BAKER COLLEGE
STUDENT LEARNING OUTCOMES

ME 2250 Dynamics
3 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Analyze kinematics of particles
   a. Describe the concepts of position, displacement, velocity, and acceleration.
   b. Investigate particle motion along a straight line and represent this motion graphically
   c. Investigate particle motion along a curved path using different coordinate systems
   d. Solve dependent motion of two particles. e. Examine the principles of relative motion of two particles using translating axes
2. Evaluate kinematics of rigid bodies
   a. Classify the various types of rigid-body planar motion.
   b. Investigate rigid-body translation and angular motion about a fixed axis
   c. Study planar motion using an absolute motion analysis
   d. Provide a relative-motion analysis of velocity and acceleration using a translating frame of reference
   e. Show how to find the instantaneous center of zero velocity and determine the velocity of a point on a body using this method
   f. Provide a relative-motion analysis of velocity and acceleration using a rotating frame of reference
3. Analyze kinetics of particles- Force and Acceleration
   a. State Newton's Second Law of Motion and to define mass and weight
   b. Solve the accelerated motion of a particle using the equation of motion with different coordinate systems
4. Evaluate planar kinetics of a rigid body- Force and Acceleration
   a. Examine the methods used to determine the mass moment of inertia of a body
   b. Derive the planar kinetic equations of motion for a symmetric rigid body
   c. Discuss applications of these equations to bodies undergoing translation, rotation about a fixed axis, and general plane motion
5. Analyze kinetics of a particle: Work and Energy
   a. Describe the principle of work and energy and apply it to solve problems that involve force, velocity, and displacement
   b. Study problems that involve power and efficiency
   c. Examine the concept of a conservative force and apply the theorem of conservation of energy to solve kinetic problems

6. Evaluate kinetics of a rigid body: Work and Energy
    a. Examine the formulations for the kinetic energy of a body, and define the various ways a force and couple do work
    b. Apply the principle of work and energy to solve rigid–body planar kinetic problems that involve force, velocity, and displacement
    c. Show how the conservation of energy can be used to solve rigid–body planar kinetic problems
7. Analyze kinetics of a particle: Impulse and Momentum
    a. Describe the principle of linear impulse and momentum for a particle and apply it to solve problems that involve force, velocity, and time
    b. Study the conservation of linear momentum for particles c. Analyze the mechanics of impact d. Examine the concept of angular impulse and momentum
8. Evaluate kinetics of a rigid body: Impulse and Momentum
    a. Describe the formulations for the linear and angular momentum of a rigid body
    b. Discuss the application of conservation of momentum
    c. Analyze the mechanics of eccentric impact

These SLOs are not approved for experiential credit.

Effective: Fall 2017