ANALYTICAL MECHANICS I (PHY 300)

Instructor: Prof. Bogdan Dabrowski, Physics Department, NIU. You can find me in my office (La Tourette Hall 216; phone: 753-6474) or in my labs La Tourette Hall 215 and FR 110 (phone: 753-6472) on Mondays, Tuesdays, Wednesdays and Fridays. You can also reach me on Thursdays at Argonne National Laboratory (phone: 630-252-5541) or at email dabrowski@anl.gov.

Course meeting time and place: 2:00 – 2:50 PM on MWF at Faraday Hall 237.

Office hours: on Mondays and Wednesdays from 3:00 to 4:00 PM at La Tourette Hall 216.


Chapters and topics we will study:
Ch. 1.1 – 1.7: Newton’s Laws of Motion (3 classes)
Ch. 2.1 – 2.7: Projectile Motion (3 classes)
Ch. 3.1 – 3.5: Momentum and Angular Momentum (2 classes)
Ch. 4.1 – 4.10: Energy, Work and Force (5 classes)
First midterm (1 class)
Ch. 5.1 – 5.9: Harmonic Oscillations (5 classes)
Ch. 6.1 – 6.4: Calculus of Variations (2 classes)
Ch. 7.1 - 7.7: Lagrange’s Equations (3 classes)
Ch. 8.1 – 8.8: Central Force Problems (4 classes)
Second Midterm (1 class)
Ch. 9.1 – 9.10: Mechanics in Noninertial Frames (5 classes)
Ch. 10.1 – 10.5: Rotarion of Rigid Bodies (3 classes)
Ch. 11.1 – 11.7: Coupled Oscillations and Normal Modes (4 classes)
Catch up/Review (1 class)
Final Exam (Mon. December 9, 2-3:50 p.m.)

There will be several problems solved in class for every chapter we study. Additional problems will be assigned as homework every week. I will collect and grade these problems the following week – there is no substitute for solving problems on your own. Your work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced will be regarded as a serious offense.

There will be two closed-books mid-term exams and a final comprehensive exam.

The grades will be based on the total amount of points you would accumulate during the course (homework 30%, two mid-term exams, each 20%, and final exam 30%):

A (4.00)   90 – 100%
A- (3.67)  80 – 89 %
B+ (3.33)  72 – 79%
B (3.00)   64 – 71%
B- (2.67)  56 - 63%
C+ (2.33)  48 – 55%
C (2.00)   40 – 47%
D (1.00)   32 – 39%
F (0.00)   31% or less