

PHYSICS 404

Electronics Lab

T 1:00-5:00PM/R 1:00-2:15PM, Bogard Hall 316

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Office Hours: MTWRF 9:00-11:00 am
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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: **QUCS: Quite Universal Circuit Simulator**

Link: <http://qucs.sourceforge.net/index.html>

Grading Policy:

- Peer discussions (in class and outside) and attendance - 20%
- Lab reports - 80%
 - There will be 10 in class lab activities and I will drop the least grade lab report.
 - Lab report is due week from the date of the lab.
 - Failure to return the lab report before due date will be penalized by deducting points from attendance. You will loose 1 point (out of 100) for each missed lab report.
 - Failure to return the lab report within 1 week of the due date will loose 5 points each.

– See tentative schedule of activities. This is subjected to change as the course proceeds.

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: Being a student of higher standard, I pledge to embody the principles of academic integrity.

Please visit <http://www.latech.edu/documents/honor-code.pdf> for more information

Attendance: Attendance will be recorded for all the classes. For every class or lab missed, you are required to provide a valid excuse. your contribution to final grade from peer discussions and 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 with the instructor as soon as possible. An 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/Nov 29	Introduction (circuit review)
Week2/Dec 7	Signal generator impedance
Week3/Dec 14	RC/RL Circuit - transient response
Week4/Jan 4	RC Circuit - RC circuits and complex impedance
Week5/Jan 11	RLC Circuit - transient analysis
Week6/Jan 18	RLC Circuit - steady state and resonance
Week7/Jan 25	AC-to-DC Conversion - diodes and building a power supply
Week8/Feb 1	Bipolar Junction Transistors - Emitter Followers and Inverting Amplifier
Week9/Feb 8	Operational Amplifiers
Week10/Feb 15	Operational Amplifiers with reactive elements
Week11/Feb 22	Reserve