B.Sc. Semester-I
Course code: PH-MJ 102

Total Credits: 04 (Theory: 3, Practical; 1)

Total Hrs: Theory: 45, Practical: 30

PH-MJ 102 (Theory)

Unit1	**Electrostatics I (Physics by Halliday,Resnik andKrane,Vol.2, 5th edition, Wiley)**
	Coulomb's law (25.4), what is a field? (26.1), the electric field (26.2), electric field of point charges (26.3), electric field of continuous charge distributions (26.4),electric field lines (26.5),a point charge in an electric field (26.6) What is Gauss' law al l about? (27.1), the flux of a vector field (27.2), the flux of the electric field (27.3), Gauss' law (27.4), applications of Gauss' law (27.5),Gauss' law and conductors (27.6) Potential energy (28.1), electric potential energy (28.2), electric potential (28.3),calculatingthepotentialfromthefield(28.4),potentialduetopointcharges(28.5),calculating the field from the potential (28.7), equi-potential surfaces (28.8),Electric current(31.1),electro motive force(31.2), analysis of circuits (31.3),RC circuits(31.7)
Unit2	**Diode circuits, Special purpose diodes and Bipolar Junction Transistors (Electronic principles by A. P.Malvino,6thEd., Tata Mc Graw-Hill Ltd.)**
	Diode circuits: The half-wave rectifier(4.1),the transformer(4.2),the full-wave rectifier (4.3),the bridge rectifier (4.4), the choke input filter (4.5), the capacitor input filter (4.6),clippers and limiters (4.10), clampers (4.11) **Special purpose diodes**: The zener diode (5.1), the loaded zener regulator(5.2) **Bipolar Junction Transistors:** The unbiased transistor (6.1),the biased transistor (6.2), transistor currents (6.3), the CE connection (6.4),the base curve(6.5), collector curves (6.6)
Unit3	**Optics (Optics byAjoy Ghatak,6thedition,McGraw-HillEducation)**
	Introduction(3.1),laws of reflection nd refraction from Fermat's principle (3.2),introduction (4.1), refraction at a single spherical surface (4.2), reflection by a single spherical surface (4.3), the thin lens (4.4), the principle foci and the focal length of a lens(4.5),the Newton's formula (4.6),lateral magnification (4.7), aplanatic points of a sphere(4.8)

Reference Books:

1. Elements of Electromagnetics by MNO Sadiku, Oxford UniversityPress,2001
2. Electricity and Magnetism by A S Mahajan and A R Rangwala 7thEd. Tata McGraw-Hill,2003.
3. University Physics by H D Young, R A Freedman and A Lewis Ford, 13th Ed. PearsonEducation,2013
4. Fundamentals of Optics by F Jenkins andHWhite4th Ed .McGraw Hill Education