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# Fordham University

## PYRU 2001: Theoretical Mechanics

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Spring 2008

**Lectures:** Mon. 2:30-3:45 pm., Thurs. 2:30 – 3:45 am,  
Tue. 11:30 am– 12:20 pm  
**Classroom:** Room 101, Freeman Hall

**Instructor:** Kunal Das  
**Office:** 210 Freeman Hall  
**Phone:** 817-4181 or 817-4182  
**Email:** kdas@fordham.edu

**Office Hours:** Tue. 2:00 – 4:00 p.m., Thurs. 12:00 – 2:00 p.m.  
or walk in any time I am in my office

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**Scope of the Course:** The course is an intermediate course in mechanics designed to present students of physics and engineering with a sophisticated and detailed study of the principles of classical Newtonian mechanics and their applications. The course will be based on the Newtonian formulation of mechanics, meaning that Hamiltonian and Lagrangian approach will not be considered. A knowledge of introductory integral and differential calculus will be assumed. The mathematics programming software *Mathematica* will be introduced and used to solve problems related to the material in this course.

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**Textbook:**

Primary: *Analytical Mechanics* 7<sup>th</sup> ed., G. R. Fowles and G. L. Cassidy  
(Thomson Brooks/Cole)

Supplemental: *Mathematica for Students* (Software) Wolfram Research

**Grading:**

Homework:	10%
Quizzes:	15%
Midterm – I:	20%
Midterm – II:	20%
Numerical Computation	10%
Final:	25%

Homework problem sets will be assigned regularly during the semester. A random selection of problems from each set will be graded. Late homework will not be accepted. Quizzes will be based primarily on homework problems.

## Course Outline

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- Properties of Vectors (Chap 1)
- Rectilinear Motion of a Particle (Chap 2)
- Oscillations (Chap 3)
- Motion of a Particle in 3D (Chap 4)
- Noninertial Systems (Chap 5)
- Gravitation and Central Forces (Chap 6)
- Dynamics of a System of Particles (Chap 7)
- Mechanics of Rigid Bodies (Chap 8)

**Mathematica:** Basic commands and usage for simple mathematical problems will be covered initially, followed by applications to selected problems from the material covered in the course.