

Learning Outcomes:

The educational objectives of the course are to educate students to attain the following:

- Understanding use of basic linear components in relevant applications.
- Students will be able to design the transistor based amplifier circuits.
- Understand and design various oscillators and power amplifiers for various biomedical applications.
- To understand the usage of PNP devices, their characteristic performance and application in circuit design.

SYLLABUS

Unit No.	Topics	Lectures (Hours)
	Introduction to the overview and importance of the course.	
1	DIODE AND ITS APPLICATION: Basic p-n junction diode construction and its VI characteristics, Zener and avalanche breakdown, Zener diode as voltage regulator, Clipper and Clamper circuits	4
2	BJT TRANSISTOR AND BIASING CIRCUITS: Transistor basic construction & working, CB-CC-CE configuration with input output characteristics, operating point and its stability, DC load-line analysis, thermal runaway; Transistor biasing: fixed, emitter, voltage divider circuits with their designing, Darlington pair transistor	6
3	BJT TRANSISTOR MODELING: The <i>re</i> Transistor Model – CB and CE configuration with i/p - o/p impedances and voltage gain parameters. Hybrid equivalent model : Basic two port system , CB and CE configuration with i/p - o/p impedances and voltage gain parameters	4
3	OSCILLATORS AND FEEDBACK: Positive and negative feedback with its advantages and disadvantages, types of negative feedback circuits; Oscillators: Barkhausen criterion, Classification, RC phase shift oscillator, Wein bridge oscillator, Colpitt oscillator, Hartley oscillator, Crystal Oscillator	6
4	POWER AMPLIFIER: Class A power amplifier - series-fed & transformer-coupled power amplifier with overall efficiency calculations, Class B – Push-Pull and complementary push-pull amplifiers, Class AB operation and cross over distortion.	6
5	FIELD EFFECT TRANSISTOR: JFET - Construction and working operation, Drain and transfer characteristics and MOFSET: Construction and working of D-MOSFET and E-MOSFET	4
6	PNPN DEVICES: Thyristor classification, Silicon Controlled Rectifier (SCR): Construction, working; SCR characteristics – Forward breakdown voltage (VBO), Holding current (I _h), Reverse breakdown voltage; DIAC and TRIAC – construction and operation & application.	4

7 UNIJUNCTION TRANSISTOR (UJT):

2

Basic construction and operation, UJT characteristics – Intrinsic standoff ratio, UJT relaxation oscillator.

Term Work And Practical Based On Above Course.

Text Books:

1. Electronic Devices and Circuits. By: *Robert Boylestad and Louis Nashelsky.*
2. Electronic Principles. By: *A.P.Malvino*

Reference Books:

1. Electronics Devices. By: *Thomas Floyd*
2. Integrated Electronics: (McGraw Hill) By: *Millman and Halkias.*
3. Electronic Devices and Circuits By: *David A. Bell*