Introductory Quantum Chemistry - Video course

COURSE OUTLINE

The course will introduce quantum mechanics as applied to chemistry and would be structured such that B.Sc. students can follow, provided they have familiarity with differential equations.

COURSE DETAIL

Module No.	Topic/s	Lectures
1	**Introduction to Quantum Mechanics:** wave particle duality, uncertainty principle, standing waves, stationary states, atomic orbitals, path integrals and random walks.	5
2	Postulates of Quantum Mechanics	3
3	Particle in a box, particle in a box of finite depth	3
4	The free particle, and the derivation of the uncertainty principle	3
5	Particle encountering a barrier, tunnelling. Tunnelling in chemistry	2
6	Particle in a ring	1
7	The Harmonic Oscillator	4
8	Particle on a sphere	3
9	The Hydrogen Atom	6
10	The variation and perturbation method	4
11	Time depedent problems	4
12	Hydrogen Molecule ion, Born Oppenheimer approximation, LCAOMO method	4

References:

NPTEL

http://nptel.iitm.ac.in

Chemistry and Biochemistry

Pre-requisites:

Familiarity with differential equations

Hyperlinks:

Educational Videos on Youtube

Coordinators:

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1. Pauling and Wilson, Introduction to Quantum Mechnics, Dover Edition
2. Schwabl, Quantum Mechanics, Springer Books
3. P.M. Mathews and Venkatesan, Quantum Mechanics, Tata McGraw Hill