

PHYSICS 404

Electronics Lab

T 2:00-5:00PM/R 2:00-3:50PM, IESB 304

Dr. Rakitha S. Beminiwattha
rakithab@latech.edu
Office EA-210
Office Hours: MTWRF 8:30-10:30 am
(318) 257-2435

The Art of Basic Electronics

Course Description: A study of the electric and electronic circuits. The course includes a lecture and a lab per week that will teach laws, rules of thumbs, and tricks of the art of basic electronics. The goals of the course are listed below

1. Electric circuits: The concepts of electricity and components that make up electric circuits.
2. Passive linear circuits: The introduction to passive linear elements (resistors, capacitors, and inductors) and basic examples of passive linear circuits (AC filters, blocking and bypass applications)
3. Active circuits: The introduction to basic active electronic elements (diodes, transistors, operational amplifiers) and basic electronics circuits consisting diodes, transistors and operational amplifiers.

Please see the tentative schedule of the class at the end of the this document.

Prerequisite(s): none

Credit Hours: 2

Suggested Text: *The Art of Electronics*, 2nd Edition or higher

Authors: Horowitz and Hill;

Recommended software: CIRCUITLAB

Link: <https://www.circuitlab.com/workbench/>

Grading Policy:

- Peer discussions (in class and outside) and attendance - 20%
- Lab reports - 80%
 - There will be 8 in class lab activities.
 - Lab report is due week from the date of the lab.
 - Must attend to the lab to submit a lab report.
 - Failure to return the lab report before due date will be penalized. You will loose –10% for each late lab report. Failure to return the lab report within 1 week of past the due date will loose –20%. No 2 weeks or more late lab reports will be graded

- See rubric for lab grading policy

Grading Scale: A : ≥ 88 , B : 75 - 87, C: 60 - 74, D: 50 - 59, F ≤ 49

Academic Honor Code Summary: In accordance with the Academic Honor Code as stated in the university catalog, student must pledge to embody the principles of academic integrity. The honor code can be found starting on page 116 of the Student Handbook at <https://www.latech.edu/documents/2018/09/student-handbook.pdf/>

Attendance: Attendance will be recorded for all the classes. For every class or lab missed, you are required to provide a valid excuse to do a makeup lab. your contribution to final grade from attendance will be reduced proportional to missed classes. Contact me if you have questions regarding attendance policy.

Peer Discussions: I will provide informal exercises to be solved in class and as homework to encourage peer discussions. Students are expected to include a discussion about these exercises in their lab reports.

Students with Disabilities: Students needing testing or classroom accommodations based on a disability are encouraged to discuss these needs as soon as possible. The accommodations memo is available at the Office of Disability Services (<http://www.latech.edu/ods>)

Emergency Notification System: Students are encouraged to enroll and update their contact information in the Emergency Notification System. This will ensure that you will receive important texts and voice alerts in an event of a campus emergency. Please visit <http://www.latech.edu/administration/ens.php>

Course Outline: The proposed coverage might change with the progress of the class. Therefore what is given below is a tentative course outline.

Tentative Schedule

Week/Date	Unit
Week1/Dec 5	Introduction (circuit review)
Week2/Dec 10	Signal generator impedance
Week3/Dec 17	RC/RL Circuit - transient response
Week4/Jan 7	RC Circuit - RC circuits and complex impedance
Week5/Jan 14	RLC Circuit - transient analysis
Week6/Jan 21	Diodes and AC-to-DC Conversion
Week7/Jan 28	Bipolar Junction Transistors - Introduction
Week8/Feb 4	Bipolar Junction Transistors - Emitter Followers and Inverting Amplifier
Week9/Feb 11	Operational Amplifiers
Week10/Feb 18	Operational Amplifiers with reactive elements
Week11/Feb 27	Reserve