

The University of Texas at Tyler
Department of Electrical and Computer Engineering

EENG 3106.001L: Electronic Circuit Analysis I Lab (required)

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, 3 hours laboratory per week)

Text(s):

None

Additional Material:

Laboratory Procedures (provided online)

Course Coordinator:

Md Masud Rana, PhD, Assistant 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 Outcomes¹: 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 wave shaping 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 common-emitter 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.

¹Numbers in brackets refer to method(s) used to evaluate the course learning outcome.

Relationship to Student Outcomes (only items in dark print apply)²: This course supports the following Electrical Engineering Student Outcomes, which state that our students will possess:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics [1,6].
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors [3].
3. An ability to communicate effectively with a range of audiences. [9]
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions [2,4,5,7].
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies. [8].

²Numbers in brackets refer to course learning outcome(s) that address the Program Outcome.

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	3	hours
General Education Component:		hours

Grade Replacement:

If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12th day of class. Failure to file an intent to use grade forgiveness will result in both the original and repeated grade being used to calculate your overall grade point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) or two (graduate student) course repeats during his/her career at UT Tyler. (2006-08 Catalog, p. 35)

Prepared By:

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Date:

8 August 2016
20 August 2018
10 August 2019
22 August 2024
17 August 2025