The University of Texas at Tyler
Department of Electrical Engineering

Course: EENG 3106 – Electronic Circuit Analysis I Lab
(Required for students entering the electrical engineering program in or after fall, 2002)

Syllabus

Catalog Description:

Circuit applications of operational amplifiers; circuit effects of non-ideal characteristics of operational amplifiers; diode characteristics; diode circuits and applications; transistor biasing (bipolar junction transistors and field effect transistors); low frequency transistor amplifier design.

Prerequisites: EENG 3306 (Co-requisite)

Credits: (0 hours lecture, 1 hour laboratory per week)

Text(s): None

Additional Material: Laboratory procedures (provided on-line)

Course Coordinator: David M. Beams, Associate Professor

Topics Covered: (paragraph of topics separated by semicolons)

Generalized amplifier models and two-port networks; operational amplifier circuits (including non-ideal characteristics); semiconductor diode characteristics; diode rectifier and waveshaping circuits; MOSFET device characteristics; bipolar junction transistor characteristics; the common-emitter amplifier.

Evaluation Methods: (only items in dark print apply):

1. Examinations / Quizzes
2. Homework
3. Report/paper
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Learning Objectives: By the end of this course students will be able to:

1. Calculate and measure the effects on circuit performance of non-ideal electrical characteristics of operational amplifiers.
2. Measure and analyze semiconductor diode V-I characteristics.
3. Design simple rectifier and waveshaping circuits.
4. Measure and analyze the V-I characteristics of enhancement-mode MOS devices.
5. Measure and analyze the V-I characteristics of bipolar junction transistors.
6. Measure the voltage gain, input impedance, and output impedance of a single-stage amplifier and compare these to theoretical values.
7. Use modern engineering tools including modeling and simulation software and virtual instruments.
8. Utilize engineering literature such as technical manuals and product datasheets to

select components to meet experimental or prototype requirements
9. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.

Relationship to Program Outcomes (only items in dark print apply)[1]: This course supports the following Electrical Engineering Program Outcomes, which state that our students will:

1. have the ability to apply knowledge of the fundamentals of mathematics, science, and engineering;
2. have the ability to use modern engineering tools and techniques in the practice of electrical engineering [7];
3. have the ability to analyze electrical circuits, devices, and systems [1,6];
4. have the ability to design electrical circuits, devices, and systems to meet application requirements [3];
5. have the ability to design and conduct experiments, and analyze and interpret experimental results [2,4,5];
6. have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods;
7. have effective written, visual, and oral communication skills [9];
8. possess an educational background to understand the global context in which engineering is practiced, including:
   a. knowledge of contemporary issues related to science and engineering;
   b. the impact of engineering on society;
   c. the role of ethics in the practice of engineering;
9. have the ability to contribute effectively as members of multi-disciplinary engineering teams;
10. have a recognition of the need for and ability to pursue continued learning throughout their professional careers [8].

[1] Numbers in brackets [ ] indicate the Course Learning Objectives which support individual Program Outcomes.

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:	0	hours
Engineering Sciences and Design:	1	hours
General Education Component:	0	hours

Prepared By:	David M. Beams R. J. Pieper	Date:	8 August 2016 20 August 2018