Course Outline for: ENGR 2236 Dynamics

A. Course Description:

1. Number of credits: 3
2. Lecture hours per week: 3
3. Prerequisites: PHYS 1121 (C- or better) and MATH 1520 (C- or better)
4. Corequisites: None
5. MnTC Goals: None

This course covers the kinematics and kinetics of particles; Newton's laws; energy and momentum methods; systems of particles; kinematics and kinetics of rigid bodies in the plane; planar linkages; and mechanical vibrations.

B. Date last reviewed/updated: October 2023

C. Outline of Major Content Areas:

1. Motion of a particle.
2. Newton's second law.
3. Linear and angular momentum.
4. Conservation of linear and angular momentum.
5. Kinetic energy and potential energy.
6. Conservation of mechanical energy.
7. Rotation of a rigid body.
8. Coriolis acceleration.
9. Plane motion of a rigid body.
10. Kinetic energy of a rigid body.
11. Principle of work and energy.
12. Vibrations and simple harmonic motion.

D. Course Learning Outcomes:

Upon successful completion of the course, the student will be able to:

1. Do kinematic and kinetic calculations for particles and systems of particles.
2. Do calculations using momentum and energy methods for particles and systems of particles.
3. Do kinematic and kinetic calculations for rigid bodies.
4. Do rigid body linkage calculations.
5. Do particle kinematic and kinetic calculations involving non-inertial coordinate systems.
6. Demonstrate a basic understanding of mechanical vibrations.

E. Methods for Assessing Student Learning:

Methods for assessment may include, but are not limited to, the following:

1. Exams

2. Problem sets
3. Group projects

F. Special Information:

Students must have a graphing calculator.