

PHYS 401 – 501 SYLLABUS

Introduction:

This is the syllabus for PHYS401/501 Classical Mechanics. It is a double coded class, given to undergraduates and graduates with the same material. The study questions and midterms may be different based on the level of class. The grading and the rest is the same.

I will use SUCOURSE extensively for study assignment/collection, announcement, sharing resources, etc.

I will use TOPHAT to ask questions. Join code: 043217

Tuesday 09:40 – 10:30, FASS1081

Wednesday 09:40 – 11:30 FASS 1081

Contents:

- 0 introduction to class
- 1. Equations of motion
 - Lagrangian
- 2. Conservation laws
 - Energy
 - Momentum
 - Angular momentum
- 3. Integration of equation of motion
 - One dimension
 - Reduced mass
 - Central field
 - Kepler
- 3.5 Motion in non-inertial frames
- 4. Collisions
 - Elastic
 - Scattering
 - Rutherford
 - Small angle
- 5. small oscillations
 - Free
 - Forced
 - Vibrations
 - Damped
 - Friction
 - Resonance
 - Non-linear (PHYS 501 only)
- 6. rigid body
 - Motion
 - Eulerian angles
 - Symmetric top
- 7. canonical eqns. (PHYS 501 only)
 - Hamiltons principle
 - Poisson brackets
 - Canonical trans
 - Liouville
 - Hamilton jacobi

Grading:

final = 45 pts

midterm=30 pts

Homeworks=20 pts

Tophat participation = 15 pts

Books:

Landau Lifshitz – Mechanics (main book)

Goldstein – Classical Mechanics

Marion – Classical Dynamics of Particles and Systems

Fetter and Walecka – Theoretical Mechanics of particles and continua

Times, places, days, and SUCOURSE INFORMATION

If we can find a better day and time, these could change, but do not bet on it. I will take attendance, as per YOK regulations, but I will also honor registration override requests. You are on your own if you fail to attend the classes.