

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 10:00-11:00

Office phone: 1-404-981-7799 (via Google voice)

Text: This book is required.

- **John R. Taylor, Classical Mechanics, University Science Books, ISBN-10: 189138922X | ISBN-13: 978-1891389221, Publication Date: 2005.**

This book is recommended.

- L.D. Landau and E.M. Lifshitz, Mechanics, 3rd edition

Grading:

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

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.

Americans with Disabilities Act (ADA) Policy Statement: 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 Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>.

Academic Integrity Statement: “An Aggie does not lie, cheat, or steal or tolerate those who do.” The Honor Council Rules and Procedures may be found on the web at <http://www.tamu.edu/aggiehonor>.