

1.	Title of the Course	Introduction to Electrodynamics and Quantum Mechanics
2.	Course Number	PH1202
3.	Status of the Course	Core
4.	Structure of Credits	2-1-0-3
5.	Offered To	UG
6.	New Course/Modification to	Modification To PH1202
7.	To be Offered by	Department of Physics
8.	To take effect from	January 2020
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	Course Objective: 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.	
12.	Course Content: Electrostatic potentials and fields, superposition principle, discrete and continuous charge distributions, Gauss' 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.	
13.	Text book(s): 1. Griffiths D J, <i>Introduction to Electrodynamics</i> , , Pearson Education India Learning Private Limited (2015). 2. Purcell E M and Morin D J, <i>Electricity and Magnetism</i> , Cambridge University Press (2013).	
14.	Reference(s): 1. Deshmukh P C, <i>Foundations of Classical Mechanics</i> , ,Cambridge University Press (2019). 2. Feynman R P, Leighton R B and Sands M, <i>Feynman Lectures in Physics</i> , Pearson Education (2012). 3. Powell J L and Crasemann B, <i>Quantum Mechanics</i> , Dover (2015).	