

# 理論力學(一、二) – 10510PHYS221000

## Theoretical Mechanics (I & II)

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### 課程大綱：

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.

上課時間：M3M4W2 (週一 10:10 – 12:00、週三 9:00 – 9:50)、教室：物理館 019

課程用書：筆記為主

### 參考書目：

1. “**Analytical Mechanics**” by *L. N. Hand* and *J. D. Finch* (課程編排參考此書)
2. “**Mechanics**” by *L. D. Landau* and *M. Lifshitz*
3. “**Classical Dynamics of Particles and Systems**” by *S. T. Thornton* and *J. B. Marion*
4. “**Nonlinear Dynamics and Chaos**” by *S. H. Strogatz*

Office Hour & 演習課: To be announced.

### 評分方式：

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: To be announced

**Note: This syllabus will be slightly modified at a later time in the summer!**