

The University of Texas at Tyler
Department of Electrical Engineering

EENG 4109.031 – Electronic Circuit Analysis II Laboratory (Required)

Syllabus

Catalog Description:

Structure of a simple operational amplifier; active filters; feedback concepts and oscillators; small-signal analysis; introduction to nonlinear electronic circuits; transfer characteristics of CMOS digital circuits; introductory LabVIEW programming.

Prerequisites: EENG 4309 (co-requisite)

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

Text(s): None

Additional Material: None

Course Coordinator: Ali Ghorshi, PhD

Topics Covered: (paragraph of topics separated by semicolons)

Measurement of amplifier gain and input and output resistances; pole-zero locations and frequency response; construction and test of a simple operational amplifier; active filter design and test; transfer characteristics of a CMOS inverter;

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

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

Course Learning Objectives¹: By the end of this course students will be able to:

1. Measure the mid-band characteristics (input resistance, output resistance, and voltage gain) of a single-stage amplifier and compare them to expected values [3].
2. Compute the frequency response of a linear network from its pole/zero locations and compare those to empirical measurement [3].
3. Simulate the effects of negative feedback (extended bandwidth, effects on input and output impedances, stabilization of closed-loop gain, improved disturbance rejection) [3].
4. Measure the electrical characteristics (input-bias current, input-offset voltage, slew rate, output voltage range, and gain-bandwidth product) of a simple operational amplifier [3].
5. Design simple active filters [3].
6. Validate the performance of simple active filters [3]
7. Analyze feedback circuits and determine when a feedback circuit will oscillate [3].

8. Measure the transfer characteristics of an MOS inverter [3].
9. Use modern engineering tools including modeling and simulation software and virtual instruments [4]
10. Perform experiments as members of a team [3,4]
11. Utilize engineering literature such as technical manuals and product datasheets to select components to meet experimental or prototype requirements [3]
12. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner [3]

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

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 [2,7]
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 [3,5]
3. an ability to communicate effectively with a range of audiences [12]
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 [10]
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions [1,4,6,8,9]
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies. [11]

²Numbers in brackets refer to Course Learning Objective(s) that address the Program Outcome.

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:	0	hours
Engineering Sciences and Design:	3.0	hours
General Education Component:	0	hours

Prepared By: Revised by Kazi Rashed

Edited By: Ali Ghorshi

Date: 08 January 2020

26 December 2020

**The University of Texas at Tyler
Department of Electrical Engineering**

EENG 4109.031

Electronic Circuit Analysis II Laboratory

Course Outline

Spring 2021

Time: Monday 2:00 PM-4:45 PM

Place: B208 and B214

Instructor: Ali Ghorshi, PhD

Email: aghorshi@uttyler.edu

Office: A215

Zoom ID: 927 4038 9894

Passcode: 610652

Schedule:

Week	Laboratory Procedure
1	No laboratory
2	CC and CB Amplifiers
3	CC and CB Amplifiers
4	Frequency Response
5	Frequency Response
6	Negative Feedback
7	Negative Feedback
8	Midterm Exam
9	The Differential Amplifier
10	The Differential Amplifier
11	Active Filters
12	Active Filters
13	Oscillators
14	Oscillators
15	Final exam

Assessment:

Prelab Report	10%
Final Lab Report	40%
Midterm Exam	20%
Final Exam	30%

Grading Scale:

Grades will be assigned based on the total score as per the distribution below and the following scale out of a 100 total:

A:	89% – 100%
B:	77% – 88%
C:	65% – 76%
D:	53% – 64%
F:	< 53%

Any deviation from the above policy such as scaling or curving to calculate the individual item or final scores will be at the sole discretion of the instructor and performed by the instructor uniformly for all students in the class.

Attendance and Make-up Policy:

The progressive nature of the class means that perfect attendance is recommended if a good grade is desired. Makeup quizzes, exams or projects will only be provided for valid absences and at the sole discretion of the instructor.

Paperless submission:

All submissions in this course are to be submitted to UT-Tyler's Learning Management System (Canvas).

Simulation prior to laboratory:

Two weeks are allocated for each laboratory exercise. Simulation is expected to be completed by the end of the first laboratory session. Attendance at the first laboratory session is optional; you may, however, come to the laboratory to begin the laboratory work if you wish.

Final laboratory results:

Final results of a laboratory procedure are due by 11:95PM one week following the end of the procedure.

Course communication:

Course communication will take place by e-mail and by announcements on UT-Tyler's Learning Management System (LMS). University policy requires that official e-mail communication be sent only to Patriot e-mail accounts.

Academic misconduct:

Academic misconduct that comes to light will be dealt through the formal discipline process. Examples of academic misconduct include (but are not limited to) submitting the work of others as one's own, copying from others during quizzes, and doing work intended to be submitted by another person.

General Policies of the University of Texas at Tyler

Grade Replacement/Forgiveness and Census Date Policies: Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions that students need to be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy: Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability Services: In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact the Disability Services office in UC 3150, or call (903) 566-7079.