

**MIAMI UNIVERSITY
SCHOOL OF ENGINEERING AND APPLIED SCIENCE
DEPARTMENT OF ENGINEERING TECHNOLOGY**

ENT 196	ELECTRONICS	3
Course Number	Title	Credit Hours

DESCRIPTION:

Detailed study of analog electronic circuits and devices. Emphasis is placed on the operating parameters of linear (analog) circuits; techniques of circuit analysis are applied as an integral part of the course. The use of computerized data analysis is encouraged.

PREREQUISITES: ENT 192, MTH 125

TEXT MATERIAL:

- Malvino, Albert P., Electronic Principles, sixth edition, Glencoe McGraw-Hill, Columbus, 1993
- Malvino & Johnson, Experiments for Electronic Principles, sixth edition, Glencoe McGraw-Hill, Columbus, 1993

REFERENCE MATERIAL:

- Thomas L. Floyd, Electronics Fundamentals: Circuits, Devices and Applications, fifth edition, Prentice Hall, 2001.
- Robert L. Boylestad, Electronic Devices and Circuit Theory, eighth edition, Prentice Hall, 2002

COURSE OBJECTIVES:

Upon completion of this course students will develop:

- a. An understanding of the principles of electronics circuits and operation of devices.
- b. An understanding of the application of circuit analysis techniques in electronics circuits.

OUTCOMES: This course addresses the following outcomes planned for the ECET program.

- Knowledge of analog electronic theory
- Knowledge of electrical/computer engineering safety
- Knowledge of professional and ethical responsibility
- Ability to construct and analyze electronic circuits
- Ability to effectively use electrical/electronics measurement tools
- Ability to apply troubleshooting techniques in the identification and correction of faults in a safe and proficient manner in electronic circuits
- Ability to conduct experiments, obtain data and make improvements in designs
- Ability to produce written documents
- Ability to prepare and deliver oral presentations
- Proficiency in the concepts of electrical and computer engineering technology
- Effective teamwork skills
- Commitment to quality, timeliness, and continuous improvement

MEETING PLACE AND TIME:

The course meets one day per week for 3 hours and 40 minutes.

TOPICAL OUTLINE AND SCHEDULE:

Week 1:	Introduction to voltage and current sources and theorems
Week 2:	Introduction to semiconductors
Week 3:	Diode theory
Week 4:	Diode Circuits
Week 5:	Diode Circuits
Week 6:	Diode applications
Week 7:	Transistor basics
Week 8:	Transistor characteristics
Week 9:	Biasing, Midterm exam
Week 10:	Spring Break
Week 11:	AC models
Week 12:	Voltage amplifier
Week 13:	Power amplifier
Week 14:	MOSFETs basics
Week 15:	Operational Amplifiers
Week 16:	Review

Lab 1:	Voltage and current sources and Thevenin's theorem (Exp 1, 2, from Melvino lab manual. Note: troubleshooting, critical thinking, Application, computer are excluded)
Lab 2:	Semiconductor diodes and diode curves (Exp 4, 5, from Malvino lab manual. Note: troubleshooting, critical thinking, Application, computer are excluded)
Lab 3:	Rectifier circuits (Exp 7, from Malvino lab manual)
Lab 4:	The capacitor-input filter (Exp 8, from Malvino lab manual)
Lab 5:	Clipper circuits (Handout)
Lab 6:	The Zener regulator (Exp 13, from Malvino lab manual)
Lab 7:	Transistor operating regions (Exp 16, from Malvino manual)
Lab 8:	Coupling and bypass capacitor (Exp 22, from Malvino manual)
Lab 9:	Design of common emitter amplifier (Handout)
Lab 10:	Introduction to op-amp circuit (Experiment 40, from Malvino manual)
Lab project:	Handout