

**Physics 606**  
**<< Classical Mechanics >>**

Fall 2016

Instructor: Dr. Y. H. Shih

Office: PHYS 310

Telephone: 2558 (o), 2796 (Lab.)

Lectures: Tu Th 10:00-11:15 am

Room: PHYS 107

Text: Marion and Thornton <<Classical Dynamics>>

References: H. Goldstein <<Classical Mechanics>>

Landau & Lifshitz <<Mechanics>>

T.L. Chow <<Classical Mechanics>>

Prerequisites: Student should have had a standard undergraduate course in intermediate mechanics and a standard undergraduate course in mathematical physics or engineering mathematics. In particular, it will be assumed that the students understand the basic theory of ordinary differential equation and basic material about vector spaces and matrices.

Homework: Homework due day will be noticed with the assignment. You are encouraged to discuss the problems together; however, each person should work out their assignment *independently*. Assignments are to be written up professionally with computer graphics where appropriate. The computer worksheets should be readable by anyone. This requires explanations of what you are doing.

Grading Method: Homework 20%, Midterm 30%, Final 50%.

Office Hours: W 12:30-3:30pm. I am usually in my Lab. (Rooms 010, 011) and happy to speak with you any time. Call me before your visit.

Topic Outline:

- I. Newtonian mechanics and simple mechanical systems
- II. Hamilton's principle–Lagrangian and Hamiltonian dynamics
- III. Central-force motion
- IV. Dynamics of a system of particles
- V. Motion in a noninertial reference frame
- VI. Dynamics of rigid bodies
- VII. Linear oscillation and coupled linear oscillations
- VIII. Hamilton dynamics, canonical transformation, Poisson brackets and phase space.
- IX. Mechanical waves and wave equation