



UP 101 August 2:1

Introductory Mechanics

Instructor

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Teaching Assistant

Email:

Department: Physics, Undergraduate Programme

Course Time: 8:30 AM - 9:30 AM

Lecture venue: Undergraduate Lecture Hall

Detailed Course Page: <https://piazza.com/class/j5ou5nnxbv478o>

Announcements

Brief description of the course

Introductory physics course for first year undergraduates with a high school physics background. The course entails learning elementary concepts of mechanics in class along with related experiments in the laboratory

Prerequisites

High school physics

Syllabus

Dimensional analysis; Standard Units; Vectors; Polar coordinates; Newton's laws of motion; Force, momentum and energy, Collisions and centre of mass motion; Conservation laws; The work-energy theorem; Conservative and non-conservative forces; Potential and the force as the gradient of a potential; Stokes' theorem for conservative forces; Gravitational potential and projectile motion; Rotational motion; Angular momentum, torque and moment of inertia; Conservation laws in rotational motion; Rigid body motion and elementary ideas about precession and the tensor of inertia; Central force motion and Kepler's laws; Hooke's law and the simple harmonic oscillator; Damped and forced harmonic oscillators; Resonance and Q factor; Coupled oscillators and normal modes; Periodic motion and Fourier analysis; Waves in a collection of masses

and springs

Course outcomes

Basic concepts in mechanics and their applications in solving problems and explaining observable phenomena as seen in laboratory experiments.

Grading policy

34% Lab

33% Final Exam

20% Midterm Exam

13% Quizzes

Assignments

Resources