

**Third year of Five Years integrated M.Sc (Physics)
M.Sc. - III, Semester –V**

	L	T	P	C
MP 307 :				
Semiconductor Devices and applications	3	0	0	3

- **VARIOUS FET DEVICES : INTRODUCTION, CHARACTERISTICS AND APPLICATION** (10 Hours)
Types of FET, JFET, MODFET, SIT, MOSFET, Structure and principle of operation of MOSFET, MOSFET as an amplifier, MOSFET analysis, Threshold voltage. Power MOSFET, HEMT.
- **DIAC, TRIAC: INTRODUCTION, CHARACTERISTICS AND APPLICATION** (08 Hours)
Structure of DIAC, DIAC Principle of operation, Structure and principle of operation of TRIAC, Applications of TRIAC.
- **PNPN: INTRODUCTION, CHARACTERISTICS AND APPLICATION** (06 Hours)
The silicon-controlled rectifier, Device structure, Principle of operation, Equivalent circuit. Applications.
- **INTRODUCTION TO THE HETERO JUNCTIONS AND APPLICATIONS** (06 Hours)
Concept of Heterojunction, Multilayer Heterojunction, Energy band diagram for heterojunction, Confinement of charge carrier, Application of heterojunction.
- **PHOTONIC DEVICES: INTRODUCTION, CHARACTERISTICS AND APPLICATION** (06 Hours)
Light Emitting Diode (LED), Characteristics of LED, Materials and wavelength of light, Laser diode, Structure, Characteristics of laser diode, Photodiode and solar cell.
- **MICROWAVE DEVICES: INTRODUCTION, CHARACTERISTICS AND APPLICATION** (06 Hours)
MESFET, HEMT

(Total Contact Time (Theory) : 42 Hours)

BOOKS RECOMMENDED :

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|-------------------------------------|---|-------------------|------|
| 1. Schilling D.L. and Belove, C. | <i>Electronic Circuits : Discrete and Integrated</i> | McGraw Hill | 1989 |
| 2. Streetman, B. & Banerjee S. | <i>Solid State Electronic Devices,</i> | Prentice Hall | 2005 |
| 3. Boylestad R.L. and Nahselsky, L. | <i>Electronic Devices and Circuit Theory,</i> | Prentice Hall | 2005 |
| 4. Liao S.Y. | <i>Microwave Devices and Circuits</i> | Prentice Hall | 1996 |
| 5. Sze S.M. | <i>Semiconductor Devices : Physics and Technology</i> | John Wiley & Sons | 1986 |