



CSE 250L

Circuits and Electronics Lab

Mark Distribution:

| Type | Assessment | Weight | # of Assessments to be Assigned | # of Assessments to be Graded |
|--------------|---------------------|--------|---------------------------------|-------------------------------|
| Lab (20%) | Attendance | 2% | 9 experiments | All |
| | Lab Performance | 4% | 9 experiments | All |
| | Lab Report | 4% | 2< | Best 2 |
| | Lab Test (Hardware) | 6% | 1 | Individual |
| | Lab Test (Software) | 4% | 1 | Individual |
| Total | | 100% | | |

Lab Experiments:

| No. | Experiment Name | Type | Week/Experiment No. | Related CO (if any) |
|-----|---|----------|-----------------------|---------------------|
| 1 | Introduction to Laboratory Instruments (Part 1) | Hardware | Week 2 / Experiment 0 | CO4 |
| 2 | Introduction to Series and Parallel Circuits. | Hardware | Week 2 / Experiment 1 | CO4 |
| 3 | Verification of KVL and KCL. | Hardware | Week 3 / Experiment 2 | CO4 |
| 4 | Verification of Superposition Principle. | Hardware | Week 3 / Experiment 3 | CO4 |
| 5 | Introduction to Laboratory Instruments (Part 2) | Hardware | Week 4 / Experiment 0 | CO4 |
| 6 | I-V Characteristics and Circuit Equivalence. | Hardware | Week 4 / Experiment 4 | CO4 |
| 7 | Study of I-V Characteristics, and Verification of Thevenin's and Maximum Power Theorem using Software (LTspice) Simulation. (Dependent sources, I-V characteristics, sweep parameters) | Software | Week 5 / Experiment 5 | CO6 |
| 8 | Verification of Thevenin's Theorem and Maximum Power Transfer Theorem. | Hardware | Week 6 / Experiment 6 | CO4 |

| Midterm Week | | | | |
|-------------------|--|----------|------------------------|-----|
| 9 | Open practice for Lab Test | Hardware | Week 8 / Practice | |
| Hardware Lab Test | | | | |
| 10 | Study of Transient Behaviour of RC Circuit. | Hardware | Week 10 / Experiment 7 | CO4 |
| 11 | Study of Transient Circuits Using Software Simulation. | Software | Week 11 / Experiment 8 | CO6 |
| 12 | Study of AC Circuits Using Software Simulation. | Software | Week 11 / Experiment 9 | CO6 |
| Software Lab Test | | | | |

Group Formation:

- There will be 6 or 8 groups (depending on the number of tables available) in each lab section. The groups will be formed before starting the first lab experiment. The formed groups will be maintained throughout the semester.
- The lab faculties hold the power to form/change/take any decision regarding the lab groups.

Attendance and Class Performance

- Class performance marks will be calculated by adding up class performance marks of best **(n-1)** from **n** lab days (10 marks each).
- A student's attendance will be counted as a "Late Attendance" if he/she comes 15 minutes after the scheduled lab time. Every "Late Attendance" will be considered as a "Half Attendance" and the class performance will also be counted as half for that day.
- If a student remains absent during an experiment due to a valid reason, he/she must perform that experiment with any other section (subject to approval from the lab faculty of that section). He/she must request for attending the missed experiment in another suitable section by a **google form** provided by the section faculty. Otherwise, he/she will not be awarded Attendance, and Lab Performance marks for that particular experiment under any circumstances.

Lab Report:

- **Lab reports are individual.**
- Lab reports are to be submitted only for hardware experiments.
- A student must submit both hard copy and softcopy of the lab reports. The **deadline** for the softcopy submission is the 11:59 PM of the day before the lab day of the immediate next week. Faculty will provide a Google form link for the report softcopy submission. In case if a lab experiment on a particular topic is conducted before the topic is covered in theory classes, the deadline for report submission will be adjusted accordingly by the lab faculty (*with the exception of Experiment 3*).
- One individual from each group will have to submit **at least 2 lab reports** on two hardware experiments. The submission will be in a rotatory manner.
- Each of the groups will have to submit at least one report for each hardware experiment.
- By the time all the experiments are completed, each student should have at least two lab reports submitted.
- The report must be prepared in the provided Lab sheet. Students must answer all the Questions and show necessary calculations. The Discussion and the Data Table section should also be completed properly. Extra pages can be used if necessary.

- N.B: The hard copy of the lab sheet will be provided by the faculty in the lab session (One for each group). The softcopy will be provided in Discord.

Lab Test:

- Hardware Lab Test
 - A hardware lab test will be held after performing all the hardware experiments (Experiments 1 - 4, 6 - 7).
 - The lab test will be **individual**.
 - Students may be asked to implement a circuit comprising series-parallel combinations of circuit components and measure voltage, current, power, etc. using a multimeter or/and plot waveforms using the oscilloscope. The understanding and interpretation skills of the students will be tested through a viva during the lab test.
- Software Lab Test
 - A simulation lab test will be held on two software experiments (Experiments 5, 8 - 9).
 - The lab test will be **individual**.
 - Students may be asked to build a circuit comprising series-parallel combinations of circuit components and perform
 1. dc analysis to measure branch voltage, branch current, node voltage, mesh currents, power, etc.
 2. dc sweep to plot I-V characteristics of any linear circuits.
 3. parametric sweep to observe voltage/current/power as a function of any circuit parameters.
 4. transient analysis to observe the transient characteristics of first order circuits
 5. transient analysis to plot ac voltages and currents as a function of time to measure ac parameters (voltage phasor, current phasor, phase difference etc).

* *All the policies are subject to change depending on the decision of the faculties.*

* *Any kind of plagiarism will result in severe punishment.*