EC(MS)574 Physics of Semiconductor Materials

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Class Syllabus

⇒ **Part I − Quantum Mechanics**

- Quantum mechanical description of a physical system, operators and physical observables, properties of operators, operator and linear vector spaces.

- Solution of one-dimensional problems.

- Angular momentum, solution of two- and three-dimensional problems, hydrogen atom, concept of spin.

- Multi-electron systems.

- Approximate solutions for time-independent problems, degenerate and non degenerate perturbation.

- Approximate solutions for time-dependent problems, Fermi's golden rule.

⇒ **Part II. − Applications**

- Semiconductor quantum wires, dots and impurities in semiconductors.

- Solution of periodic potential problems, application to the calculation of the band structures of semiconductors.

- Electron motion in solids.