Physics 310 (Mechanics) Spring 2010 Lewis Hall 228 T Th 9:30-10:45
Text: Analytical Mechanics, Fowles & Cassidy, 7th edition 915-7032
Instructor: Dr. Don Summers Lewis Hall Rm 221 Office Hours: TThF 4-5

Date	Subject	Read Before Class
21 Jan	Introduction	
26 Jan	Vectors: Derivatives. Cylindrical & Spherical Coordinates	Chap 1
28 Jan	Newtonian Mechanics and Rectilinear Motion	Chap 2
2 Feb	Kinetic and Potential Energy, Terminal Velocity	Chap 2
4 Feb	Oscillations	Chap 3
9 Feb	Damped and Driven Harmonic Oscillations	Chap 3
11 Feb	FIRST EXAM	
16 Feb	Air Resistance, Range, 3D Harmonic Oscillator	Chap 4
18 Feb	Charged Particle Motion in Electric and Magnetic Fields	Chap 4
23 Feb	Constrained Motion of a Particle	Chap 4
25 Feb	Noninertial Reference Frames	Chap 5
2 Mar	Rotating Reference Frames	Chap 5
4 Mar	Earth's Rotation, Foucault Pendulum	Chap 5
9 Mar	Gravity, Central Forces, and Spheres, Potential Energy	Chap 6
11 Mar	Kepler's 3 Laws of Planetary Motion, Deriving 3rd Law	Chap 6
23 Mar	Radial Oscillations, Mercury Precession, Alpha Particles	Chap 6
25 Mar	SECOND EXAM	
30 Mar	Dynamics of Systems of Particles, Angular Momentum, KE	Chap 7
1 Apr	Reduced Mass. 2 --> 1, Lagrange Points/Trojan Asteroids	Chap 7
	Collisions. Lab and Center of Mass Frames, Rockets	Chap 7
6 Apr	Moment of Inertia, Perpendicular/Parallel Axis Theorems	Chap 8
8 Apr	Pendulums/Elliptic Integrals, Rolling Balls/Baseball Bats	Chap 8
13 Apr	Motion of Rigid Bodies in 3D, Euler Equations/Angles	Chap 9
15 Apr	Precession and Nutation of the Earth, Bicycles	Chap 9
20 Apr	Lagrangian Mechanics. Hamilton's Variational Principle	Chap 10
22 Apr	Generalized Coordinates. Kinetic and Potential Energies	Chap 10
27 Apr	Harmonic Oscillator, Central Force, Atwood Machine	Chap 10
29 Apr	Euler's Eqns, Generalized Momenta, Ignorable Coordinates	Chap 10
	Lagrange Multipliers, Generalized Forces, Hamiltonians	Chap 10
6 May	COMPREHENSIVE FINAL EXAM, 8:00am, Thursday, not earlier!	

Grading: Homework 25% Midterms 35% Final 40%

Reasonable accomodations will be provided.

Learning Objectives: To learn how about the linear motion of single particles and rigid bodies and rotating bodies. Systems will include harmonic oscillators and central forces. Methods will include those of Newton, Lagrange, and Hamilton.