



Course Code ECE-213	Course Title Electronics II Lab	ECTS Credits 2
Department Engineering	Semester Fall, Spring	Prerequisites ECE-211
Type of Course Required	Field Engineering	Language of Instruction English
Level of Course 1 st Cycle	Year of Study 2 nd	Lecturer(s) Dr Andreas Michaelides
Mode of Delivery Face-to-face	Work Placement N/A	Co-requisites ECE-212

Objectives of the Course:

The main objectives of the course are to:

- Accompany and reinforce concepts introduced during the Electronics II lecture course.
- Provide students with hands-on experience with small-signal transistor amplifiers and operational amplifier applications.
- Relate small-signal models of bipolar transistors and JFETs to their actual behavior in practical electronic circuits.
- Develop the necessary practical skills required for constructing electronic circuits and making measurements using various lab instruments.
- Provide the student with the experience of designing, simulating, constructing, testing and debugging a multistage amplifier circuit.
- Introduce students to common safety and professional practices in electronic engineering.
- Assist students develop written communications skills by writing formal laboratory reports focusing on technical content, organization, completeness, clarity, presentation, accuracy, and promptness.

Learning Outcomes:

After completion of the course students are expected to:

- Demonstrate the ability to use standard laboratory instruments and equipment for building, troubleshooting and measuring the small-signal performance of electronic circuits containing transistors and operational amplifiers.
- Measure and record specific parameters to obtain accurate results containing sufficient details that enable analysis.
- Possess the ability to analyze and design standard transistor amplifiers for low, mid-band and high frequency applications.

- Apply the op-amp as a building block for a multitude of applications.
- Demonstrate critical reasoning and problem solving abilities through the use of software tools to simulate and troubleshoot the dc and small-signal operation of fundamental electronic amplifier circuits.
- Work individually on a direct coupled multistage BJT amplifier design project to employ and demonstrate acquired knowledge on setting bias points for each stage and meeting various ac specifications.
- Communicate their experimental work and findings effectively in written form through a scientific laboratory report.
- Exchange and interact effectively with other students in small teams in ways that contribute to developing working relationships and the achievement of common goals.
- Demonstrate laboratory safety.
- Manage efficiently the use of time and other resources to complete experiments.

Course Contents:

- Laboratory safety guidelines
- Effective technical report writing techniques

Experiments on:

- Common Base Amplifier
- Common Emitter Amplifier
- Common Collector Amplifier
- h - Parameters
- RC Coupled Multistage Amplifier & Darlington Pair Amplifier
- Operational Amplifier/Summation, Integration and Differentiation
- Lower Cutoff Frequency
- Upper Cutoff Frequency
- JFET Amplifier
- Comparators
- Oscillators

Learning Activities and Teaching Methods:

Briefing on the theoretical and technical contents of the experiments, presentation of supplemental information, student discussions, direct instruction and supervision of laboratory work.

Assessment Methods:

Lab reports, lab performance and methodology, final examination.

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Theodore F. Bogart James W. Brown	Experiments in Electronic Devices and Circuits	Prentice Hall	2004	0-13111143-4

Instructor's Notes

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Theodore F. Bogart Jeffrey S. Beasley Guillermo Rico	Electronic Devices and Circuits	Prentice Hall	2004	0131111426
A. S. Sedra, K. C. Smith	Microelectronic Circuits	Oxford University Press	2004	0-19-511663-1