Syllabus ENGR 261-3 Dynamics.

(every semester)

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Office Hours: Tu, Th, from 2:00 to 3:00pm and M, W, F from 10:00 to 11:00 am

Overview of the course: Fundamentals of particle and rigid body dynamics. Kinemtics and kinetics of a single particle and system of particles. Application of Newton's laws and energy and moment principles in solving problems involving particles or rigid bodies in planar motion. Introduction to kinetics of rigid bodies in three dimentions.

Prerequsites: MATH 251, PHYS 205B, ENGR 250 with grades of C or better.

Textbook: Beer at. all. *Dynamics-Vector Mechanics for Engineers.* 10th edition. McGraw-Hill

Grading: There will be two tests and one final exam. Homework assignements and quizzes are also graded and counted toward the final grade.

Distribution is as follows:

2 tests – 25% each……50%

1 final exam……25%

Homework assignments……10%

Qizzes……15%

Total……100%

The final grade will be assigned based on the standard SIU distribution:

100%-90% = A

89%-80% = B

79%-70% = C

69%-60% = D Below 60% = F

Rules:

* All necessary free body diagrams and calculations must be clearly shown on all graded work in order to receive full credit.

*All written material must be either legibly hand-written or double –spaced type written.

*No makeup exems will be given. If you know ahead of time that you will miss an exam for some reason, let me know and I may give you an exam early.

*The final exam will be comprehensive. Homework will be due on chosen day of every week.

*Students are expected to be regular and punctual in class attendence. The University believes that students themselves are primarily responsible for attendence, hovewer, excessive or extended absence from the class and or low grades are sufficient reason for the instructor to advise student to drop the course.

TENTATIVE TOPIC OUTLINE

No.	Class time alloted (weeks)	Topics
I.	1.5	Kinematics of particle. Linear and curvilinear motion. Displacement, velocity and acceleration relationship. Relative motion.
II.	0.5	Kinetics of a particle. Introduction to rotation.
III.	0.5	Normal and tangentional forces in rotation.
IV.	1.5	Newton's law of motion. Inertia force. The equations of motion.
V.	1.0	Impulse of the force and momentum. Angular momentum. Conservation of momentum for a system of particles.
VI.		Review and TEST #1
VII.	2.5	Work of the force, potential and kinetic energy, power and efficiency. General energy conserwation equation.

VIII.	1.0	Planar kinematics of a rigid body. Genaral plane motion.
IX.	1.5	Translation and rotation. Introduction to 3DOF motion.
X.		Review and TEST #2
XI.	1.5	Conservation of momentum. Gyroscoping motion.
XII.	1.0	Static and dynamic balancing of rotating mases.
XIII.	1.5	Introduction to vibrations. Energy conservation in a system.
XIV.	1.0	Review and FINAL.

The alloted time during the Summer Semester should be reduced by the factor of 2.