Common Course Outline for: ENGR 2236 Dynamics

A. Course Description

1. Number of credits: 3
2. Lecture hours per week: 3
   Lab hours per week: 3
3. Prerequisites: ENGR 2235 (C or higher), MATH 2520 (C or higher) or concurrent enrollment
4. Co-requisites: 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. 3 credits, lecture 3 periods.

B. Date Last Revised: April 2017

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. Learning Outcomes:

Upon successful completion of this course, students should 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:

Student evaluation may include exams, problem sets, and group projects.

F. Special Information:

Students must have a graphing calculator.

Relationship to ABET Accreditation Criteria: To assist our transfer partner engineering programs in their ABET accreditation evaluations, this course teaches skills that help students achieve the following ABET outcomes:
(a) an ability to apply knowledge of mathematics, science, and engineering
(e) an ability to identify, formulate, and solve engineering problems
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.