ELECTRONIC DEVICES AND CIRCUITS LABORATORY

III Semester: ECE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
AECC05	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		0	0	3	1.5	30	70	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 36**				**Total Classes:36**		

Prerequisite: There are no prerequisites to take this course.

I. COURSE OVERVIEW:

The objective of this course is to meet the requirements of practical work meant for components basics, analysis and design. It provides hands-on experience by examining the electrical characteristics of various semiconductor devices, such as diodes, BJTs and FETs and measuring instruments. Analyze the characteristics of pn diode, Zener diode, unipolar, bipolar transistors, design rectifiers without and with filters and frequency response of amplifiers. Provide the student with the capability to use simulation tools for performing various analysis of semiconductor devices applications.

II. COURSE OBJECTIVES:

The students will try to learn:

    I.   Implement and study the characteristics of Diodes and Transistors.
    II. Illustrate the concept of rectification using half wave and full wave rectifiers.
    III. Design and Construct different amplifier circuits.

III. COURSE SYLLABUS:

Week – 1: ELECTRONIC WORKSHOP PRACTICE

Identification, specifications, testing of R, L, C components (Color Codes), potentiometers, switches (SPDT, DPDT and DIP), coils, gang condensers, relays, bread boards, PCBs, identification, specifications and testing of active devices, diodes, BJTs, low power JFETs, MOSFETs, power transistors, LEDs, LCDs, optoelectronic devices, SCR, UJT,DIACs.

Week – 2: ELECTRONIC WORKSHOP PRACTICE

Study and operation of
    a. Multimeters (Analog and Digital)
    b. Function Generator
    c. Regulated Power Supplies
    d. Study and Operation of CRO

Week – 3: PN DIODE CHARACTERISTICS

Verification of V-I characteristics of PN diode and calculate static and dynamic resistance using hardware and digital simulation.

Week – 4: ZENER DIODE CHARACTERISTICS AND VOLTAGE REGULATOR

Verification of V-I characteristics of Zener diode and perform Zener diode as a Voltage regulator using hardware and digital simulation.

Week – 5: HALF WAVE RECTIFIER

Verification of half wave rectifier without and with filters using hardware and digital simulation.

Week – 6: FULL WAVE RECTIFIER

Verification of Full Wave Rectifier without and with filters using hardware and digital simulation.

Week – 7: TRANSISTOR CB CHARACTERISTICS

Verification of Input and Output characteristics of CB configuration using hardware and digital simulation.

Week – 8: TRANSISTOR CE CHARACTERISTICS
Verification of Input and Output Characteristics of CE configuration using hardware and digital simulation.

Week – 9: FREQUENCY RESPONSE OF CE AMPLIFIER
Determine the Gain and Bandwidth of CE amplifier using hardware and digital simulation.

Week – 10: FREQUENCY RESPONSE OF CC AMPLIFIER
 Determine the Gain and Bandwidth of CC amplifier using hardware and digital simulation.

Week – 11: UJT CHARACTERISTICS
Verification of V-I Characteristics of UJT using hardware and digital simulation.

Week – 12: SCR CHARACTERISTICS
Verification of V-I Characteristics of SCR using hardware and digital simulation.

Week – 13: FET CHARACTERISTICS
Verification of V-I Characteristics of FET using digital simulation.

Week – 14: FREQUENCY RESPONSE OF CS AMPLIFIER
Determine the Gain and Bandwidth of CS amplifier using digital simulation.

Week – 15: FREQUENCY RESPONSE OF CD AMPLIFIER
Determine the Gain and Bandwidth of CS amplifier using digital simulation.

IV. REFERENCE BOOKS:

1. J. Millman, C.C.Halkias, Millman's,"Integrated Electronics",Tata McGraw Hill,2nd Edition, 2001.
2. J. Millman, C.C.Halkias and Satyabrata Jit, "Millman's Electronic Devices and Circuits", Tata McGraw Hill, 2ndEdition, 1998.
3. Mohammad Rashid, "Electronic Devices and Circuits", Cengage learning, 1st Edition, 2014.
4. DavidA. Bell,"ElectronicDevicesandCircuits",OxfordUniversityPress,5thEdition, 2009.

V. WEB REFERENCES:

 1.   https://archive.org/details/ElectronicDevicesCircuits
 2.   http://www.tedpavlic.com/teaching/osu/ece327/