

Common Course Outline
ELEI 115/ENSC 115
Electronic Circuits I
3 Credits

Community College of Baltimore County

Description

ELEI 115/ENSC 115 – Electronic Circuits I is a course in which students develop fundamental as well as practical skills for designing, analyzing and troubleshooting analog components and circuits, including diodes, transistors, field effect transistors (FETs), small and large signal amplifiers, and oscillators. An introduction of integrated circuit fabrication techniques and thyristors is provided.

3 Credits: *2 lecture hours per week; 2 lab hours per week*

Prerequisites: ELEI 114/ENSC 114

Overall Course Objectives

Upon completion of this course students will be able to:

1. develop an advanced system viewpoint of troubleshooting;
2. describe a semiconductor, identify semiconductor devices and demonstrate their operation;
3. demonstrate the principles of semiconductor diode operations and diode half wave rectification using diode test circuits;
4. test transistors and demonstrate a transistor switch using NPN and PNP transistor circuits;
5. demonstrate how operating conditions and gain affect transistor circuit currents using a transistor direct current (DC) load line;
6. evaluate transistor specifications sheets;
7. demonstrate full wave rectification, filtering, using calculated and measured circuit conditions;
8. troubleshoot various rectifier circuits to a faulty component given the proper test equipment;
9. describe the operation of common amplifier configurations;
10. compare various amplifier coupling techniques;
11. evaluate various power amplifier configurations such as the push-pull, complementary, and single ended, and Darlington Pair power amps;
12. describe the operation of FET circuits and components; and
13. test and evaluate thyristor and power control techniques using silicon-controlled resistors (SCRs), unijunction transistors (UJTs) and other triac devices.

Major Topics

- I. Problem solving approaches to troubleshooting (systems and other approaches)
- II. Semiconductors
- III. Diodes
- IV. Transistors
- V. Power supplies
- VI. Amplifiers
- VII. Power amplifiers
- VIII. FETs
- IX. Thyristors and other triac devices

Course Requirements

Grading procedures will be determined by the individual faculty member but will include the following:

Grading/exams

- A minimum of 3 homework assignments
- A midterm and a final exam
- A minimum of 4 troubleshooting and/or lab assignments
- A minimum of 3 technical reports
- A minimum of 3 lab reports

Written Assignments: Students are required to use appropriate academic resources.

Other Course Information

This course is a required core course for the Engineering Technology Electronics/Electrical Engineering Option. This course is offered once a year in the fall or spring. Components of this course are taught in a computerized lab environment. ELEI 115 is the same as ENSC 115. Credit earned for one only.