**MECH 220: Engineering Mechanics: Dynamics (3 credits)**

The purpose of the course is to present the foundations and applications of the relationship between forces acting on an object and its motion. This knowledge is essential for the detailed study of further courses such that fluid dynamics, flight dynamics and structural dynamics. The course is also designed to emphasize the critical importance of good problem-solving skills. (Prerequisite: CIVL 200)

**Course Learning Outcomes:**

By the end of the course, students will be able to:

A1. Demonstrate advanced knowledge of the science of dynamics and its applications and distinguish between kinematics and kinetics of a particle and a rigid body in dynamics.

A2. Apply principle of energy and momentum principles in solving problems involving Particles and rigid bodies for 2-D motion.

B1. Solve advance engineering dynamics problems by critically analyzing and describing motion and forces mathematically.

B2. Interpret dynamic system corresponding solution(s) and critique the results to determine the corresponding physical meaning.

B3. Apply advanced dynamic analysis to present an engineering solution(s) graphically and mathematically.

**Course Learning Resources:**

* Bedford and Fowler, Engineering Mechanics: Dynamics, fifth edition. Prentice-Hall. ISBN#0-13-612916-1
* Hibbeler, Engineering Mechanics-Dynamics, tenth edition. Prentice Hall, New Jersey, 2004.
* James L. Meriam, Engineering Mechanics: Dynamics, 8th Edition

**Course Content:**

1. Kinematics of a Particle
2. Kinetics of a Particle: Force and Acceleration
3. Kinetics of a Particle: Work and Energy
4. Kinetics of a Particle: Impulse and Momentum
5. Condition for Rigid -Body Equilibrium and Equations of Equilibrium
6. Planar Kinematics of a Rigid Body
7. Planar Kinetics of a Rigid Body: Force and Acceleration
8. Planar Kinetics of a Rigid Body: Work and Energy
9. Planar Kinetics of a Rigid Body: Impulse and Momentum