Advanced Mechanics. Spring 2015

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Text: This book is required.
    This book is recommended.
  • L.D. Landau and E.M. Lifshitz, Mechanics, 3rd edition

Grading:

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<td>1 exam</td>
<td>40%</td>
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<td>Final (comprehensive)</td>
<td>40%</td>
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<td>Homework (weekly)</td>
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Evening exams on Thursday, March 26, 7:00-9:00pm; MPHY 205
Final exam: May 7, Thursday, 3-5 pm; MPHY 213

Prerequisites and Co-requisites: freshman mechanics, e.g. PHYS 218 or equivalent, calculus, and differential equations

Syllabus:
Block 1: Particle collisions and scattering. Rutherford's formula

Block 2: Rotation of rigid bodies. Taylor Ch. 10, Landau Ch. 6.

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

Block 4: Applications of Hamiltonian mechanics.
  Action. Variational principle
  Liouville's theorem
  The Hamilton-Jacobi equation
  Action-angle variables
  Adiabatic invariants

Block 5: Hydrodynamics.

Block 6: Elasticity theory.
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