

Contents :

1. Elementary Concepts of Material Science	p. 1
o Atomic structure	
o Quantum numbers	
o Crystal structure	
o Energy-band theory	
o Conductors, insulators, and semiconductors	
o Electronic properties of materials	
2. Conducting Materials	p. 24
o Electrical conductivity	
o Conducting metals and alloys	
o Contact materials	
o Resistance materials	
o Soldering materials	
3. Dielectric Behavior of Materials in Static Field	p. 47
o Dielectric polarization	
o Dielectric constant	
o Polar and non-polar dielectrics	
o Ferroelectric and piezoelectric materials	
4. Dielectric Behavior of Materials in Alternating Fields	p. 73
o Dielectric loss	
o Frequency dependence	
o Dielectric breakdown	
o Dielectric applications	
5. Magnetic Behavior of Materials	p. 91
o Diamagnetic materials	
o Paramagnetic materials	
o Ferromagnetic materials	
o Ferrites	
o Magnetic hysteresis	
o Magnetic properties and applications	
6. Super Conductors	p. 115
o Superconductivity	
o Critical temperature	
o Meissner effect	
o High-temperature superconductors	
7. Semiconducting Materials	p. 125
o Intrinsic semiconductors	
o Extrinsic semiconductors	
o N-type and P-type materials	
o Carrier transport	
o Semiconductor properties	
8. Discrete Passive Components Fabrication	p. 157
o Resistors	
o Capacitors	
o Inductors	
o Manufacturing processes	
o Component specifications	
9. Printed Circuit Board	p. 191

- PCB materials
- PCB fabrication techniques
- Photolithography
- Etching processes
- PCB assembly
- 10. **Surface Mount Devices** p. 204
 - Surface Mount Technology (SMT)
 - Surface Mount Devices (SMD)
 - Assembly techniques
 - Packaging and mounting methods

Bibliographic information