Sichuan University - Pittsburgh Institute

ECE 1212 **Electronic Circuit Design Lab** **Autumn 2025**

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

Introduction/Learning Objectives: This is a laboratory on electronic circuits experiments with an emphasis on circuit applications and design. Topics include multi-stage amplifier design; operational amplifier applications; analog-digital conversion applications, and active filters.

During this course, you are asked to design and perform seven experiments. Each experiment is introduced during a lecture given during the first portion of the lab. Usually, two students, forming a "group", share responsibility for the execution of the experiment during the lab periods. If extra time is required, the Laboratory is always available except during hours when other classes are in session.

Prerequisites: ECE 0101 and ECE 0102

Applicable ABET Outcomes:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
3. an ability to communicate effectively with a range of audiences.
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 T learning strategies.

Instructor: Dr. Lawrence Lam
Office Hours: Mon and Tue: 1:30-4:30pm; Wed: 1:30pm-3:30pm
Location: SCUPI Rm513
Email: lawrence.lam@scupi.cn **(Please include "ECE 1212" and some topic keywords in the subject line.)**

Teaching Assistants:
HongXi and TingWei (for Labs)
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Kun Wu (for theory)
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Lectures: Tue.: 8:15 – 9:55 AM, SCUPI Building Room N209
Labs: Tue.: 10:15 – 11:55 AM, SCUPI Building Room 206

Reference Textbook: *Microelectronic Circuits* (7th Edition), Sedra, Smith, Carusone, Gaudet, Oxford University Press.

Grading:

Lab Prelab Plans	20%
Lab Final Reports	30%
Quizzes in class (theory)	15%
Performance Evaluation	10%
Final Exam	25%

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.).

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Student endeavors will include:

1. Preparation of work plans (or Prelab) for each experiment (or portion of an experiment). These Prelabs should be based on independent reading, analysis and suggestions given in the lecture. In general, I will lecture on an experiment (or part of an experiment) before the prelab is due. Each group only needs to submit one copy of their pre-lab by one member of the group, however, the name of the other member must be specified in the Pre-lab. Prelabs should be reviewed/graded by the Lab TAs before a group begins execution of the laboratory.

Pre-lab work generally consists of the derivation of design equations, designing the circuits you will later construct, and other types of analysis. Unless otherwise instructed, all circuit designs should use single components of standard values. For example, if your design calls for a resistor of 1050 ohms, you should use a single 1 kilohm resistor during construction. Do not use multiple components in series or parallel unless specifically instructed to do so.

Usually, you have at least two weeks or more to work on one lab, you work on the prelab in week one and/or building the actual circuit in week two or later make up labs. You must submit or show the Lab TA the prelab work before you construct the actual circuit.

2. Conducting the actual experiments in the laboratory. Each group or an individual student must have a laboratory notebook, which can be a written record or a computer file, to record data. Experimental results should be placed in the notebook. The instructor or TAs may examine the notebook during the lab period. **Some elements of each experiment**

must be demonstrated to the Instructor or TAs in the lab. These elements may include live demonstrations of working circuits, showing the required measurements, oscilloscope displays, or other results.

3. Preparation of a Final Report for each experiment (one per group). Each group should submit their lab report by the due time. This report should be prepared separately from the notebook and should be prepared on a word processor in MSWord and then saved in pdf file format to submit. Laboratory reports will be prepared for each full experiment and are usually due as scheduled for completion in the laboratory. The lab report should include the work of the prelab.

Prelab and Lab Reports

1. A format for lab prelabs would be answers and derivation to the questions in the prelab and the formal of the full report will be provided later.
2. The due dates of prelabs and final reports will be posted as assignments.
3. Any prelab report or final report submitted after the due time will be considered late and see the late policy below.

Quizzes and Final Exam

- There are quizzes in most of the week during lecture time and will cover material related to recently completed lecture or laboratory experiment.
- Attendance at the final exam is mandatory. An unexcused absence from this exam will result in a grade of 0.
- Final exam is a written exam and will be based on lectures and experiments covered.

Late Work and Make-up Policy: Late homework submissions will be accepted up to 24 hours after the due date with a 20% penalty unless an extension request is approved **before the homework due date**. Extensions are granted at the instructor's discretion. In general, **no** make-up for quizzes and exams will be allowed. Exceptions will only be made for special circumstances such as a medical emergency. If you cannot attend a quiz or an exam, you must contact the instructor before 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 before the lecture or lab to be involved.

Academic Integrity: Students in this course will be expected to comply with the SCUPI and/or the 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.

Plagiarism

- Students must do their own work. Plagiarism of another student's work or last year's lab work is a serious offense and can result in dismissal from the SCUPI.
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Attendance: Attendance is required for each lecture and lab as part of the performance evaluation. Attendance in the lab will be taken each time. Taking the quiz in lecture and uploading the prelab in lab time as part of the performance.

Audio/Video Recording: To ensure free and open discussion, students may not record lectures, discussions, and/or any other class activities without 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):

- Multi-stage amplifier design
- Operational amplifier applications
- Analog-digital conversions
- Active filters