Code	Subject Title	Cr. Hrs	Semester
MATH-425	**Quantum Mechanics - II**	**3**	**VIII**
Year	Discipline		
4	**Mathematics**		

Objectives:

Harmonic Oscillator and Problems in Three-Dimensions

- The harmonic oscillator
- Eigenfunctions of the harmonic oscillator
- The harmonic oscillator in momentum space
- Motion in three dimensions
- Spherically symmetric pote ntial and the hydrogen atom

Angular Momentum

- Basic properties
- Eigenvalues of the angular momentum operators
- Eigenfunctions of the orbital angular momentum operators L2 and Lz
- Commutation relations between components of angular momentum and their representation in spherical polar coordinates

Scattering Theory

- The scattering cross-section
- Scattering amplitude
- Scattering equation
- Born approximation
- Partial wave analysis

Perturbation Theory

- Time independent perturbation of no n-degenerate and degenerate cases
- Time-dependent perturbations

Recommended Books:

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