

**MIAMI UNIVERSITY
SCHOOL OF 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 placed on operating parameters of linear (analog) circuits; techniques of circuit analysis applied as an integral part of the course. Use of computerized data analysis encouraged.

PREREQUISITE: ENT 192

This course is a prerequisite to ENT 291 Industrial Electronics.

TEXT AND COURSE MATERIALS:

Electronics Devices (Conventional Current Version), 8th edition, Thomas L. Floyd, Yueming Yu, Yanhui Zhang, Pearson, 2007, ISBN-13: 9780132429733.

Laboratory Exercises for Electronic Devices, 8th edition, David M. Buchla and Steve Wetterling, Prentice Hall, 2007, ISBN-13: 978-0132429719

References:

Electronics Devices and Circuit Theory, 10th edition, Robert L. Boylestad and Louis Nashelsky, Prentice Hall, 2009

Fundamentals of Analog Circuits, 2nd edition, Thomas L. Floyd and David M. Buchla, Prentice Hall, 2001

Electronic Principles, 7th edition, Albert Paul Malvino and David J Bates, McGraw Hill Higher Education, 2006

COURSE OBJECTIVES:

- To understand the vocabulary of semiconductor and analog circuit design.
- To understand how to design the peripheral circuitry required to produce useful active analog circuits using diodes, transistors, thyristors and integrated circuits.
- To learn how to design, assemble, analyze, test and repair semiconductor circuits.
- To understand how to design active analog circuits to handle different frequency requirements, power output loads, thermal environments, applications, and electrical noise interference.
- To learn to analyze an analog circuit to determine its operating parameters, and to predict if the circuit will be stable or oscillatory.

OUTCOMES:

Students completing this course will have an understanding of, and ability to apply:

- Semiconductor properties
- Diode applications
- Special-purpose diodes
- Bipolar junction transistors (BJTs)
- BJT biasing circuits and stability
- BJT amplifier circuits
- Multistage amplifier design
- Power amplifiers
- Field effect transistors (FETs)
- JFET and MOSFET biasing circuits
- FET amplifier circuits

- Frequency analysis
- Thyristors and applications
- Negative and positive feedback concepts
- Op-Amps, circuits and applications
- Oscillators
- Op-Amps, circuits and applications
- Electronically regulated power supplies

MEETING PLACE AND TIME:

Class meets once per week for three hours and 40 minutes.

Course outline

Week	Topics	Chapters	Labs
1	Introduction to Semiconductors	Ch 1	Lab#1 Introduction to Semiconductor
2	Diode Applications	Ch 2	Lab#2 Diode Applications
3	Special-Purpose Diodes	Ch 3	Lab#3 Special-Purpose Diodes
4	Bipolar Junction Transistors	Ch 4	Lab#4 Bipolar Junction Transistors
5	Transistor Bias Circuits	Ch 5	Lab#5 Transistor Bias Circuits
6	BJT Amplifiers	Ch 6	Lab#6 BJT Amplifiers
7	Power Amplifier	Ch 7	Lab#7 Power Amplifier
8	Field Effect Transistors (FETS)	Ch 8	Lab#8 Field Effect Transistors (FETS)
9	FET Amplifiers and Switching Circuits	Ch9	Lab# FET Amplifiers and Switching Circuits
10	Amplifier Frequency Response Section 10.1-10.3	Ch10	Lab # 10 Part 1 : Low Frequency Response
11	Thyristors	Ch11	Lab#11 Thyristors
12	Operational Amplifier Section 12.1-12.4	Ch12	Lab#12 Operational Amplifier
13	Oscillators	Ch16	Lab#16 Oscillators
14	Voltage Regulators	Ch17	Lab#17 Voltage Regulators
15	Review and Final Exam		