The University of Texas at Tyler
Department of Electrical Engineering

Course: EENG 4309 – Electronic Circuit Analysis II (Required)

Syllabus

Catalog Description:

Operational amplifiers; frequency response of passive and active networks; feedback concepts and oscillators; small-signal analysis; load-line analysis; introduction to nonlinear electronic circuits; digital circuits.

Prerequisites: EENG 3306, EENG 3106, EENG 3305, EENG 3302

Credits: (3 hours lecture, 0 hours laboratory per week)

Text(s): Sedra, A. S., and Smith, K.C. *Microelectronic circuits, 5th Ed.* Oxford University Press, 2004. ISBN 0–19–514251–9

Additional Material: Engineering paper, scientific calculator; access to PSpice, MATLAB, and Excel

Course Coordinator: David M. Beams

Topics Covered: (paragraph of topics separated by semicolons)

Single- and multi-stage amplifiers for IC implementation; differential amplifiers and operational amplifiers; data-conversion circuits (A/D and D/A converters); feedback concepts; criteria for oscillation in feedback circuits; oscillator circuits; active and passive filters; introduction to large-signal amplifiers and nonlinear electronic circuits.

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

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

[1] *Problem of the Week submissions are considered to constitute homework.*

Course Objectives[2]: By the end of this course students will be able to:

1. Analyze single- and multi-stage amplifiers [1,2];
2. Analyze differential amplifiers and the circuit of a simple operational amplifier[1,2]
3. Analyze systems involving feedback and determine their frequency response [1,2]
4. Derive the transfer characteristics of a CMOS inverter [1,2] and design simple CMOS logic gates to implement specified Boolean algebra operations [1,2]
5. Determine the conditions under which circuits with feedback will oscillate [1,2]
6. Analyze and design simple active filters [1,2]
7. Analyze simple large-signal amplifiers and simple nonlinear circuits [1,2]

[2] *Numbers in brackets refer to method(s) used to evaluate the course objective.*

Relationship to Program Outcomes (only items in dark print apply)[3]: 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 [1-7]; **(2)**
2. have the ability to use modern engineering tools and techniques in the practice of electrical engineering [1,3-7]; **(3)**
3. have the ability to analyze electrical circuits, devices, and systems [1-7]; **(3)**
4. have the ability to design electrical circuits, devices, and systems to meet application requirements [1-7]; **(3)**
5. have the ability to design and conduct experiments, and analyze and interpret experimental results;
6. have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods [1,3-6]; **(2)**
7. have effective written, visual, and oral communication skills;
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.

[3] *Numbers in brackets refer to course objective(s) that address the Program Outcome.* ***Bold*** *numbers in parentheses indicate the degree to which the outcome is a focus of this course.*

0=no focus;
1=minor focus;
2=significant focus;
3=major focus.

Prepared By: David M. Beams Date: 18 January 2011