ECE 0101　　　　　　　**Linear Circuit & Systems**　　　　　　**Autumn 2024**

Note:　　　This syllabus is subject to changes during the semester. Any changes to the syllabus will be announced in class or posted on the Blackboard course area.

Introduction/Learning Objectives: This course covers the fundamentals of linear electric circuit analysis used throughout the electrical and computer engineering curricula. Students learn basic concepts and terminology of electrical engineering and develop knowledge and skills to analyze, evaluate, and design electrical circuits in class and in an accompanying laboratory where they build prototyping and analysis skills using modern test equipment.

Prerequisites: Phys 0175 and ECE 0401 (desirable)

Applicable ABET Outcomes:
1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Instructor:　　Dr. Lawrence Lam
Office Hours: Mon: 1:30-6:30pm; Tues: 1-1:50pm; Wed: 1-1:50pm & 3:30-4:45pm
Location: SCUPI Rm513
Email: lawrence.lam@scupi.cn **(Please include "ECE 0101" and some topic keywords in the subject line.)**

Teaching Assistants:
Kunyu Wu(for Lectures)
kun122109@qq.com
Office Hour and Location: Thursday 10-11am online

Hong Xi Jiang (for Lab)
2897569973@qq.com
Office Hour and Location: Thursday 10-11am online

Lectures:　　Mon.: 10:15 – 11:55 AM, zone-3, Rm106
Labs:　　　Wed.: 1:50 – 3:30 PM (Section 1), 4:45 – 6:25 PM (Section 2), SCUPI Building Room 206

Textbook: *The Analysis and Design of Linear Circuits* (8th Edition), Roland Thomas, Albert Rosa, and Greg Toussaint, 2016 John Wiley & Sons (ISBN: 978-1-119-23538-5)

Grading:

Homework	24%
Quizzes	6%
Labs	20%
Midterm Ex1	15%
Midterm Ex2	15%
Final Exam	20%

Letter grades will be determined from accumulated point totals and assigned according to the scale below.

A: 90 - 100	A-: 85 - 90	B+: 80 - 85	B: 76 - 80	B-: 73 - 76
C+: 70 - 73	C: 66 - 70	C-: 63 - 66	D: 60 - 63	F: < 60

Note: Up to 5% points could be granted to the final grade based on the overall course performance (lecture attendance, homework submission punctuality, course engagement such as in-class question answering and discussion, etc.).

Homework: Homework problems will be assigned throughout the semester. All finished homework needs to be submitted in pdf file format online by the specified due date. Homework will be graded and solutions for all homework problems will be posted 24 hours after the submission due date. While discussion between students is allowed for solving homework problems, each student must write and submit the homework individually.

Quizzes: In-class quizzes will be arranged prior to exams. Each quiz will have up to a few questions or problems related to the learned content and help the preparation for exams. Each student must complete the quizzes individually.

Exams: There will be midterm exams and one final exam. Exact exam dates will be announced at least one week ahead of time.

Late Work and Make-up Policy: Late homework submission will be accepted up to 24 hours after the due date with a 20% penalty, unless an extension request is approved **prior to the homework due date**. Extensions are granted at the instructor's discretion. In general, **no** make-ups for quizzes and exams will be allowed. Exceptions will only be made for special circumstances such as a medical emergency. All exceptions will need to have documents to validate. If you cannot attend a quiz or an exam, you must contact the instructor prior to the quiz and exam. Failure to do so will result in a zero grade on that quiz or exam.

Grade Rebuttal: For any quiz or exam, you have one week to request correction if you feel your answer might be mis-graded. No correction will be made a week after the quiz or exam grade is posted.

Disability Services: If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact the instructor as early as possible in the semester. Reasonable accommodations will be arranged for this course.

Communication with Instructor for Absence: In any situation regarding class absence, a student who becomes ill or has other emergency issues is responsible for communicating with the instructor. Please contact the instructor or Teaching Assistant via email prior to the lecture or lab to be involved.

Academic Integrity: Students in this course will be expected to comply with the SCUPI and/or University of Pittsburgh's Policy on Academic Integrity. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy.

Audio/Video Recording: To ensure free and open discussion, students may not record lectures, discussions and/or any other class activities without the advance written permission from the instructor, and any such recording properly approved in advance can solely be limited to the student's own private use.

Tentative Course Topics (subject to changes):
- Electric variables and circuit elements
- Kirchhoff's and Ohm's laws
- Mesh and node equations
- Thevenin and Norton equivalent circuits
- First- and second-order circuits
- Time- and frequency-domain analyses
- Ideal transformers, and AC power

Lab Grading

Each lab consists of two part:

- Prelab(20%) done before coming to the lab (signed by the present TA or instructor)
- Lab report (80%) turn in at the due date (late penalty 20% per day)
- Lab demo during midterm and final times (no grade for this but require to pass in order to receive the overall lab grade)

Tentative Course Schedule (subject to change)

Week	ECE0101 (linear Circuit & Systems) Chapter	Topics	Assignment
1	Introduction & Chap1	Syllabus & Introduction to Electric Circuits	
2	1 & 2	Basic Circuit Analysis	HW1
3	2		
4	3	Circuit Analysis Techniques	HW2
5	3 & 4	Active Circuits	
6	4		HW3
7	Midterm 1 & Chap 6	Capacitance & Inductance	
8	6		HW4
9	7	1st & 2nd order Circuits	
10	7 & 8	Sinusoidal steady-state response	HW5
11	8		HW6
12	9	Laplace Transforms	HW7
13	Review & Midterm 2		
14	11	Network Functions	HW8
15	12	Frequency Response	HW9
16	13	Fourier Series	HW10
17	15	Mutual Inductance & Transformers	HW11
18	16	AC Power Systems	HW12
19	Review & Final		
20			

Tentative Lab Course Schedule

Week	ECE0101 (linear Circuit & Systems) Lab (Report 80%)	Topics	Assignment (prelab 20% signed by TA or the instructor in lab)
1	Introduction	Introduction & Group Sorting	
2	1	Equipment & Ohm's Law	
3	2	Series & parallel circuits, current and voltage dividers	HW
4	3	Introduction to circuit simulation (PSPICE)	HW
5			
6	4	Equivalent Circuits	HW
7	5	Power Transfer in circuits	HW
8	6	Oscilloscope and Waveform Generator	
9			
10		Range: lab1-lab6 Individual Demo	
11	7	Transient Response of RC Circuits	HW
12	8	Transient Response of Second-Order Circuits	HW
13	9	AC Phasor Circuit Analysis	HW
14			
15	10	Ideal Transformers	
16	11	Reactive Power Lab	HW
17	12	Frequency Response of Circuits (Part1 & 2)	HW
18			
19	Final	Range: lab7-lab12 Individual Demo	
20			