University of Nevada, Las Vegas
Department of Electrical and Computer Engineering

EE 221 Circuits II

Laboratory

Prepared and Updated by

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Overview

Class meets: Friday 2:30pm-5:15pm at TBE-B350/B311
Class materials website: http://eelabs.faculty.unlv.edu/

Instructor: Dr. Ming Zhu
Contact: (Email) ming.zhu@unlv.edu (Phone) 702-895-0995
Office/Hours: TBE-B338, walk-in/email appointment

TA: 1001/1002: Lihao Qiu qiul1@unlv.nevada.edu
Office hours: Thursday 1-4pm, TBE-B309

Introduction

This lab course will introduce you to the principles of electrical/electronic system design with relatively low complexity, helping you better understand what you have learned in the lectures. Various circuit design, simulation and implementation techniques and tools/software will be presented. You will practice soldering electrical parts onto the PCB as well. Finally, you would be required to build a final project based on simulations, breadboards or printed circuit boards (PCBs).

Course Outcomes

Upon completing EE 221L, students will be able to:

1. Properly use of the electronic test equipment found in a common laboratory setting. This includes function generators, multi-meters, and oscilloscopes
2. Use SPICE for circuit modeling, design, analysis and to verify their calculations
3. Apply circuit design techniques and component specifications as they relate to physical circuit design
4. Have a grasp on the origins of difference between simulation results and measurements results of physical circuits
5. Utilize the results of the experiments along with the applications provided to solve real world problems.

Grading:

Prelab	20%
Attendance & Completion of Experiments	30%
Postlab	30%
Final Project	20%
Total	100 %

Lab Topic & Schedule

Week (Date)		Lab #	Topic
1	01/24/25		Introduction & Lab Safety
2	01/31/25	0	Lab Equipment Use Tutorial
3	02/07/25	1	DC Circuits & LTspice
4	02/14/25	2	Tinkercad & Circuits on Breadboard
5	02/21/25	3	Ideal AC Circuits, Capacitors & Inductors
6	02/28/25	4	Practical AC Circuits, Capacitors & Inductors
7	03/07/25	5	Soldering Lab
8	03/14/25	6	Op Amp
9	03/21/25	Spring Break	
10	03/28/25	7	Linear Regulators
11	04/04/25	8	Electric Power Transformers
12	04/11/25	9	Frequency Response & Filter Designs
13	04/18/25	10	Final Project
14	04/25/25		
15	05/02/25		Presentation & Demonstration of Final Project
16	05/09/25	Study Week: JDC	
17	05/16/25	Final Exam Week	

Requirements

This class is scheduled above. Instruction videos will be uploaded at WebCampus Panopto Recordings so that you can watch videos any time in the week if the lab is remotely instructed, or prior to the class if in person.

Most labs require two laboratory write-ups (i.e., **Prelab** and **Postlab**). Prelabs include *screenshots and/or photos of critical steps* (e.g., hand calculations, circuit diagrams, simulation results, descriptions and analysis) required in each "Prelab"; while Postlabs include the *screenshots, photos and descriptions of the outcomes* of the "Lab Experiment" (e.g., program running outcomes, physical experiment outcomes, etc.) and answering the questions at the end. In the manuscript when you are asked to *"observe" the signals and/or "read" the values*, you are **REQUIRED** to take photos or write them down. Both Prelab and Postlab reports should be able to work as your future references and remind you of the key principles/operations in the experiment. Course syllabus/contents and guidelines for the lab reports are posted on the class website. You ***must*** follow the guidelines and use templates for Prelabs (if required) and Postlabs, if you wish to get the credit for the lab report. The Prelab is due the day before the lab class, while the Postlab is due one week after regular lab hours. For example, since EE 221L is scheduled on Friday, the Postlab is due on **next Thursday midnight 11:59pm**. You ***must* attend the class and complete the experiments** in class before submitting the Postlabs.

A course/lab related **final project** is required by the end of the semester. Presentation and

demonstration should be performed during the study week in person.

Carefully read lab experiment handouts prior to start of the lab. Any ambiguity encountered must be brought to the attention of the instructor and TA immediately.

All lab reports are due <u>within a week</u> after the experiment in softcopy (only .doc, .docx, .pdf are accepted) through UNLV <u>Webcampus</u>. Full grade for each report is 10pts. Late submissions will receive 1 pt off every week, as in the following table. Submissions after the Friday of the study week will NOT be accepted and will be counted as 0 pts.

Exceptions: If UNLV Webcampus is down or proper reason is justified, please submit reports to TA through email and copy to me. No hardcopy is necessary.

Submission	Maximum grade for each Postlab report (not counting bonus)
On due (Thursday 11:59pm)	10
Late within 1 week	9
Late within 2 weeks	8
Late within 3 weeks	7
Late within 4 weeks	6
By the Friday of study week	5
Afterwards	0

Prelabs/Postlabs file names syntax:

EE221L_RebelMailID_postlab_X.pdf. X is the number of the lab the Postlab is related to. All letters lowercase. Similar rule applies to prelab naming. Example for John Smith's Lab 1 Postlab:

EE221L_smithj_postlab_1.pdf

If the submission instruction states that the project files are required in the submission, then either:

- zip all the files and attach the project files as one zip archive
- zip all the files and send the link to the shared folder (such as Dropbox, Google Drive, etc.)

Zip file with project files must follow the same naming convention as PDF files.

Examples of inappropriate submissions:

- Incorrect format, no template: -20% of points (2pts)
- Incorrect file name: -10% of points (1pt)
- Unreadable content: -70% of points (7pts)
- Screenshots/Pictures without reasonable explanation/descriptions -30% of points (3pts)

Help

TA is available through emails and WebCampus to answer all questions regarding the labs and should be utilized often. In addition, Lab Directors are always available to answer any questions. We

usually check our emails at least once a day. Online resources (e.g., Google, Wikipedia, etc.) and fellow students are also useful sources of information and help. However, all report work, including Prelabs and Postlabs ***must*** be performed and turned in **individually**. Make sure you complete the lab experiments before submitting the Postlab reports. We do **NOT** allow **plagiarism**. Copied works will be counted as 0 pts for both submissions.

On rare occasions, it may be necessary to miss a lab class. With a valid excuse, a make-up session can be arranged.

To help facilitate your learning process, please provide written feedback in a timely manner to help us modify lab experiments as necessary.

Public Health Directives

- Face coverings are currently optional for all faculty and students in the classroom.

- Students must follow all active UNLV public health directives while enrolled in this class. UNLV public health directives are found at Health Requirements for Returning to Campus. Students who do not comply with these directives may be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the UNLV Student Conduct Code, including being administratively withdrawn from the course.