Second year of Five Years integrated M.Sc. (Physics)

M.Sc. – II, Semester – III		**L**	**T**	**P**	**C**
MP 203 :	**Modern Physics & Physical Optics**	**3**	**1**	**2**	**5**

- **SPECIAL THEORY OF RELATIVITY** **(06 Hours)**
  Frames of reference, postulates of Sp. Theory of relativity, Time dilation, length contraction, Mass-energy interrelationship

- **BLACK BODY RADIATION** **(04 Hours)**
  Black body characteristics, Ultraviolet catastrophe, Laws of black body radiations

- **PARTICLE PROPERTIES OF WAVES** **(04 Hours)**
  Electromagnetic waves, light as a wave, dual nature, photoelectric effect, Compton effect, X-ray diffraction

- **WAVE PROPERTIES OF PARTICLES** **(04 Hours)**
  De-Broglie waves, Group and phase velocities, particle in abox, uncertainty principle

- **ATOMIC STRUCTURE** **(06 Hours)**
  The Nuclear Atom, Energy orbits, atomic spectra, The Bohr Atom, Energy levels, correspondence Principle, Pauli's exclusion principle, quantum numbers

- **INTRODUCTORY QUANTUM MECHANICS** **(06 Hours)**
  Classical mechanics as an approximation of quantum mechanics, Wave equation, Time dependent Schrodinger's eqn., Linearity and Superposition, Operators

- **PHYSICAL OPTICS** **(10 Hours)**
  Wave characteristics of light, Interference of light, Diffraction of light and Polarization of light

- **LASERS** **(04 Hours)**
  Basics of Lasers, their working, types and applications of lasers

(Total Contact Time (Theory): 44 Hours)

BOOKS RECOMMENDED :

1. **Beiser, A.,** *Concept of the Modern Physics*, TMH, 2008.
2. **Ghatak, A**., Optics, Tata McGraw Hill, 2005.
3. **Wehr M. R**, **Richards J.A. and Adair T. W**. , *Physics of the Atom*, Addison – Wesley, 1984.
4. **Harris,R.,** *Modern Physics*, Addison-Wesley/ Pearson), 2/E ,2007.
5. **Born M., and Wolf, E**., *Principles of Optics*, Cambridge Uni. Press,2000.