EENG 2611 - Circuit Analysis Lab

Course Description:
The course supplements the material of Circuit Analysis EENG 2610, providing practical hands-on experience with circuit implementation and analysis using Multisim and MATLAB to verify and test fundamental laws and analysis methods.

Reference:
J. O. Attia, *PSpice and MATLAB for Electronics: An Integrated Approach*, 2nd ed., CRCpress, 2010.
J. D. Irwin and R. M. Nelms, *Basic Engineering Circuit Analysis*, 11th ed., Wiley, 2015. (suggested)

Course Outline:

Session 1.....: Introduction to the Laboratory
Session 2.....DC Circuit Basics
Session 3.....Nodal and Mesh Analysis
Session 4.....: Additional Analysis Methods
Session 5..... Operational Amplifiers
Session 6.....Inductors and Capacitors, RL and RC
Session 7..... OpAmps with Capacitors, RLC
Session 8.....AC Circuit Basics
Session 9.....AC Circuit Analysis
Session 10.....Frequency Response and Filters

Grading:
Lab Reports 100%

Course Policies:

- Usually, you'll have one week to submit the lab report through the portal on Canvas, and ***it should be in the PDF or Word format***. Please check Canvas regularly for the specific deadlines. For the implementation problems (circuit building), you and your teammate could attach the same photos. However, for other types of questions, you should work independently (see the announcement on Canvas for details).
- **1 week late will be penalized 30%, 2 weeks late, the score is 0**. If you are unable to complete the lab report in time, please send me an email before the deadline for an extension.

Canvas: Course material and grades will be maintained on the course Canvas site. You should check this page often to keep current on important information. *https://unt.instructure.com*

Rights and responsibilities:

- Students are expected to communicate with the instructor any issues regarding their performance in class ahead of time.
- **Attendance** is required and will be recorded for each class. Students aware of an authorized absence (religious observance, military service, official university function, etc.) should notify the instructor as soon as possible according to UNT Policy 15.2.5.
- Students with disabilities should inform the instructor of their needs at the beginning of the semester, according to UNT Policy 18.1.14 in order to receive proper attention and accommodations.

- Cheating and academic dishonesty will not be tolerated. Any student found to have participated in academic dishonesty will receive an F in the class and may be subject to further disciplinary action. Acts of academic dishonesty include: academic fraud (e.g. changing solutions to appeal a grade), copying or allowing one's work to be copied, fabrication/falsification, plagiarism, sabotage of others' work, substitution (e.g. taking an exam for someone else). For more details, see UNT Policy 18.1.16.
- Letter grades will not be assigned until the end of the term. Any letter grade assignment posted before the end of the class should be regarded as tentative and subject to change.

Missed Labs

- There are **no** make-up Labs. Make-up lab accommodations will only be made if you have a documented university-excused absence (refer to UNT Policy 06.039).

Grade Distribution

Points Letter Grade
90.0% - 100% A
80.0% - 89.9% B
70.0% - 79.9% C
60.0% - 69.9% D

59.9% & Below F

Student Evaluation of Instruction

SPOT is a requirement for all organized classes at UNT. The survey will be made available at the end of the semester.

UNT Policies

ODA Policy

UNT makes reasonable academic accommodations for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member before implementation in each class. For additional information see the ODA website (https://disability.unt.edu/).

Academic Integrity Policy

According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)

The University of North Texas (UNT) prohibits discrimination and harassment because of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

Lab Reports Guideline

1. *First page header* • Course name, title, and number of the lab session, your name, your mount email address, and the date of submission

2. *Contents*
• Section 1: Introduction: learning objectives and description of the lab session
• Section 2: Theoretical background, approach, analysis, lab procedures
• Section 3: Solutions for the exercises. Results and observations. Applies to both hardware and software.
• Section 4: Discussion and conclusions.

Remark
• You may title sections differently in different reports.

• Lab report must be prepared using MS Word or other similar word processing software and converted to a **single** PDF document

• You will submit the PDF electronically using Canvas**.**

• For more information refer to the *Guidelines and Standards for Writing Assignments from the ECE Department, Rose-Hulman Institute of Technology.*

Grading System

Your report will be graded on the following system:
Section 1: 1 point
Section 2: 1 point
Section 3: 7 point
Section 4: 1 point

For pre-labs, please bring to the class and submit to TA before class begin.

Simulation Tools

1. https://dcaclab.com/en/lab （online）
2. https://www.circuitlab.com/editor/#（online）

Multisim

Multisim Live. https://www.multisim.com/.

Download Multisim (optional):https://www.ni.com/en-us/support/downloads/software-products/download.multisim.html#312060

Computation Tools Matlab

MATLAB OnlineAfter obtain license from UNT we can access the MATLAB Online.https://www.mathworks.com/products/matlab-online.html

DownloadMATLAB (optional)1. Visit theMathWorks portal; 2. Sign in to get started with your EUID3. Sign in your MathWorks Account (or Create a new one); 4. Download and install R2020a (or the latest version)