Advanced Mechanics. Spring 2015

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Office Hours: TR 3:00-4:00
Office phone: 1-404-981-7799 (via Google voice)
Text: Book for the course.
  • 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>
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<td>Homework (weekly)</td>
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Exam on Thursday, March 24, 5:30-6:45pm; MPHY 213
Final exam: May 10, Tuesday, 3:30-5:30 pm; MPHY 213

Prerequisites and Co-requisites: Calculus, and differential equations

Syllabus:
Block 1: Oscillations, Resonance.
Block 2: 1D motion, 2D motion, Kepler's laws, Particle collisions and scattering. Rutherford's formula
Block 3: Lagrangian Mechanics.
Block 4: Hamiltonian Mechanics.
Block 5: Oscillations: normal modes, Kapitza pendulum, Foucault pendulum, Parametric resonance, Phonons.
Block 6: Rotation of rigid bodies.
Block 7: Applications of Hamiltonian mechanics, Action. Variational principle, Liouville’s theorem, The Hamilton-Jacobi equation, Action-angle variables, Adiabatic invariants

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