PHYSICS 303: Advanced Mechanics. Spring 2013

Class time: Tuesday and Thursday 11:10-12:25, room MPHY 213

Mid-term exam 1: Wednesday, February 20, 7:30-9:30 p.m.
Mid-term exam 2: Monday, March 25, 7:30-9:30 p.m.
Final exam: Friday, May 3, 3:00-5:00 p.m.

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Office hours: TTR 10:00 am – 11:00 am or any time when I am in the office


Additional recommended text: L.D. Landau and E.M. Lifshitz, Mechanics, 3rd edition

Additional materials will be handed out in class as supplement and posted.

Prerequisites and Co-requisites: PHYS 302, calculus, and differential equations

Tentative schedule and topics to be covered in the spring semester:

Weeks 1-2: Rotation of rigid bodies. Taylor Ch. 10, Landau Ch. 6.

Weeks 3-5: Oscillations and normal modes. Taylor Ch. 5 & 11, Landau Ch. 5.

Weeks 6-11: Hamiltonian mechanics. Taylor Ch. 13, Landau Ch. 7.
   - Hamilton’s equations
   - Phase space
   - Poisson brackets
   - Action. Variational principle
   - Canonical transformations
   - Liouville’s theorem
   - The Hamilton-Jacobi equation
   - Action-angle variables
   - Adiabatic invariants

Weeks 12-14: Additional topics: chaos, continuum mechanics. Taylor, Ch. 12 & 16.
Policy and grading:
- Attendance is required. Your active participation in class discussion is encouraged.
- Homework assignments will be distributed each week. You can discuss the homework problems among yourselves, but the write up must be your own.
- There will be two mid-term exams and the final exam. Note that mid-terms will be held at 7:30-9:30 pm in the evenings.
- Grading: 20% homework, 25% each mid-term exam, 30% final exam

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room B118 of Cain Hall, or call 979-845-1637.

Aggie Honor Code

“An Aggie does not lie, cheat, or steal or tolerate those who do.” (See the Honor Council Rules and Procedures on the web at http://www.tamu.edu/aggiehonor.)