UNIT I: INTRODUCTION:
Introduction to control systems, Closed loop and open loop control systems. Effect of negative feedback. Mathematical modeling of physical systems. Transfer function of system components. Block diagram reduction. Signal flow graphs.

UNIT II: DIFFERENT TYPES OF CONTROL ACTION:
Different types of control actions like on-off, proportional, integral, derivatives etc. Time domain analysis of control system. Typical test signals. Impulse response functions. First order system, Second order and higher order systems.

UNIT III: ERROR ANALYSIS:

UNIT IV: FREQUENCY RESPONSE:
Introduction to frequency response approach. Bode plots of transfer functions, All-pass and minimum phase systems, Nyquist stability criterion, assessment of relative stability using Nyquist criterion, Closed loop frequency response.

UNIT V: TRANSFER FUNCTION:
State space representation of system, State diagrams, Transition matrix, Solution of time invariant and time varying state equations and Transfer function. Transfer matrix. Concept of controllability and observability.

Books recommended:
1. Control systems engineering- Nagrath & Gopal
2. Control systems - B.S. Manke.
UNIT-I: CRYSTAL STRUCTURE:

UNIT-II: LATTICE DYNAMICS AND THERMAL PROPERTIES:

UNIT-III: ELECTRONIC ENERGY BANDS:

UNIT-IV: ELEMENTS OF POLMER ELECTRONICS:
Conducting Polymer, home conduction. Electronic conduction, band theory, hopping conduction, organic molecular solids, conjugated chain, Radical-ion compound, organo metallic. Photoconduction, super conducting polymers, measurement of resistivity two point probe, four probe methods.

UNIT-V: OPTICAL PROPERTIES OF SOLIDS:

Books recommended:
1. Introduction of solid state physics: Kittel
2. Solids state Physics: Ashcroft and Mermin
3. An introduction to X-ray crystallography: Woolfson
4. Solid state physics: Azaroff
5. Intermediates quantum theory of crystalline solids: Aniámalu
7. Electrical properties of polymers: A.R. Blythe
UNIT-I: OPTICAL SENSORS:

UNIT-II: TRANSDUCERS:

UNIT-III: TRANSDUCER II:

UNIT-IV: OSCILLOSCOPE:

UNIT-V: MEASUREMENT OF BASIC PARAMETERS:

Books Recommended:
1. Electronic instrumentation and measurements techniques: W.D. Cooper & A.D. Heifric.
2. Understanding oscilloscope Sahny, Kulshreshtha, Gupta
3. Instrumentation devices and systems: Rangan, Sharma and Mani
UNIT-I: BINARY SYSTEMS:
Binary number system and other codes, Octal number system, Hexadecimal number system and conversion to decimal system, BCD system Binary arithmetic, Series and parallel processing of bits, Logic of the addition operation, Logic fundamentals, Boolean theorems, Synthesis of Boolean function, Karnaugh diagram. Logic circuits for addition. Binary arithmetic using 1's and 2's complements.

UNIT-II: LOGIC GATES:
Logic gates AND, OR, NOT, NAND and NOR gates, Logic gates and their operations using DTL, logic and TTL logic, Further coupled logic gates, CMOS inverter circuits, Design idea of logic circuits, Idea of logic gates using IC 7400 and 7408 based circuits.

UNIT-III: DIGITAL SYSTEM:
Binary adders, Half adders, Full adder, MSI adders, Serial operation, Arithmetic functions, Binary substraction, parity checker, Parity generator.

UNIT-IV: DIGITAL SWITCHING CIRCUITS:
Transistor a switch, Multivibrators, RS flip-flop, D flip-flop, T flip-flop, JK flip-flop, RS flip-flop, mono-stable, mono-stable multivibrator, astable multivibrator, Shift register, Counting, Decode matrix, Digital to analog conversion, Multiplexers and Demultiplexers.

UNIT-V: COUNTERS AND APPLICATION:
Ripple counters, up down counters, divide by N counters, synchronous counters, parallel carry, application of counters, dynamic MOS circuit two phase MOS, idea of MOS shift resistors & MOS ROM.

BOOKS RECOMMENDED:
1. Electronics fundamentals and application Mottershad
2. Integrated electronic: Millman & Halkias