EEE 1251

Electronic Devices and Circuits

Contact Hours/Week: 3 Hours

Credit Hour: 3.00

Course Contents:

Introduction to Semiconductors & Diode: P-N Junction Diode, V-I Characteristics, Light-Emitting Diode (LED), Zener Diode, Diode Applications: Half-Wave and Full-Wave Rectifiers – Operation and Efficiency, Ripple factor.

Linear Wave Shaping: Diode Wave Shaping Techniques, Clipping and Clamping Circuits, Voltage Regulation using Zener Diode.

Bipolar Junction Transistor: NPN and PNP Transistors, Amplifying and Switching Actions of Transistor, Transistor Characteristics and Regions of Operation, CB, CE & CC Configurations, Transistor Load Line and Operating Point, BJT Biasing, Small Signal Equivalent Circuit Models, Small-Signal Analysis of Single-Stage Amplifiers, Designing Logic Gate using BJT.

Field Effect Transistor: Principle of Operation of JFET and MOSFET, Depletion and Enhancement Type NMOS and PMOS, MOSFET as switch and amplifier, CMOS Inverter.

Op-amp: Basic OP-amp Characteristics, Gain, Input and Output Impedance, Feedback, Inverting and Non-Inverting Amplifiers, Integrators, Differentiators, Summing Amplifiers, Introduction to Oscillators, Comparator Circuits, Schmitt Trigger, Linear and Non-Linear Applications of Op-amp.

555 Timer: Architecture of 555 Timer, Monostable, Bistable and Astable Multivibrators using 555 Timer.

Filter Circuits: Filter Fundamentals, Different Types of Filters, Passive Filters, Active Filters.

Power Electronic Devices: SCR, TRIAC, DIAC, UJT Characteristics and Applications; Introduction to IC Fabrication Techniques.