

School of Mathematics**Course 441 — Quantum Mechanics**

2004-05

(JS Theoretical Physics, optional JS & SS Mathematics)

Lecturer: Dr. M.P. Fry**Requirements/prerequisites:** 241**Duration:** 21 weeks.**Number of lectures per week:** 3**Assessment:** Weekly problems**End-of-year Examination:** One 3-hour examination

Description: The course begins with a survey of the foundations of quantum mechanics, using Dirac notation. It then proceeds to illustrative solutions of Schrödinger's equation, including bound-state problems, periodic potentials and scattering theory. This is followed by a study of symmetries, including displacements in time, spatial translations, rotations and angular momentum, reflections in space, and time reversal. Following this, stationary state and time-dependent perturbation theory are developed. Time permitting, Feynman's path-integral formulation of quantum mechanics will be discussed.

Objectives: The course aims to present the principles of quantum mechanics and to apply them to the physical world with the aid of weekly problem sets.

Textbooks: E. Merzbacher, *Quantum Mechanics 3rd Edition*, recommended among others.

June 28, 2004