

## **Course 9: Electronics**

**Course code: MSCPH509**

**Credit: 3**

### **BLOCK 1 Analog electronics**

**Unit –1: Semiconductor devices:** Semiconductor devices, homo and hetero junction devices, p-n junctions, Zener diode, light emitting diode, Tunnel diode, Photodiode, Solar cell IMPATT diodes, clipping circuits, comparator, voltage regulator, frequency dependence and application of devices, frequency dependence and application of devices.

**Unit –2: Transistors and amplifier:** Transistors, transistor as an amplifier, low frequency transistor equivalent circuits, switching behaviour of transistor, biasing schemes, Feed back in amplifiers with example.

**Unit –3: FET and MOSFET:** FET, static and dynamic characteristics for smaller drain voltage and larger drain voltages, FET amplifier, MOSFET, drain and transfer characteristics Amplifier; Q – point, AC load line. Depletion and enhancement mode.

### **BLOCK 2 OP-AMP**

**Unit –4: Operational amplifier:** Introduction to Operational amplifier, 741 general purpose Op amplifier, Packaging and Pinouts, Op Amp Terminals, Open loop voltage gain, Zero crossing detectors, Positive and negative voltage level detector.

**Unit- 5: Inverting and Noninverting Amplifiers:** Inverting Amplifiers, Noninverting Amplifiers, Differential amplifiers. amplifiers, adder, subtractor; comparator; logarithmic amplifiers. multiplier; divider; differentiator, integrator; analog computer; wave shapers

**Unit- 6: Application of OP Amplifier:** Introduction, High resistance DC voltmeter, Universal high resistance voltmeter, Light Emitting diode tester, Current Amplifier, phase shifter.

### **BLOCK 3 Integrated Circuit**

**Unit 7: Integrated Circuit Technology :** Classification of IC's, Fabrication of IC's & components, Basic monolithic integrated circuit technology, processes used in monolithic technology, active & passive components, metal semiconductor contact, thick & thin film IC's, hybrid IC's, charge coupled devices (CCD), advantages & limitations of integrated circuits .

#### **Reference Books:**

1. Electronic Devices and Circuits: S Salivahanan and N Suresh Kumar.
2. Physics of Semiconductors Devices: Sze.
3. Op-Amps and Linear Integrated Circuits: Gayakwad.
4. Digital Fundamental: Floyd.
5. Integrated Electronics: Millman and Halkias
6. Linear Integrated Circuits: Choudhary and Jain.
7. Digital Electronics: Jain.