PHYSICS 5210 WINTER 2012

Instructor: P. Keyes, 239 Physics Research Bldg., tel. 577-2606 , keyes@wayne.edu

Office Hours: Mon. and Wed. 10:45 – 11:45, and by appointment.

Text: *Classical Mechanics* by R. Douglas Gregory (the same text as last semester)

Exams: I - Feb. 6, II - Mar. 5, III - Apr. 9.

Final Exam: 1:20 p.m. - 3:50 p.m., Fri., April 27.

Grading: 1/6 for each hour exam, 1/3 for the final exam, 1/6 for homework.

Homework will be assigned weekly and collected one week later. Late homework will not be accepted.

Topics

Review of PHY5200

(*Chap. 12*) Lagrangian Dynamics: Constrained Motion, Generalized Coordinates, Lagrange's Equations, Generalized Momentum, Symmetries and Conservation Principles. *(HW due 1/25 and 2/1)*

---------- Exam I ----------

(Chap 13) Calculus of Variations, Hamilton's Principle. *(HW due 2/15)*

(Chap. 15) Small Oscillations: Principal Axis Transformation, Normal Modes and Normal Coordinates. *(HW due 2/22)*

(Chap. 16) Kinematics of Rotations and Accelerations. *(HW due 2/29)*

---------- Exam II ----------

(Chap. 17) Accelerated Coordinate Systems, Pseudo-forces. *(HW due 3/21)*

(Chap. 18) The Rotation of Rigid Bodies: Inertia Tensor. *(HW due 3/28)*

(Chap. 19) , Euler's Equations, Torque- free Motion, Precession and Nutation of a Top in a Gravitational Field. *(HW due 4/4)*

---------- Exam III ----------

(Chap. 14) Hamilton's equations and Phase Space

(Chap. 8) Non-linear oscillations, An Introduction to Chaos. *(HW due 4/18)*