Semester	AUG 2022
Open to semester	3
Course code	**PH2113**
Course title	**Introductory Quantum Physics**
Credits	3 /
Course Coordinator & participating faculty (if any)	Bhas Bapat
Nature of Course	Lectures and Tutorials
Pre-requisites	NIL
Objectives (goals, type of students for whom useful, outcome etc)	Motivate the need for quantum mechanics by bringing out the inadequacies of classical mechanics. Introduce the concepts of wave particle duality and the uncertainty principle. Important course for all science graduates as quantum mechanics forms the foundation of much of physics, chemistry and biology.
Course contents (details of topics /sections with no. of lectures for each)	An outline of topics and approximate number of lectures is shown below. This may change somewhat. There will be approximately 14 lectures each before and after the mid-sem exam. Inadequacies of Classical Mechanics -- theoretical arguments and conflicts between expectations and experimental observations. (4L) The dawn of quantum ideas -- Studies concerning black-body radiation, photoelectric effect, Compton Effect, atomic spectra and structure, wave particle duality. Planck's postulate and its implications. Bohr's theory, the Correspondence Principle and shortcomings of the old quantum theory. (5L) Wave mechanics: de Broglie hypothesis, Heisenberg's uncertainty principle. Schrödinger equation, interpretation of the wavefunction. (5L) Postulates of quantum mechanics, operators and observables, expectation values.

	(4L) Eigenstates and Eigenvalues, basis sets. Matrix formulation (4L) Solutions of the Schrödinger equation for a few special (model) cases and their applications to real situations. (6L)
Evaluation /assessment	End-Sem Examination-40% Mid-Sem Examination-30% Others-There will be two graded quizzes, one in each half of the semester and a few ungraded home assignments.%
Suggested readings (with full list of authors, publisher, year, edn etc.)	There are plenty of introductory books on Quantum Mechanics. The last one is relatively new and more formally written and is at a higher level. 1. Quantum Physics by Wichman, Berkeley Physics Course 2. Quantum Physics by Eisberg and Resnick, John Wiley and Sons 3. Elements of Modern Physics by S H Patil, Ane's Student Edition (Revised 2016) 4. Introduction to Modern Physics by Richtmeyer, Kennard and Cooper, McGraw Hill, 4th Ed. [a simply written, but old book] 5. Quantum Mechanics by Cohen-Tannoudji, Diu and Laloe, Vol.-i, Wiley, 2nd-ed.