PARVATHANENI BRAHMAYYA
SIDDHARTHA COLLEGE OF ARTS & SCIENCE
Autonomous
Siddhartha Nagar, Vijayawada–520010
Re-accredited at 'A+' by the NAAC

Course Code				23PHMAL233			
Title of the Course				ELECTRONIC DEVICES AND CIRCUITS			
Offered to: (Programme/s)				II B.Sc. (Hons) PHYSICS			
L	0	**T**	0	**P**	2	**C**	1
Year of Introduction:		2024-25		Semester:			3
Course Category:		MAJOR		Course Relates to:			
Year of Revision:		NA		Percentage:		NA	
Type of the Course:				EMPLOYABILITY			
Crosscutting Issues of the Course :				NA			
Pre-requisites, if any				BASIC KNOWLEDGE			

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	introduce semiconductor devices PN Junction Diode and Zener Diode, their characteristics, operations, circuits and applications.
2	analysis the CB & CE transistor configurations
3	analyse and interpret FET and UJT Charteristics.
4	analyse the characteristics of Photo Electric Devices.
5	study the efficiencies of different rectifiers circuits.

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Analyze and design electronic circuits using diodes,	K4	PO2	PSO1
CO2	Understand the importance of biasing and stability in electronic circuits and how to achieve them.	K2	PO2	PSO2
CO3	Understanding the characteristics of FET and UJT Charteristics	K2	PO2	PSO1
CO4	Evaluating the characteristics of Photo Electric Devices	K5	PO2	PSO2
CO5	Understanding the efficiencies of rectifiers	K2	PO2	PSO2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX									
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2
CO1		3						2	
CO2		2							2
CO3		2						2	
CO4		3							3
CO5		1							2

Use the codes 3, 2, 1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Course Structure

This lab list covers the key areas of a ELECTRONIC DEVICES & CIRCUITS…. (title of the course) course, providing hands-on practice with Technology(technology/software)

Unit 1: PN JUNCTION DIODES   (6Hrs)

Lab 1: V-I Characteristics of junction diode
Tasks: Students can analyze the V-I characteristics of a PN junction diode by using a simple circuit setup. They can measure the voltage across the diode for different values of forward and reverse bias currents and plot the corresponding current-voltage graph. They can discuss the behavior of the diode in different bias conditions

Lab 2: V-I Characteristics of Zener diode
Tasks: Students can analyze the V-I characteristics of a Zener diode by using a simple circuit setup. They can measure the voltage across the diode for different values of forward and reverse bias currents and plot the corresponding current-voltage graph. They can discuss the behavior of Zener diode

Unit II: TRANSISTOR AND ITS BIASING

Lab 3: Transistor characteristics – CB configuration
Tasks: Students can analyze the CB transistor configurations using a transistor tester or a circuit setup. They can measure and compare the input/output characteristics, gain, and voltage levels for each configuration. They can discuss the advantages and disadvantages of each configuration.

Lab 4: Transistor characteristics – CE configuration
Tasks: Students can analyze the CE transistor configurations using a transistor tester or a circuit setup. They can measure and compare the input/output characteristics, gain, and voltage levels for each configuration. They can discuss the advantages and disadvantages of each configuration.

UNIT-III TRANSISTORS & POWER ELECTRONIC DEVICES

Lab 5: UJT characteristics
Tasks: To study and plot the emitter characteristics of a UJT and to find the peak voltage and valley points.

Lab 6: FET input & Output Charteristics

Tasks: Students can analyze the transfer characteristics of a FET by measuring the drain current (ID) for different gate-source voltages (VGS). They can plot the transfer characteristic curve and observe the variations in ID with VGS. They can discuss the operation modes of FETs based on the transfer characteristics

UNIT-IV: PHOTO ELECTRIC DEVICES

Lab 7: LDR characteristics
Tasks: Students can set up simple LDR circuits to demonstrate their operation. They can observe the emission of light from an LDR when a suitable voltage is applied and measure the current. They can also detect light using a photodiode and measure the output current for different light intensities.

Lab 8: LED characteristics
Tasks: Students can set up simple LED and photodiode circuits to demonstrate their operation. They can observe the emission of light from an LED when a suitable voltage is applied and measure the current. They can also detect light using a photodiode and measure the output current for different light intensities.

Lab 10: Bridge rectifier with filters
Tasks: Students can analyze the efficiency of different rectifier circuits and bridge rectifiers by measuring the input and output power. They can calculate the rectifier efficiency and compare the results for different rectifier configurations. They can discuss the factors affecting efficiency and the importance of regulation

References:

1. C.L. Arora 2020, B.Sc. Practical Physics Edition, S. Chand Company LTD.

2. M.N. Srinivasan, S. Balasubramanian, R. Ranganathan 2022, A Text Book of Practical Physics, Sultan Chand

Note :

1. 9 (NINE) experiments are to be done and recorded in the lab. These experiments will be evaluated in CIA.
2. For certification minimum of 7 (Seven) experiments must be done and recorded by student who had put in 75 % of attendance in the lab.
3. 15 marks = 15 marks for CIA
4. 35 marks for practical exam.

The marks distribution for the Semester End practical examination is as follows:

Formula/ Principle / Statement with explanation of symbols	05
Diagram/Circuit Diagram / Tabular Columns	05
Setting up of the experiment and taking readings/Observations	10
Calculations (explicitly shown) + Graph + Result with Units	05
Procedure and precautions	05
Viva-voce	05
Total Marks:	35

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