

**LAGUARDIA COMMUNITY COLLEGE
CITY UNIVERSITY OF NEW YORK
MATHEMATICS, ENGINEERING, AND COMPUTER SCIENCE DEPARTMENT**

MAC242 – Computer Electronics II

3 credits; 4 hours (3 lecture, 1 lab)

Prerequisites: MAC241

Catalog Description:

This course is a continuation of Computer Electronics I. Topics covered include parallel resonance, high and low passive filter circuits, transformers, semiconductor structure, diodes, BJTs, FETs, integrated circuits, power supply circuits, transistor amplifier circuits, operational amplifiers, oscillators, and modulation and receiver circuits. This course will emphasize the laboratory construction and troubleshooting of these circuits. The student should expect to pay for additional materials for this course.

Instructional Objectives:

1. Introduce students to semiconductors and the characteristics of electronic components
2. Enable students to analyze diode circuits and power supplies
3. Introduce DC operation of bipolar junction transistors and field-effect transistors
4. Familiarize students with parameters and configurations of operational amplifiers
5. Introduce students to analyze oscillators, modulation and receiver circuits
6. Familiarize students with laboratory construction and troubleshooting of circuits
7. Enable the students to prepare technical reports on circuit analysis and design

Performance Objectives:

1. Explain semiconductors and the characteristics of electronic devices
2. Analyze diode circuits and power supplies
3. Interpret DC operation of bipolar junction transistors and field-effect transistors
4. Describe parameters and configurations of operational amplifiers
5. Analyze oscillators, modulation and receiver circuits
6. Perform laboratory construction and troubleshooting of circuits
7. Draft technical reports on circuit analysis and design

Textbook:

Floyd, Thomas L. and Buchla, David M., Electronics Fundamentals: Circuits, Devices, and Applications, 8th edition, Prentice Hall, 2010, ISBN: 978-0-13-507295-0.

Buchla, David M., Experiments in Electronics Fundamentals and Electric Circuits Fundamentals, 8th Edition, Prentice Hall, ISBN: 9780135063279.

Evaluation:

Lab projects (4 total at 5% each)	20%
Midterm exam	40%
Final exam	40%
Total	100%

Academic Integrity:

This class will be conducted in compliance with LaGuardia Community College's academic integrity policy.

Attendance:

The maximum number of unexcused absences allowed is 15% of the total class meetings. Unexcused absences beyond this maximum will result in a grade of WU or F.

Comments:

The grading standards listed above and the contents listed in the course outline are both subject to modification by the instructor.

COURSE OUTLINE

Week	Topic
1	Introduction to semiconductors, diode characteristics, power supplies
2	Special purpose diodes, troubleshooting power supplies and diode circuits
3	DC operation of bipolar junction transistors (BJTs), BJT amplifiers
4	DC operation of field-effect transistors (FETs), FET amplifiers, feedback oscillators
5	Operational amplifier, differential amplifier
6	Op-Amp parameters, Op-Amp configurations with negative feedback, Op-Amp resistances
7	Review on diodes, transistors and operational amplifiers, Midterm Exam
8	Comparators, summing amplifiers, integrators and differentiators
9	Oscillators, active filters, voltage regulators
10	Instrumentation amplifiers, isolation amplifiers, operational transconductance amplifiers
11	Active diode circuits, current sources and converters, temperature/motion measurement
12	Sample-and-hold circuits, analog-to-digital conversion, power-control circuits
13	Review on electronic devices, Final Exam