

**School of Mathematics****Course 141 — Mechanics 1**

2006-07

(JF Mathematics, JF Theoretical Physics &amp; SF Two-subject Moderatorship )

**Lecturer:** M.P. Fry**Requirements/prerequisites:** None**Duration:** 24 weeks**Number of lectures per week:** 3**Assessment:** Weekly assignments counting 25%**End-of-year Examination:** One 3-hour exam**Description:**

The following topics are covered: vectors, Newton's laws, conservation of momentum, Newtonian gravity, inertial and accelerated reference frames, Galilean transformations, motion of charged particles in electric and magnetic fields, conservative forces, conservation of energy, two-particle dynamics, conservation of angular momentum, rigid body dynamics, two-body central force problem, including scattering. Students are encouraged to study nonlinear dynamics, chaos and celestial dynamics using computers.

**Objectives:** This course aims to present the principles of elementary classical mechanics. It also seeks to introduce at an early stage the methods of scientific reasoning and research.

**Textbooks:** D. Kleppner and R. Kolenkow, *An Introduction to Mechanics*.

March 26, 2007