

Advanced Mechanics. Spring 2015**Instructor:** Artem G. Abanov**Web page:** <http://faculty.physics.tamu.edu/abanov/>**email :** abanov@tamu.edu**Office:** MPHY 415**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:

1 exam	40%
Final (comprehensive)	40%
Homework (weekly)	20%

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 . Ruserford's formulaBlock 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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