1.	Title of the course	Introduction to Electrodynamics and Quantum Mechanics
2.	Course number	PH102L
3.	Structure of credits	2-1-0-3
4.	Offered to	UG
5.	New course/modification to	Modification To PH1202/4
6.	To be offered by	Department of Physics
7.	To take effect from	January 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To provide an introduction to static and time varying electromagnetic phenomena in free space and matter using rigorous mathematical methods of vector calculus and their applications. To also introduce aspects of special theory of relativity and quantum mechanics.	
10.	**Course Content:** Electrostatic potentials and fields, superposition principle, discrete and continuous charge distributions, Gauss's law, Laplace and Poisson equation, electrostatic energy; Conductors and capacitors; Multipole expansions; Dielectrics, electric polarization and displacement fields; Boundary conditions; Magnetic fields, Biot-Savart's law, Ampere's law, magnetic energy; Magnetization, magnetic permeability, susceptibility; Lorentz force; Time-varying fields, Lenz-Faraday law, self and mutual inductance; Maxwell's equations in free space and in dielectric medium; Electromagnetic waves, electromagnetic energy density, Poynting vector; Symmetry in Maxwell's equations; Special theory of relativity, time-dilation, length-contraction, Lorentz transformations, twin-paradox, mass-energy equivalence; Inadequacy of classical mechanics, uncertainty principle, Schrodinger equation, simple applications.	
11.	**Textbook(s):** 1. Griffiths D J, *Introduction to Electrodynamics*, Pearson Education India Learning Private Limited (2015). 2. Kittel C, Knight W, Ruderman M, Helmholz C and Moyer B, Mechanics (Berkeley Physics Course), Vol. 1, McGraw Hill Education, (2011).	
12.	**Reference(s):** 1. Feynman R P, Leighton R B and Sands M, *Feynman Lectures in Physics*, Pearson Education (2012). 2. Powell J L and Crasemann B, *Quantum Mechanics*, Dover (2015).	