TEC-101/201 Fundamental of Electronics Engineering
Course Contents

UNIT-1

Semiconductor materials and properties **6L**

Group-IV materials, Covalent bond, electron-hole concepts Basic concepts of energy bands in materials, concepts of forbidden gap Intrinsic and extrinsic semiconductors, donors and acceptors impurities

UNIT-2

Junction diode **6L**

p-n junction, depletion layer, v-i characteristics, diode resistance, capacitance diode ratings (average current, repetitive peak current, non-repetitive current, peak-inverse voltage).

Diode Applications **6L**

Rectifiers (half wave and full wave), calculation of transformer utilisation factor and diode ratings, filter (C – filter), calculation of ripple factor and load regulation clipping circuits, clamping circuits, voltage multipliers

UNIT-3

Breakdown diodes **4L**

Breakdown mechanisms (zener and avalanche), breakdown characteristics, zener resistance, zener diode ratings, zener diode application as shunt regulator

UNIT-4

Bipolar Junction Transistor **6L**

Basic construction, transistor action, CB, CE and CC configurations, input/output Characteristics, concept of Biasing of transistors-fixed bias, emitter bias, potential divider bias

Transistor Amplifier

Graphical analysis of CE amplifier, concept of voltage gain, current gain, h-parameter model (low frequency), computation of Ai, Av, Ri, RO of single transistor CE and CC amplifier configurations.

Field Effect Transistor **6L**

JFET: Basic construction, transistor action, concept of pinch off, maximum drain saturation current, input and transfer characteristics, characteristics equation CG, CS and CD configurations, Introduction to self and fixed biasing MOSFFT: depletion and enhancement type MOSFET-construction, operation and characteristics. Computation of Av, Ri, Ro, of single FET amplifiers using all the three configurations

Unit-5

Switching theory and logic design **4L**

Number systems, conversions of bases, Boolean algebra, logic gates, concept of universal gate, concept of K- Map

Operational Amplifiers **4L**

Concept of ideal operational amplifiers, ideal op-amp parameters, inverting, non-inverting and unity gain amplifiers, adders.