Code	Subject Title	Cr. Hrs	Semester
MATH-409	**Quantum Mechanics-I**	**3**	**VII**
Year	Discipline		
4	**Mathematics**		

Objectives:

Inadequacy of Classical Mechanics

- Black body radiation
- Photoelectric effect
- Compton effect
- Bohr's theory of atomic structure
- Wave-particle duality
- The de Broglie postulate
- Heisenberg uncertainty principle

The Postulates of Quantum Mechanics: Operators, Eigenfunctions and Eigenvalues

- Observables and operators
- Measurement in quantum mechanics
- The state function and expectation values
- Time development of the state f unction (Schrödinger wave equation)
- Solution to the initial-value problem in quantum mechanics
- Parity operators

Preparatory Concepts: Function Spaces and Hermitian Operators

- Particle in a box
- Dirac notation
- Hilbert space
- Hermitian operators
- Properties of Hermitian operators

Additional One-Dimensional Problems: Bound and Unbound States

- General properties of the 1-di mensional Schrodinger equation
- Unbound states
- One-dimensional barrier problems
- The rectangular barrier: Tunneling

Recommended Books:

- H. D. Dehmen, the Picture Book of Quantum Mechanics (Springer, 2001).
- H. F. Hameka, Quantum Mechanics: A Conceptual Approach (Wiley-IEEE, 2004).
- R. L. Liboff, Introductory Quantum Mechanics (Addison-Wesley Publishing Co., 2003).
- V. K. Thankappan, Quantum Mechanics (New Age Publishers, 1993).
- D. R. Bès, Quantum Mechanics: A Modern and Concise Introductory Course (Springer, 2004).