IISER Pune - Course Content

Semester	JAN 2024
Open to Semester	4
Course Code	PH2213
Course title	Classical mechanics * (E)
Nature of Course	LT - lecture and Tutorial
Credit	3
Coordinator and participating faculty (if any)	**Dr. Arijit Bhattacharyay**
Pre-requisites	None
Objectives	In this course you will learn classical mechanics using the methods of Lagrangian and Hamilton*s equations. This course would show you how to generalize the Newtonian Mechanics that you have done so far.
Course content	So far, you have been doing Newton’s mechanics where you identify the forces, write down the equations of motions and solve them to understand the dynamics of a system. However, this process becomes complicated and cumbersome for systems with lots of constraints in general. In this course we will discuss two elegant functions (Lagrangian and Hamiltonian) using which you can, in general, circumvent the difficulties in writing equations of motion of Newtonian mechanics. We will study two classes of motion: (a) oscillations of a system about equilibrium positions and (b) motion of two bodies under the influence of mutual central force (closed system). We will learn about action principle, conservation laws and symmetries, inertial frames and also non-inertial (rotating) frames, Hamilton-Jacobi theory. This is a foundational course and the approach would be formal.
Evaluation / Assessment	End Sem - 35% Mid Sem - 35% Quiz I (before mid sem) - 15% Quiz II (after mid sem) - 15%
Suggested readings	1. Mechanics by Landau and Lifshitz (main text book) 2. Classical Mechanics: A course of Lectures by Raychaudhuri A. K. 3. Classical Mechanics by Rana and Joag
When Next	It gets offered every year in the January semester
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