1.	Title of the course	Quantum Mechanics I
2.	Course number	PH510L
3.	Structure of credits	3-1-0-4
4.	Offered to	PG
5.	New course/modification to	Modification To PH5107/10
6.	To be offered by	Department of Physics
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To introduce foundational aspects and the basic mathematical framework of quantum mechanics and to discuss the characteristics of simple quantum systems.	
10.	**Course Content:** Uncertainty principle, wave particle duality; Mathematical framework: State vectors and operators in Hilbert space, expectation values; Schrodinger equation, wavefunction and its interpretation; Time evolution in the Schrodinger, Heisenberg and Dirac pictures; Simple quantum systems: 1D potential wells/barriers, tunnelling, linear harmonic oscillator; Central force and angular momentum operator, addition of angular momenta; Symmetries and invariance; Hydrogen atom and SO(3) symmetry; Spin 1/2 systems and SU(2) symmetry; Feynman Path Integrals; Other foundational aspects: measurement, entanglement, EPR paradox and Bell's inequalities, locality problem.	
11.	**Textbook(s):** 1. Sakurai J J, *Modern Quantum Mechanics*, Pearson Education India (2013). 2. Shankar R, *Principles of Quantum Mechanics*, Springer India (2010).	
12.	**Reference(s):** 1. Cohen-Tannoudji C, Diu B and Laloe F, *Quantum Mechanics*, Wiley-VCH (1992). 2. Dirac P A M, *The Principles of Quantum Mechanics*, Clarendon Press (1981). 3. Landau L D and Lifshitz E M, *Quantum Mechanics: Non-Relativistic Theory*, Elsevier India (2004). 4. Zettili N, *Quantum Mechanics: Concepts and Applications*, Wiley (2009).	