Basic Electronics

Subject code:EC-10001 Credit:2

Prerequisite: None

Course Objective:

To introduce Electronics in all fields of Engineering.Ability to carry out research in fields of semiconductor devices and pursue advanced degrees in engineering.Ability to utilize the knowledge in solving practical problems in real life.

Course Outcomes:

CO1:To understand the properties of semiconductors .

CO2:To analyze different types of diodes, study of simple electronic circuits using diodes.

CO3:Different types of transistor , its configurations.Application of transistor in amplifier and switch.

CO4:The ability to know about OP-AMP and its applications.

CO5:To understand different types of digital gates .Its application in digital circuits.

CO6:Realize the importance of various analog and digital electronic systems, and electronic devices.

Detailed subject

Unit 1: Properties of semiconductor material and it application as p-n junction diode, diode characteristics and Breakdown mechanisms, Half-wave, full-wave rectifiers with filters, Zener diode.Transistor constructions, operations and their characteristics.Transistor Biasing ,amplifiers,load line analysis, Concept of JFET and MOSFET.(14hrs)

Unit 2: Operational Amplifier (Op-amp) and application: - Introduction to Op-amp and its Characteristics . Application of Op-Amp as Inverting amplifier, Non-inverting Amplifier, Summing,Difference amplifier and comparator.(6 hrs)

Unit 3: Introduction to Digital Electronics:- Different number systems and its conversions, Logic gates and truth tables of OR, AND, NAND, EX-OR. Combinational circuit and Sequential circuit.(6hrs)

Unit 4: Miscellaneous Electronic Devices:- SCR,opto-electronic devices and fiber techniques, Introduction and describing sensor performance,Fundamentals of Analog communication techniques (AM, FM) (4hrs)

Text Books:

- Fundamentals & Applications – D. Chattopadhyay and P. C. Rakshit (New Age Intl)

Reference Books:

- Electronic Devices & Circuits – R. L. Boylestad & L. Nashelsky (PHI)
- Electronic Devices and Circuits – D. A. Bell (Oxford)
- Integrated electronics:Analog and digital circuits and Systems – Jacob Millman,Christos C. Halkias & Chetan D. Parikh(TMH)