理論力學(一、二) – 10210PHYS221000

Theoretical Mechanics (I & II) – Fall, 2013 & Spring, 2014

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課程綱要:

This course focuses on the subject of Classical Mechanics which has been developed over hundreds of years since Isaac Newton. In this course, you are expected to master the ideas behind **Newtonian Mechanics**, **Calculus of Variations** (and variational approach with constraints), **Virtual Work**, **Lagrangian Mechanics**, **Canonical Equations** (Hamiltonian Mechanics), **Conservation Laws**, etc. And apply the above-mentioned physics to fully understand classical examples of oscillations, central forces, collisions between particles, motion of a rigid body, and all interesting phenomena in classical regime. We will also cover fundamental concepts of **Nonlinear Dynamics** and **Chaos** if we have time. This course is aimed to shorten the gap between undergraduate and graduate physics training.

Main materials for the Spring semester – **Special Relativity**, **Nonlinear Dynamics**, **Motion of Rigid Body**, **Continuum Mechanics**, and more.

上課時間(**M3M4W2**)、教室(**物理館 019**):

The class is held every Monday from 10:10AM to 12:00PM and every Wednesday from 9:00AM to 9:50AM in **Room 019** in Physics Building.

課程用書: **筆記為主**

參考書目:

1. "Analytical Mechanics" by *L. N. Hand* and *J. D. Finch*
2. "Mechanics" by *L. D. Landau* and *M. Lifshitz*
3. "Classical Mechanics" by H. *Goldstein*
4. "Classical Dynamics of Particles and Systems" by *S. T. Thornton* and *J. B. Marion*
5. "Nonlinear Dynamics and Chaos" by *S. H. Strogatz*

評分標準:

The course grade will be composed of

- Homework Sets (30%). Collaboration on homework set is encouraged, however each student must write up his or her own reasoning independently.
- Exams: midterm (35%) and final (35%).

助教 – TBD

Updated on 1/13/2014