



University of Maryland Eastern Shore
Department of Engineering
Course Syllabus

Course Title: ENGE 241, Analog Circuit Lab
Section 0101, 1 credit

Course Description:

Introduction to basic measurement techniques and electrical laboratory equipment, power supplies, oscilloscopes, multimeters, and function generators; experiments concerning principles taught in ENGE 240 Basic Circuit Theory course.

Place and Time: Friday, 4:00 PM – 6:50 PM, EASC Building, Room 2041/3069

Instructor: Dr. Liang Zhang
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Phone: 410-651-6478
Office: Room 3007, EASC building

Office Hours: Monday 11:00 AM – 12:00 PM, Tuesday 1 PM – 3 PM

Prerequisite/Co-requisite: MATH 211/ENGE 240

Textbook: Lab manuals, datasheets, and equipment instructions will be provided in class and posted online.

Course Objectives:

1. Introduction to basic measurement techniques and electrical laboratory equipment (power supplies, oscilloscopes, multimeters, etc.). Experiments concerning principles taught in ENGE 240. The laboratory will cover basic resistive circuits, Ohm's law, Kirchhoff's law, voltage and current division law, and Thevenin's equivalent circuit and Norton's equivalent circuit.
2. Use basic test and measurement equipment necessary to evaluate the performance of simple circuits.
3. Understand basic limitations, inaccuracies, and tolerances of the test equipment and components.
4. Understand procedures. Design circuits with efficient reliability and effectively achieve the desired results.
5. Use good techniques for drawing circuits and wiring diagrams.
6. Wire and troubleshoot circuits on the breadboard.
7. Simulate, analyze, and evaluate designed circuits with professional software. Teamwork in the lab to maximize the results.
8. Write Technical reports for laboratory experiments.
9. Apply systems thinking in whole-system circuit design – Understand how individual circuit components (e.g., resistors, capacitors, transistors, op-amps) interact as part of a larger system. Practice analyzing trade-offs, optimizing for performance, and ensuring that the circuit functions reliably under real-world constraints.

10. Strengthen teamwork and collaboration skills – Work effectively in lab groups to design, build, and troubleshoot circuits. Develop clear communication, task-sharing, and problem-solving strategies to ensure successful project outcomes, while gaining experience in collaborative engineering.

Lab and Lab Participation:

- Each lab has four major components: 1) the Prelab, 2) an in-class quiz, 3) the simulation/implementation work done in the lab, and 4) the lab report.
- All students are expected to attend all labs. Lab attendance is regarded as an obligation as well as a privilege, and all students shall attend regularly and punctually all labs in which they are enrolled. Excessive unexcused absences for any reason will result in either a low grade or course failure. If you cannot attend the lab, a courtesy call or an email to the professor before the lab time is required and appropriate.
- **Each absence without a proper reason and communication in advance to the instructor will result in a 10% reduction in the final grade, and no make-up will be provided. Three absences will automatically lead to an 'F' final grade.**
- If you missed a lab for a proper reason, contact the instructor for approval to schedule a make-up.
- Eating, drinking, or chewing gum is not permitted in the classroom.
- Your cell phone has to be turned off and kept in your handbag or pocket while you are in the lab.
- If you cannot attend class, a courtesy email to the professor before the class is required and appropriate.

Assignments:

- There are two types of assignments for each lab: Prelab and Postlab (lab report).
- The Prelab will be provided in class one week in advance. **The Prelab is due on the lab day. Only those who have finished the Prelab are allowed to do the lab experiment.** Others should not enter the lab room until the Prelab is finished. No late submissions will be accepted ('0' grade).
- The postlab is due on the following lab day. **All past-due submissions will get a '0' grade. All the posts must be submitted via Canvas electronically.** Only '.doc' and '.pdf' formats will be accepted. You **are required to** use the lab report template posted on Canvas in preparing the Postlab.
- All assignments are individually pledged. Nobody shall share the same writing as a group or across groups. If any Prelabs, quizzes, and lab reports are identified as plagiarized, all involved students will get a '0' for the lab.
- All materials submitted for evaluation (i.e., homework, quizzes, etc.) must have the following identifications: a) student's name and ID number, and b) date of submission.

Quizzes/Exams:

- A quiz with 10 - 20 minutes will be given in every lab.
- The final exam/test will be held in the lab (classroom).
- No make-up exams will be given, and the grade for a missed exam will be zero unless the student has a legitimate excuse documented properly (e.g., a letter from a court clerk that he/she must appear in a court, a letter from a physician that he/she is sick). The student must make an appropriate arrangement with the instructor for an excused missed exam.

Grading Policy:

- A grade of "I" will not be given to students who have a failing grade going into the finals.

- Grades will be based on lab participation/completeness, Prelabs, quizzes, lab reports, and the final exam.
- Extra credit may be given for special projects.

Tentative Point Allocation:

Attendance	5%
Prelab	10%
Quizzes	20%
Lab Reports	40%
<u>Circuit Test/Project</u>	<u>25%</u>
Total	100%

Tentative Grading Scale:

Average Range	Grade
90-100	A
80-89	B
70-79	C
60-69	D
Below 60	F

Course Content:

	Experiments	Topic	Assignment	Course Objectives
Week 1				
Week 2	0	Safety lecture and lab equipment tutorial	Pre-lab 1	
Week 3	1	Lab equipment	Pre-lab 2	1, 2, and 3
Week 4	2	DC circuits, resistors, and resistive sensors	Pre-lab 3	1 and 2
Week 5	3	Series and Parallel Circuits	Pre-lab 4	1 and 2
Week 6	4	Kirchhoff Law	Pre-lab 5	1 and 2
Week 7	5	Superposition theorem	Pre-lab 6	1 and 2
Week 8				
Week 9	6	Thevenin theorem	Pre-lab 7	1, 2, 3, and 4
Week 10	7	Norton theorem	Pre-lab 8	1, 2, 3, and 4
Week 11	8	Maximum power transfer	Pre-lab 9	1, 2, and 3
Week 12	9	Circuit Simulation with Multisim	Pre-lab 10	1, 2, and 3
Week 13	10	RC circuit transients	Pre-lab 11	1, 2, and 3
Week 14	11	Op-Amp Characteristics and Applications		1 and 2
Week 15		Circuit test		
Week 16		Circuit test		

* Lab contents may change upon notice in advance.

COURSE ASSESSMENT:

Engineering Accreditation Commission (EAC) of the Accreditation Board of Engineering and Technology (ABET) requires that engineering programs demonstrate that their graduates have the following outcomes or competencies:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
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. an ability to communicate effectively with a range of audiences.
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.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The course is assessed using formative and summative assessments in the form of prelabs, lab reports, quizzes, and final test/exam.

Course Assessment Methods	Extent of Coverage of Program Outcomes	Applicable ABET Program Criteria 3 Outcomes
Labs, prelabs, quizzes, Class discussions	Significant	1,3,5,6,7
Class discussion, final test/project	To some extent	1,3,6

Instructions for Student Athletes:

Any student-athlete enrolled in class must make an appointment within the first week of the semester to meet with the instructor so that game schedules and travel schedules can be discussed and the instructor can clarify the athlete's procedures and policy on make-up work. Student-athletes are reminded that absences (whether excused or unexcused) do not relieve them of their responsibility to complete course assignments. Instructors must know in advance that absences related to athletic events will occur so that early planning can take place. (See attached policy on class attendance)."

Dress Code:

Students are expected to exercise good judgment concerning appropriate dress for the classroom. Dressing appropriately in an environment that is conducive to learning requires that clothing not be distracting and is sufficient in quality and quantity to cover and protect the body (particularly in laboratories). Individual freedom of dress is upheld at UMES, but students should be respectful of the sensitivities of others and recognize that dressing professionally is a part of the training the university desires to provide. Attire that

is more appropriate for the bedroom or nightclubs should not be worn in the classrooms, as such may be distracting or offensive to others.

Student Professional Code of Conduct:

This Student Code of Conduct was created to support a productive and stimulating learning environment in all School of Business and Technology classes. The code is designed to help ensure a positive atmosphere for the vast majority of students who currently exhibit the professional standards detailed below.

- Students should exhibit professional classroom values and behavior by:
 - Engaging in appropriate communication and interaction.
 - Demonstrating trust, respect, and civility.
 - Approaching course content as important and necessary for business success.
 - Engaging in responsible classroom activities such as:
 - ✦ turning off cell phone ringers
 - ✦ avoiding unnecessary talking
 - ✦ not reading outside material or doing other work during class
- Students should contribute to a positive learning environment by arriving, attending, and departing class in a professional manner.
 - Taking responsibility for team and individual assignments.
 - Developing cooperative relationships with other students and faculty.
- Students should support a professional environment within the School of Business and Technology by:
 - Avoiding inappropriate language in and near classrooms and offices.
 - Refraining from unrealistic expectations in dealing with administration, faculty, and staff.
- Students must uphold the academic integrity standards. Academic integrity is conceptualized as doing and taking credit for one's own work. Violations of the university's academic integrity standards include, but are not limited to:
 - Cheating in the classroom. Cheating includes using unauthorized sources of information and providing or receiving unauthorized assistance on any form of academic work.
 - Examples of cheating include giving answers to others in a testing situation without permission of the instructor; taking or receiving answers from others in a test situation without permission of the instructor; having possession of test materials without permission; taking, giving, or receiving test materials prior to tests without permission; having someone else take a test or perform an assignment for you; submitting as your own work, work done by someone else; permitting someone else to submit your work under that person's name; falsifying research data or other research material; copying with or without permission any work, e.g., essays, short stories, poems, etc., from a computer, hard drive or discs and presenting them as your own.
 - Plagiarism. Plagiarism includes the copying of language, structure, ideas, or thoughts of another and representing them as one's own without proper acknowledgment. ○ Examples of plagiarism include taking ideas from a source without clearly giving proper reference in a way that identifies the original source of the ideas and distinguishes them from your own; indirectly quoting or paraphrasing material taken from a source without clearly giving proper reference in a way that identifies the original source and distinguishes the paraphrased material from your own compositions; directly quoting or exactly copying material from a source without giving proper reference or otherwise presenting the copied material as your own creation.

- Unauthorized Possession or Disposition of Academic Materials. Unauthorized possession or disposition of academic materials includes the unauthorized selling or purchasing of examinations or other academic work; stealing another student's work; unauthorized entry to or use of material in a computer file; theft or mutilation of library materials; and using information from or possessing exams that an instructor did not authorize for release to students.
- Falsification. Falsification encompasses any untruth, either verbal or written, in one's academic work.
- Facilitation of Cases of Academic Dishonesty. Facilitation of any act of academic dishonesty, including cheating, plagiarism, and/or falsification of documents, also constitutes a violation of the university's academic integrity.

Academic Honesty and Integrity

Academic honesty and integrity lie at the heart of any educational enterprise. Students are expected to do their own work and neither give nor receive assistance during quizzes, examinations, or other class exercises. Because the university takes academic honesty seriously, penalties for violations may be severe, including failing the course and possibly being dismissed from the university. Students accused of academic dishonesty will be given due process before disciplinary action is taken. **Please request the most current policy and procedure followed when academic dishonesty accusations are lodged by faculty against students from the faculty member, the academic advisor, or the department chair.**

Precautionary Disclaimer

The instructor reserves the right to amend the course syllabus during the term. If changes must be made, students will be notified. Notice given during class is considered proper notice. Office hours are subject to change depending on the instructor's schedule.

Disability Statement

Students capable of success, regardless of their disabilities, are admitted to the university. The faculty and staff of the University of Maryland Eastern Shore work cooperatively to assist their students in achieving their educational goals. Moreover, students with disabilities are accommodated by following both federal and state laws. To receive special accommodations for a disability, the student must register with Student Disability Services before any accommodations can be granted. At the time of registering for disability services, please bring documentation to support your claimed disability. The documentation must be within three years and provided by a licensed professional with expertise in the specific disability area. If you have questions about disability services or accommodations, please contact Dr. Dorling Joseph at (410) 621-3446. The Student Disability Services office is located in the Student Services Center (SSC), Suite 2169.