PHYS 413

Description

An integrated approach to classical and statistical mechanics. Lagrangian and Hamiltonian formulations, conservation laws, kinematics and dynamics, Poisson brackets, continuous media, derivation of laws of thermodynamics, the development of the partition function. To be followed by PHYS 414.

Syllabus

First 10 weeks
Lagrange and hamiltonian formulations
variational calculus
conservation laws and symmetries
two body orbital problem
scattering
kinematics and dynamics
small oscillations
canonical transformation and H|milton-lacoby theory
Poisson brackets
introduction to mechanics of continuous media

Last 5 weeks
Introduction to statistical thermodynamics
Gibbs method
development of the partition function
microcanical, canonical, and grand canonical ensembles
chemical potential
connection between atomic and macroscopic properties of matter