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

Syllabus

Catalog Description:
Semiconductor devices; diode characteristics; diode circuits and applications: wave shaping and rectifier circuits; transistor biasing (bipolar junction transistors and field effect transistors); low frequency transistor amplifier design; multi-stage amplifier design.

Prerequisites: EENG 3306 (Co-requisite)

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

Text(s): None

Additional Material: Laboratory procedure handouts (provided on-line), bound laboratory notebook

Course Coordinator: David M. Beams, Associate Professor

Topics Covered: 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. Laboratory reports
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course 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.
Relationship to Program Outcomes (only items in dark print apply)*: 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);
2. have the ability to use modern engineering tools and techniques in the practice of electrical engineering (3);
3. have the ability to analyze electrical circuits, devices, and systems (2);
4. have the ability to design electrical circuits, devices, and systems to meet application requirements;
5. have the ability to design and conduct experiments, and analyze and interpret experimental results (3);
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 (1);
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.

*Numbers in **BOLD** indicate the degree to which this course supports these program outcomes. 0 = outcome is not a focus of this course; 1 = outcome is a minor focus of this course; 2 = outcome is a significant focus of this course; 3 = outcome is a major focus of this course.

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

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