EEE4304L - Electronics II Lab

Three Credits, Four and a half hours, Engineering Topic.

Instructor: Pulak Bhushan.

Textbook: Adel S. Sedra, Kenneth Carless Smith Oxford University Press, USA,2014-11-06 ISBN-10: 0199339139 ISBN-13: 9780199339136

Specific Course Information:

This is an undergraduate-level course which covers the design and measurement in experiments of advanced electronics, including applications of integrated circuits. The course presents an insider's perspective on how advanced electronic circuits are designed, built and tested to understand the functionality of each individual circuits.

Since the course is intended to serve students with a background in Electrical Engineering, fundamental knowledge of electrical and electronic circuits, circuit simulation tool experience and building basic electrical circuits skills are expected. These include fundamental principles and primarily level circuit applications of D.C. and A.C. circuits, RLC circuits, Op-Amp, diodes, and BJTs etc. Topics covered in this course include advanced circuit applications of basic electronic devices such as bipolar junction transistors (BJTs), Op-Amps, MOSFET etc.

This course will consist of 10 modules with 7 experiment lab activities and 1 final design project. Module availability is open. Every lab activity under different modules will be completed in a group. The deadlines of such reports are marked in the class schedule at the end of this document. Communication will take place primarily via Canvas Inbox and professor announcements. At the end of the course, you would have learned the key techniques required to design, build and test different advanced electronic circuits.

Specific Goals for the Course

a. Specific outcomes of instruction

Upon successful completion of this course, the student will:

1.Design, develop and analyze advanced electronic circuits.

2.Test and examine different electronic circuits by using electrical test and measurement instruments including multimeters, oscilloscopes, power supplies, and function generators equipped in My DAQ.

3.Compare theoretical, simulated and experimental data when designing advanced electronic circuits.

4.Interpret and summarize experimental findings with tables, graphs or other means.

5.Use the techniques, skills, and modern engineering tools to design advanced electronic circuits.

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.

In this course the student will have to show

(a) an ability to apply knowledge of mathematics, science, and engineering (X)

(b) an ability to design and conduct experiments (simulations), as well as to analyze, interpret data (X)

(c) an ability to design a system, component, or process to meet desired needs (X)

(d) an ability to function in multi-disciplinary teams (N/A)
(e) an ability to identify, formulate, and solve engineering problems (homework) (X)
(f) an understanding of professional and ethical responsibility (N/A)
(g) an ability to communicate effectively (through project reports) (X)
(h) the broad education necessary to understand the impact of engineering solutions in a global and societal context (N/A)
(i) a recognition of the need, and an ability to engage in life-long learning (N/A)
(j) a knowledge of contemporary issues (N/A)
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (X)
(l) a knowledge of probability and statistics (N/A)

Brief list of the topics to be covered

1.scillators
2.Feedback
3.Power Amplifiers
4.DC-DC Converters
5.Thyristors

GRADING:

Course Requirements	Weight
Experiment video assignments	28%
First group report	14%
Second group report	14%
Third group report	14%
Final design project proposal	4%
Final design project presentation	11%
Final design project report	15%
Overall Grade:	100%

Conversion of Numerical Grade to Letter Grade

92<=A<=100	75<=B<80	60<=C<65
85<=A-<90	70<=B-<75	50<=D<60
80<=B+<85	65<=C+<70	F: Below 60