

# ECE 345 L

## ELECTRONIC INSTRUMENTATION AND SYSTEMS LAB

FALL 2009

---

Week of	Topic
Aug. 31	No labs meet this week
Sept. 7	No labs meet this week
Sept. 14	Lab Safety and Lab I Lecture ( 1 - hour )
Sept. 21	Lab II Lecture ( 20 - min ) Perform Lab I: Introduction to the Oscilloscope, Function Generator and Digital Multimeter
Sept. 28	Lab III Lecture ( 20 - min ) Lab II: Introduction to Prototyping Circuits
Oct. 5	Lab IV Lecture ( 20 - min ) Lab III: Diode Curve Tracer
Oct. 12	Lab V Lecture ( 20 - min ) Lab IV: Introduction to Microcontrollers
Oct. 19	Lab VI Lecture ( 20 - min ) Lab V: Build Your Own Digital DC Voltmeter
Oct. 26	Lab VII Lecture ( 20 - min ) Lab VI: Serial Liquid Crystal Display
Nov. 2	Lab VIII Lecture ( 20 - min ) Lab VII: Power Amplifier for a Portable CD Player
Nov. 9	Lab IX Lecture ( 20 - min ) Lab VIII: DC Power Supply and Regulator
Nov. 16	Lab IX: Light Activated Exhaust Fan
Nov. 23	No labs meet this week
Nov. 30	Pick up graded Lab IX and do TA evaluations
Dec. 7	No labs meet this week

**A Lab Exam on Labs I - IX will be given on Monday Dec. 7th in the ECE 345 lecture class. You should bring a non-programmable calculator, pencil and ruler. You will not be allowed to use a programmable calculator or share calculators.**

# ECE 345 L

## ELECTRONIC INSTRUMENTATION AND SYSTEMS LAB

**MATERIALS:** Rizzoni, *Principles and Applications of Electrical Engineering*, McGraw-Hill, 5th Edition or later (on reserve in the Engr. Library)

G.M. Wierzba, *ECE 345 Course e-Notes and Lab Manual, Fall 2009 Edition*, available at <http://stores.lulu.com/willowepublishing>

Safety Glasses

**GRADING:** LAB REPORTS\* 60%  
(1/3) EXAM (M 12/7 @ 9:10 - 10 am; Agriculture Hall Rm 008) 40%

\* Your lab report grade consists of 60 points maximum. Your total lab report grade is multiplied by a scale factor at the end of the course such that all sections have the same average lab report grade.

*You must pass the lab to pass the course.*

**OVERVIEW:** Your lab instructor will give the lectures needed for this course. Your lab instructor will also give a weekly quiz on the lab you are about to perform including the lab lecture material from the previous week. This will count for 10 points of the maximum 60 points.

This lab is intended to teach measurement techniques as well as reinforcing concepts taught in ECE 345. As you complete each task in lab you will be asked to record, calculate and evaluate your data. You cannot go on to the next step or circuit unless each task is completed as stated in the lab experiment. This method emphasizes accuracy over speed. Your lab report is due at the **end of the period**. Your lab instructor will return your graded lab at the beginning of the next lab period. If you come to lab unprepared you will probably be unable to finish all of the tasks in each lab. You must read the lab thoroughly before you come to lab and review past labs for measurement procedures.

**POLICIES:** Any copying of lab data from another group or section will result in a failing grade.

If you miss more than two labs you will receive a failing grade. There are no make up labs. Your grade will be computed by dropping your lowest Lab Report grade.

Since everyone in lab is trying to complete their lab report during lab you are not allowed to ask other lab groups for help. The lab instructor will try to help you but you are responsible for your own work.

**TARDINESS:** Lab needs to start on time. Your lab instructor will take attendance at the start of lab. Your lab report grade will be multiplied by 0.9 if you are tardy from 1 to 10 min., by 0.85 if you are tardy from 11 to 30 min. *If you are late more than 30 min you will not be allow to enter lab.*

# Electrical Safety Considerations for ECE 345 L

Safety glasses are required. Minimally prescription glasses are ok but full wrap around glasses are preferred. If you fail to wear safety glasses or come to lab without a pair of safety glasses, you will be asked to leave. You can purchase another pair at the bookstore and return to lab but the penalty for tardiness described on the previous page will apply.

The equipment used in ECE 345 Lab is primarily low voltage. There is no danger associated with this equipment when used as instructed. Care should always be taken not to touch the prongs of an electrical plug when inserting or removing it from an electrical outlet.

In some lab experiments we are going to use polarized electrolytic capacitors. These elements must at all times have a positive voltage across their terminals with respect to an indicated polarity. Failure to do so can result in the component overheating which could cause severe burns. In such experiments warning boxes are placed in the experimental procedure and your project consultant will be required to check your wiring before you proceed.

We will also be cutting and stripping wires in most labs. This sometimes causes pieces of wire or plastic to fly through the air. This and the danger from capacitors is why we need safety glasses at all times.