EECE 310L – Electric Circuits Laboratory

Catalog description: A laboratory course that covers passive electronic components; laboratory instruments; voltage divider circuits; sources and Thevenin’s theorem; RC lead-lag networks; series resonance; op-amp circuits; single-phase rectifier circuits; LEDs; Zener diode regulator; diode clamping and clipping; BJT and MOSFET characteristics.

Credit hours: 1 credit

Required or elective: Required for CCE / ECE students

Prerequisites:
By course: EECE 310 (pre- or co-requisite).
By topic: Electric circuit analysis techniques; circuit components; electronic components.

Textbook(s) and/or required materials: Laboratory manual; additional material posted on Moodle.

References: None

Computer usage: Microsoft Office, Moodle

Course Objectives
1. Familiarize students with basic laboratory instruments used in circuits and electronics
2. Introduce laboratory techniques to implement and analyze electronic circuits
3. Familiarize students with various circuit and electronic devices and their applications

Course Topics
1. Introduction to Circuits and Electronics Lab
2. Equipment and Instruments in the Lab
3. Voltage Dividers and Thevenin’s Theorem
4. RC and RLC circuits
5. Diode Rectifier Circuits
6. LEDs and Zener Diodes
7. Diode Clipping and Clamping Circuits
8. OP-AMP Circuits
9. MOS Transistors
10. Bipolar Junction Transistors
Course Learning Outcomes

1. Understand and apply the general lab safety rules.
2. Have acquired the proper procedure of plugging and unplugging electrical equipment.
3. Learned the proper use of the multi-meter and its functions.
4. Learned the proper use of the power supply and its functions.
5. Learned the proper use of the function generator and its functions.
6. Learned the proper use of the oscilloscope and its functions.
7. Learned and practiced reading resistor color codes.
8. Learned and practiced reading inductor color codes.
9. Learned and practiced reading capacitor codes.
10. Learned how to properly identify and determine the correct polarity of junction diodes, LEDs, and Zener diodes.
11. Learned experimentally the difference between lead and lag networks.
12. Learned how to properly determine the phase shift between two signals using the oscilloscope.
13. Learned the different types of rectifier circuits along with their advantages and disadvantages.
14. Learned different types of diode circuits such as limiting and clamping.
15. Learned experimentally different op-amp circuit configurations and verified the theoretical calculations.
16. Learned experimentally about the BJT and its different applications (amplifier, current source, and switch).
17. Learned experimentally about the MOSFET and its different applications (amplifier, current source, and switch).

Class/laboratory schedule: One 180-minute laboratory session per week.

Evaluation methods

1. Participation/Evaluation  2%
2. Quizzes  30%
3. In-lab reports  16%
4. Lab reports  12%
5. Final Exam  40%

Professional component

Engineering topics  100%
General education  0%
Mathematics and basic sciences  0%

Person(s) who prepared this description and date of preparation
M. Khaled Joujou, Ayman Kayssi, and Sara Khaddaj, September 2007

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