

Department of Chemistry  
Indian Institute of Technology Kanpur  
Session 2017-2018, Semester – I

**CHM 321A/421A**  
**Physical Chemistry – I**

**Lectures: MWF 10:00 – 11:00 am L14**

**Instructor: Dr. Pratik Sen**  
**Office: OldCoreLab 101B**  
**Tel: 6312**  
**Email: [psen@iitk.ac.in](mailto:psen@iitk.ac.in)**

**Course Details:**

- Introduction: importance, historic background, quantum mechanics vs classical mechanics, wave particle duality, uncertainty principle
- Schrödinger equation: wave function and interpretation, time dependent and time independent Schrödinger equation, eigen value problem
- Quantum mechanics of some simple systems: free particle, particle in a box, harmonic oscillator
- Angular Momentum: rigid rotor, orbital and spin angular momentum
- Hydrogen and hydrogen like atoms
- Approximate methods: perturbation theory, variation method, some simple examples.
- Many electron atom: Pauli anti symmetry principle, Slater determinant, He atom, Li atom.

**Text Book:**

- N. Levine, Quantum Chemistry

**Grading System:**

- Quiz: 10% + 10%
- MSE: 30%
- ESE: 50%

**Letter Grade:**

- Awarded based on the total marks out of 100.