JNCASR

Integrated PhD (Physical Sciences) Semester I

JTL 217: Classical Mechanics

LECTURES

Dimensional Analysis. Statics. Coordinate transformations.

Newton's laws, oscillations, energy, momentum, angular momentum, planetary motion, Collisions, and special relativity.

The Lagrangian Method: The Euler Lagrange equations, the principle of stationary action, Constraints, Conservation Laws, Noether's theorem.

Hamiltonian Mechanics. (Section titles: Energy, Hamilton's equations, Legendre transforms, Three more derivations, Phase space and Liouville's theorem.

Advanced topics will include normal modes, waves, gyroscopic motion, fictitious forces, Continuum Mechanics, 4-vectors, and general relativity.

Applications in Solid State Physics.

TEXTS

1. Classical Mechanics by Goldstein, H., Pool C. & Fafko J.
2. Introduction to Mechanics by Morin D.

ASSESSMENT

- *Problem Sets:*
  There will be 5 problem sets and the answer scripts should be submitted within the specified time.This portion will account for 40% of the grade.
- *Mid term and Final Exam:* This will account for 60% of the grade

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