1.	Title of the Course	Quantum Mechanics II
2.	Course Number	PH5204
3.	Status of the Course	Core
4.	Structure of Credits	3-1-0-4
5.	Offered To	PG
6.	New Course/Modification to	New
7.	To be Offered by	Department of Physics
8.	To take effect from	July 2020
9.	Prerequisite	Nil
10.	Whether approved by the Department	Yes
11.	**Course Objective:** To introduce perturbative and variational methods for solving the Schrodinger equation and to discuss aspects of non-relativistic scattering theory and relativistic quantum mechanics.	
12.	**Course Content:** Approximation methods: time independent and dependent perturbation theory, application to Stark and Zeeman effects, Rayleigh-Ritz variational principle, Wentzel-Kramers-Brillouin approximation; Non-relativistic scattering theory: Lippmann-Schwinger equation, Born approximation, the optical theorem, reciprocity theorem, partial wave analysis, Levinson's theorem; Relativistic quantum mechanics: Klein-Gordon equation, Dirac equation, Dirac matrices, spinors, positive and negative energy solutions, physical interpretation, perturbative analysis of relativistic effects.	
13.	**Text book(s):** 1. Bjorken J D and Drell S D, *Relativistic Quantum Mechanics*, McGraw Hill Education (2013). 2. Sakurai J J , *Modern Quantum Mechanics*, Pearson Education India (2013).	
14.	**Reference(s):** 1. Brandsen B H and Joachain C J, *Physics of Atoms and Molecules*, Prentice Hall (2003). 2. Cohen-Tannoudji C, Diu B and Laloe F, *Quantum Mechanics*, Wiley-VCH (1992). 3. Landau L D and Lifshitz E M, *Quantum Mechanics: Non-Relativistic Theory*, Elsevier India (2004). 4. Schiff L I, *Quantum Mechanics*, McGraw Hill Education (2017).	