



EC 222

BASIC ELECTRONICS
(For Mech., Prod., and CSE)

Course objectives:

- Analyze the behavior of semiconductor diodes in Forward and Reverse bias.
- Design of Half wave and Full wave rectifiers with L,C, LC & CLC Filters.
- Explore V-I characteristics of Bipolar Junction Transistor in CB, CE & CC configurations.
- Explain feedback concept and different oscillators.
- Analyze Digital logic basics and Photo Electric devices.

UNIT-I

Semi Conductor Theory: Energy Levels, Intrinsic and Extrinsic Semiconductors, Mobility, Diffusion and Drift current. Hall Effect, Characteristics of P-N Junction diode, Parameters and Applications.

Rectifiers: Half wave and Full wave Rectifiers (Bridge, center tapped) with and without filters, ripple regulation and efficiency. Zener diode regulator.

UNIT-II

Bipolar Junction Transistor:BJT, Current components, CE, CB, CC configurations, characteristics, Transistor as amplifier. Analysis of CE,CB,CC Amplifiers(qualitative treatment only).

JEET: Construction and working, parameters, CS, CG, CD Characteristics, CS amplifier.

UNIT-III

Feedback Concepts – Properties of Negative Feedback Amplifiers,Classification, Parameters .

Oscillators – Barkhausen Criterion, LC Type and RC Type Oscillators and Crystal Oscillators. (Qualitative treatment only)

UNIT-IV

Operational Amplifiers – Introduction to OP Amp, characteristics and applications – Inverting and Non-inverting Amplifiers, Summer, Integrator, Differentiator, Instrumentation Amplifier.

Digital Systems: Basic Logic Gates, half, Full Adder and Subtractors.

UNIT-V

Data Acquisition systems: Study of transducer (LVDT, Strain gauge, Temperature, Force).

Photo Electric Devices and Industrial Devices: Photo diode, Photo Transistor, LED, LCD, SCR, UJT Construction and Characteristics only.

Display Systems: Constructional details of C.R.O and Applications.

Suggested Reading:

1. Jacob Millman, Christos C. Halkias and SatyabrataJit, *Electronics Devices and Circuits*, 3rd edition, McGraw Hill Education(India) Private Limited, 2010.

2. Rama Kanth A. Gaykward, *Op-AMPS and Linear Integrated Circuits* 4th Edition Prentice Hall of India 2000.

3. M. Morris Mano, *Digital Design*, 3rd Edition, Prentice Hall of India 2002.

4. William D Cooper, and A.D. Helfrick, *Electronic Measurements and Instrumentations Techniques*, 2nd ed., Prentice Hall of India 2008

5. S. Shalivahan, N. Suresh Kumar, A. Vallava Raj, *Electronic Devices and Circuits*, 2nd ed., McGraw Hill Education(India) Private Limited, 2007.