Course Code: EITS - 109
Course Title: Analog Electronics

Number of Credits: 03 **Total Hours: 42** **Total Marks: 75**

Prerequisites for the course

Students should have some basic idea of electrical concepts and some basic knowledge of electronics.

Objectives of Course

This course is intended to give fundamentals of electronics components such as diodes, transistors, power supply and amplifiers. To understand the working of different circuits based on these electronics components.

Course Content

Unit I	**Introduction to semiconductor diode**	**10 Hours**
Intrinsic and extrinsic semiconductors, P and N type semiconductor, P.N. junction, barrier potential, effect of temperature, breakdown voltage, Forward and reverse bias, Half wave, full wave rectifiers and bridge rectifiers, filters for rectifiers, Zener diode.		
Unit II	**Introduction to Transistor and Amplifiers**	**6 Hours**
Working principle of Transistor, NPN and PNP transistor, transistor amplifier (CE, CB and CC).		
Unit III	**Introduction to Power Supply**	**6 Hours**
Unregulated and regulated DC power supply specifications, Application of different types of power supply, Short circuit protection, Overload protection, Fixed and variable voltage regulators, SMPS.		
Unit IV	**Basic Amplifier and feedback**	**12 Hours**
Gain, I/O resistance, Classes of amplifier, Decibel, Amplifier bandwidth. Types of feedback, Voltage and current feedback, series and shunt feedback. Barkhausen criterion, types of oscillators.		
Unit V	**Linear IC's and Operation Amplifiers**	**8 Hours**
Differential Amplifier, OP-Amp characteristics, Differential and Common mode gains, CMRR, Slew rate, virtual ground, inverting and non Inverting amplifier, Applications of op-amps.		

Pedagogy

Lectures/Tutorial/Assignments

Course Outcome

On completion of the course, students will be able to understand the basic electronics components such as diodes, transistors, power supply Op-amps etc. Students will be able to design the amplifiers using transistor and op-amps.

References/Readings

1. Principle of electronics by V. K. Mehta
2. Electronics devices by Thomas. L. Floyd
3. Basic electronics for scientist and engineers by Dennis Eggleston
4. The Art of electronics by Thomas c Hayes and Paul Horowitz
5. J. Millman and C. C. Halkias, Integrated Electronics: Analog and Digital Circuits and Systems, Mc Graw Hill International Student Ed. (1972).