EE 302: Introduction to Electrical Engineering
Fall 2016

Course: EE 302; Unique Numbers 16120, 16125, 16130
Lecture: TTh 12:30 PM – 2 PM in BUR 136
Final Examination: Thursday, December 8, 2016, 9 AM to 12 PM

Lab Schedule
Location: ECJ 1.314
The labs are conducted by the Teaching Assistants

Unique Number	Day	Time
16120	M	9 – 11 AM
16125	M	11 AM – 1 PM
16130	M	1 – 3 PM

Instructor
Dr. Al Cuevas, Email: Use Canvas to e-mail
Office Hours/Location: T/TH 11am to 12:15pm AHG 126; T/TH 3:30pm to 4:45pm AHG 126; or
M-TH Weeknights, from 6:30 to 7:30pm by appointment using Google Hangouts

Teaching Assistants
To be determined

Required Text and Equipment
F.T. Ulaby, M.M. Maharbiz, & C.M. Furse, Circuits (National Technology & Science Press, Third Edition, 2016).
National Instruments myDAQ (sold in bundle with Circuits text)

Supplementary References
C.K. Alexander and M.N.O. Sadiku, Fundamentals of Electric Circuits, Fifth Edition (McGraw Hill, 2012).
P. Horowitz and W. Hill, The Art of Electronics, Third Edition (Cambridge University Press, 2015).
J.W. Nilsson and S.A. Riedel, Electric Circuits, Tenth Edition (Prentice Hall, 2014).

Course Website
Web-based, password-protected class sites are associated with all academic courses taught at the University. Electronic class rosters are a component of the sites. Students who do not want their names to be included in these electronic class rosters must restrict their directory information in the Office of the Registrar, Main Building, Room 1.

The cloud-hosted learning management system, Canvas, will be used throughout this course. Canvas is located at https://utexas.instructure.com/

Course Description
This course provides an introduction to some of the central elements of electric circuits, their application, and related issues. Topics covered will include the following: the scientific method, and general tools and approaches for problem-solving and analysis; fundamental physical phenomena and their connection to electrical systems; analysis and applications of analog resistive circuits, including Kirchhoff's Laws, nodal and mesh analysis, Thévenin and Norton equivalents, and operational amplifiers; and technological, societal, and ethical issues that arise in electrical engineering. Substantial teamwork experience is included in the laboratory component of this course. The course will help students to build and understand the intellectual foundations that underlie much of electrical engineering, and to establish and appreciate connections between electrical engineering and basic sciences, mathematics, and liberal arts.

This course may be used to fulfill the natural science and technology (Part II) component of the university core curriculum and addresses the following four core objectives established by the Texas Higher Education Coordinating Board: communication skills, critical thinking skills, teamwork, and empirical and quantitative skills.

Prerequisite
Completion of or concurrent enrollment in Mathematics 408C or equivalent is required.

Attendance
You are expected to attend each and every lecture and lab session.

Grading Policy

Homework	10%	A=90% - 100%
Laboratory	15%	B=80% - 89%
Project	5%	C=70% - 79%
Semester Exams	40%	D=60% - 69%
Final Exam	30%	F=0% - 59%

Semester Exams: Three semester exams, 70 minutes each, will be given on the dates/times below.
Semester Exam 1: On or about 09/27/2016, During class time
Semester Exam 2: On or about 10/25/2016, During class time
Semester Exam 3: On or about 11/22/2016, During class time

The best two Semester Exams count 20% each. You are strongly encouraged to take all three exams as the problems build towards the Final Exam.

Your final course grade will be determined using these course components and weightings. Because only your best two semester exams are counted, makeup exams will be given only under extraordinary circumstances and at my sole discretion. Per University policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence. Class attendance is not considered explicitly in computation of your course grade, but is strongly recommended as an important part of your learning process.

Each course component will be graded on a curve, rather than an absolute scale, for translation of numerical to letter grades. This will almost certainly result in your receiving a higher letter grade than if the traditional absolute scale were employed. Final grades will be assigned using plus and minus grade increments.

Notes on exam grading: For exam problems, reasoning and analysis are typically as or more important than the final answer. You should explain your reasoning clearly and show all work. Be sure to erase or cross out any work you do not want to be considered in grading. If you demonstrate mastery of the key concepts required to solve a problem, you will receive substantial credit even if the final answer is not completely correct. Conversely, a correct final answer without explanation or justification will typically receive very limited credit. Any requests for exam regrades must be made in writing with an explanation of the issue in question, and within one week of your receiving your original graded exam. If an exam regrade is requested, the entire exam may be regraded and your total score may increase or decrease.

Drop Policy
All adds and drops should be discussed with your academic advisor. The fourth class day is the last day of the official add/drop period. Drops after this time must be approved by the Dean’s office.

Policy on Collaboration
Discussion of course material and homework problems is permitted (and encouraged!). However, each student should work through the homework problems (and write up his or her solutions) independently. For additional details please see the section of this syllabus on Policy on Academic Integrity.

Policy on Academic Integrity
Ethics and integrity in both academic and professional affairs should be part of your education at UT Austin. University policies on scholastic dishonesty will be strictly enforced. Students who violate University rules on scholastic dishonesty (including, but not limited to, cheating, plagiarism, collusion, or falsifying academic records) are subject to disciplinary penalties, including failure in the course or dismissal from the University. Academic integrity is a serious matter and will be treated as such in EE 302. My hope is that this will be beneficial to your education both technically and in a much broader sense. While I am confident that the large majority of students will naturally adhere to the university's guidelines and regulations regarding academic integrity, I provide below an explicit statement of course policy in this regard. Additional information concerning UT Austin's policy on academic integrity is posted on the UT Austin web site at: http://deanofstudents.utexas.edu/conduct/

Homework
EE 302 course policy is that discussion of course material, including homework problems, is allowed and indeed encouraged. However, each student should work through assigned homework problems and write up his or her solutions independently. Problem-solving is an extremely useful skill in itself, and in addition is the only really effective way to learn the material! Specifically, each student is responsible for working out and writing up his or her own solutions to each homework assignment. Discussion of the course material and problems is encouraged, but practices such as allowing a classmate to copy your homework solutions, or a group working out a problem solution together which everyone then copies down and turns in, are forbidden. Use of problem solutions obtained from other students, over the web, etc. is forbidden. Students violating course policy on homework will receive a warning possibly followed by a grading penalty and further disciplinary action, in accordance with university policy.

Homework assignments are intended to give you practice in problem-solving, and to enable you to apply and further explore concepts and techniques introduced in lecture and/or assigned reading. Typically there will be one homework assignment per week, except during weeks for which an exam is scheduled. Homework assignments are due in class, at the beginning of lecture, on the assigned due date. Late assignments will not be accepted except possibly in cases of serious, documented illness. Please see the sections of this syllabus addressing Policy on Collaboration and Policy on Academic Integrity for information on working with your classmates on homework assignments

Examinations
In general you will be allowed to use a calculator, writing implements and erasers, and blue books during exams. No other materials will be allowed. Students who are caught using unauthorized materials during an exam, copying from a classmate on exams, continuing to work on an exam after time has been called, or violating exam or course rules in some other manner are likely, at a minimum, to receive a score of zero on that exam and may be subject to further disciplinary action, again in accordance with university policy.

Laboratory
The laboratory sessions for this class meet once per week for two hours at the times indicated for your section, in ECJ 1.314. All students are required to purchase a National Instruments myDAQ for use in the lab. This measurement device will also be used in subsequent courses in the curriculum. The instructor for the laboratory component is your TA. All lab issues, including lab grading, should be discussed with your TA. Participation in all lab sessions is required except for documented illness or religious observance approved in advance. Per University policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day.
Laboratory sessions will start the week of 08/29/2016. The laboratory manual will be available online, and printed copies will be available for purchase from HKN (http://hkn.ece.utexas.edu).

Project
The project for this course is designed to allow you to learn more about the engineering profession. The project consists of a series of assignments that are due on specified dates throughout the semester. Details will be provided in a separate handout and on the class web site.

Accommodation for Religious Observances
By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence. If there is uncertainty regarding the precise date of a religious observance due to lunar cycles, etc., you still must inform me at least 14 days prior to the earliest possible date of the observance and provide the probable range of dates for the observance.

Students with Disabilities:
Upon request the University of Texas at Austin provides appropriate academic adjustments for qualified students with disabilities. For more information, contact the Division of Diversity and Community Engagement, Services for Students with Disabilities at 512-471-6259 or http://diversity.utexas.edu/disability/

If you feel you may be entitled to accommodation under these policies, please consult with the appropriate offices early in the semester. Evaluation and approval take time, and typical adjustments cannot be applied retroactively.

Sources of Help
Like most engineering courses, EE302 builds knowledge in a rapid step-by-step process throughout the semester. Each step assumes you have mastered the prior material. If you fall behind by even a few days, it can be difficult to catch up. If you do not understand something, ask questions in class, come to office hours, and/or take advantage of the other sources of help that are available. Get help quickly; do not wait! UT also provides resources to help you with nonacademic issues. A search of the UT website is often a good place to start.

The best way to get help from the instructor is during office hours. If you would like to meet outside scheduled office hours, it is generally best to arrange a time and location with me in advance. Email is typically the best way to reach me. Please mention EE302 in the subject of any email.

Any professor teaching EE302 will also be available to help you during their normal office hours. The EE honor society, HKN, provides free tutoring for Basic Sequence ECE courses including EE302 on Tuesday and Thursday from 7:00 PM to 9:00 PM in the HKN office. They also provide limited assistance with basic math and science courses. HKN has a help desk service where you can “ask anything about anything”; just drop by their office at anytime. Their web page is http://hkn.ece.utexas.edu/

The UT Sanger Learning Center provides free tutoring in JES. Consult their website for hours of operation and programs. The UT Sanger Learning Center also provides one-on-one tutoring free or for a reasonable hourly charge. Visit their web page at http://ugs.utexas.edu/slc

The ECE Undergraduate Student Advising Office, is the best place to start if you have issues related to advising, registration, add/drop, or issues with the UT bureaucracy in general. The Engineering Student Services and Advising (ESSA) Office in ESS can assist with many issues. Their web page is http://www.engr.utexas.edu/undergraduate/advising

Emergency Preparedness and Classroom Evacuation Instructions
Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside. Familiarize yourself with all exit doors of each classroom and building you may occupy.

Remember that the nearest exit door may not be the one you used when entering the building. Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class. In the event of an evacuation, follow the instruction of faculty or class instructors. Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.

Lecture and Exam Schedule

Date	Topic/Event	Reading (Ulaby & Maharbiz)	Homework
8/25	Introduction and Overview	Chapter 1	
8/30	Introduction (cont'd.) and basic concepts		
9/1, 9/6	Circuit terminology and concepts		HW 1
9/8, 9/13	Circuit topology, Kirchoff's Laws	Chapter 2	HW 2
9/15, 9/20	Simple equivalent circuits and transformations		HW 3
9/22	Circuit analysis examples		
9/27	Semester Exam 1		
9/29, 10/4	Nodal analysis	Chapter 3	HW 4
10/6, 10/11	Mesh analysis		HW 5
10/13, 10/18	Superposition		HW 6
10/20	Additional techniques and examples		
10/25	Semester Exam 2		
10/27, 11/1	Thevenin and Norton equivalent circuits		HW 7
11/3, 11/8	Power transfer		HW 8
11/10, 11/15	Operational amplifiers and op amp circuits	Chapter 4	HW 9
11/17	Operational amplifier circuits		
11/22	Semester Exam 3		
11/29, 12/1	Operational amplifier circuits; additional topics		HW 10
12/8	Final Exam – 9 AM to 12 PM		

Helpful Prerequisite Knowledge

To master the material in EE 302, it will be important for you to have a strong working knowledge of pre-calculus- level mathematics and high-school-level physics. In addition, you are required to have completed or be concurrently enrolled in M 408C (Differential and Integral Calculus) or its equivalent. The basic topics you will find helpful to understand, and the ideal level of understanding, are as follows. We will discuss many of the ideas listed under "Physics" below, but prior familiarity with them will still be helpful.

1. Mathematics
    a. Excellent proficiency with elementary algebra
    b. Good proficiency with linear, polynomial, exponential, and logarithmic functions
    c. Some proficiency with systems of linear equations and (ideally) matrices
    d. Basic knowledge of differential calculus by mid-semester, and integral calculus by late-semester
2. Physics
    a. Some familiarity with basic concepts of charge, current, voltage, and resistance
    b. Some familiarity with basic concepts of energy and power
    c. Some familiarity with proper use of significant figures in calculations
    d. Some familiarity with proper use and essential nature of units in calculation of physical quantities
    e. Some familiarity with concept of physically "reasonable" quantities