. All labs take place in NEB 250 and lab instructor office hour times and locations can be found on the course's canvas page.

The laboratory portion of the course is made up of nine labs and a final project. Each lab has a pre-lab, pre-lab quiz, in-lab portion, and a write up. Labs occur every week until the end of the semester, see the lab schedule (subject to change) in the lab rules and policies.

Labs are 15% of the total course grade which is broken down to 10% for every lab and 20% for the final project, giving a total possible score of 110% for the lab portion of the course. A minimum score of 70% is required in labs in order to pass the course.

All labs have a strict attendance, submission, and completion policy:

- **Failure to complete the pre-lab submission, pre-lab quiz, and in-lab demonstration on time, will result in a zero for the entire lab.**
- **Arriving more than 5 minutes late to the start of lab will result in the student being barred from completing the lab and receiving a zero for the entire lab.**
- **Failure to submit write ups on time will also result in a zero for a given write up, but not the entire lab. No late work is accepted.**

Making up labs is on a case by case basis and are generally only offered for reasonable excuses. The following are not reasonable excuses:

- **Missing the lab time because of a confusion between period numbers and period times.**
- **Arriving late to lab because of a confusion about the start time.**
- **Skipping lab to attend a review session or study for a test.**

Grading:

The grading scheme presented here reflects the requirements that students must be successful in all aspects of the material to pass the course. To that end, students must fully attend at least 85% of the classes to pass the course. Arriving late, or leaving early, will count, at a minimum, as half an absence. **No excuses of any kind are required or will be allowed, the 15% of allowed absences will cover any and all reasons for absence.** Also, students must earn a lab score of 70% or higher to pass the course. Rules for homework and lab information will be available in Canvas.

For those students who have fully attended at least 85% of the classes and earned a passing lab score their grades will be based on the following equation. Grade = 85% theory + 15% laboratory.

The weighted test score, T , will be calculated as follows.

$$T = \frac{((0.1)T_L + (0.18)T_M + (0.18)T_H + (0.24)T_4)}{0.7}$$

Where T_L , T_M and T_H represent the Lowest, Middle and Highest test scores for each student and T_{FE} is the final test score.

Quiz one (Q_1) will be given on-line before the class to insure the student watched and understood the video lecture. Quiz two (Q_2) will usually be given at the end of a class each week on the material covered in the class to that point. To determine the overall score for each of the quiz types; for Q_1 we will drop 15% of the lowest scores, and for Q_2 we will drop 15% of the lowest scores. Attendance will be taken twice daily. Students arriving late or leaving class early will have all quiz scores for the day reduced to zero.

The overall score, S , for the course will be calculated as follows assuming that HW represents the overall homework score, L the overall lab score.

$$S = (.85)(.06Q_1 + .06Q_2 + .06HW + .82T) + (.15)L$$

The overall score will then be used to determine the course grade based on the University of Florida standard as shown in the table below.

Overall Score	Grade
92.5-100	A
90-92.499...	A-
87.5-89.99...	B+
82.5-87.499...	B
80-82.499...	B-
77.5-79.999...	C+
72.5-77.499...	C
70-72.499..	C-
67.5-69.99...	D+
62.5-67.499...	D
60-62.499...	D-
Less than 60	E

Important:

All students need to check their UF email and Canvas web pages daily at a minimum to keep up to date with the class and lab. Excuses such as “I didn’t know because I did not check my UF email or Canvas” are not accepted.

Academic Honesty: As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty, and understand that my failure to comply with this commitment may result in disciplinary action, up to and including expulsion from the university."

Software Use: All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Such violations are also against University policies and rules, and disciplinary action will be taken as appropriate.

University of Florida Counseling Services: Resources are available on campus for students having problems or lacking clear career and academic goals which interfere with their academic performance. These resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling.
- Student Mental Health, Student Health Care Center, 392-1171, for personal counseling.
- Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, for sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development