BS (4 Years) for Affiliated Colleges

Code	Subject Title	Cr. Hrs	Semester
PHY-423	**CLASSICAL ELECTRODYNAMICS-II**	**3**	**VIII**
Year	Discipline		
4	**Physics**		

Course Outlines:

Maxwell's Equations and their Applications: Green's function for time dependent wave equation, retarded scalar and vector potentials, radiation from an oscillating dipole, plane electromagnetic wave, plane waves in a conducting and non-conducting media, linear and circular polarization, and superposition of waves in one dimension, boundary conditions, reflection and refraction of electromagnetic waves at a plane interface between dielectrics, waves polarization by reflection and total internal reflection, reflection from a conducting medium, covariant formulation of electrodynamics, transformation laws of electromagnetic fields, the field of a uniformly moving and accelerated electron.

Plasma Physics: Introduction, electrical neutrality in a plasma, particle orbits and drift motion in a plasma, magnetic mirrors, the hydromagnetic equations, pinch effect, plasma oscillations and wave motion.

Lasers: Black body radiation, Induced emission and the gain coefficient, oscillations, output coupling, power and efficiency, optical resonators, fluctuation in lasers, solid state lasers, optical coupling, laser resonators, giant pulse techniques oscillators-amplifier lasers, power and energy supplies, high repetition rate laser, ruby laser, gas laser, semi-conductor diode laser, theory of p.n. junction laser, efficiency and thresh-hold current of diode lasers, applications of lasers.

Books Recommended:

1. *Classical Electrodynamics* by Jackson, Wiley, 1975.
2. *Electricity and Magnetism* by W. J. Duffin, McGraw-Hill, 1990.
3. *Electromagnetism* by I.S. Grant and W. R. Phillips Wiley, 1990.
4. *Introduction to Electrodynamics* by D. Griffiths Prentice Hall, 1989.