

INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
PROFORMA FOR NEW COURSE

1.	Title of the Course	Quantum Mechanics I
2.	Course Number	ID5102
3.	Status of the Course	Core
4.	Structure of Credits	3 – 0 – 0 – 3
5.	Offered to	PG
6.	New Course/ Modification to	New
7.	To be offered by	Faculties from Departments of Physics and Chemistry
8.	To take effect from	January 2018
9.	Prerequisite	Nil
10.	Whether approved by the Program	Yes
11.	Course Objective: To provide the introduction to quantum mechanics to post-graduate/PhD students of Physics and Chemistry.	
12.	<p>Course Content:</p> <p>Inadequacy of Classical Mechanics. Generalized Uncertainty Principle. Schrodinger Equation.</p> <p>Schrodinger, Heisenberg and Dirac Pictures of Quantum Evolution of State of a System.</p> <p>Angular Momentum in Quantum Mechanics. Clebsch-Gordan coefficients. Addition Theorem of Spherical Harmonics. Wigner-Eckart Theorem.</p> <p>Linear Harmonic Oscillator and the Hydrogen atom in Quantum Mechanics. Symmetry and Degeneracy. Time-Independent and Time-Dependent Perturbation Theory. Applications in Stark and Zeeman Spectroscopies, and in Radiative Phenomena. Fermi's Golden Rule.</p> <p>Time Reversal Symmetry. Inter-relationship between Collision Physics and Spectroscopy.</p>	
13.	<p>Text Book:</p> <ol style="list-style-type: none"> 1. C. Cohen-Tannoudji, B. Diu and F. Laloe, <i>Quantum Mechanics</i>, Vol. 1 and 2, Wiley-Interscience (1977). 2. J. J. Sakurai, <i>Modern Quantum Mechanics</i>, 2nd Edition (2014). 	
14.	<p>References:</p> <ol style="list-style-type: none"> 1. R. P. Feynman, R. B. Leighton and M. Sands, <i>The Feynman Lectures on Physics</i>, Vol. 3, Narosa Pub. House (1992). 	