

EGN 3321 - DYNAMICS
Common Course Syllabus

Catalog Description: 3 CREDITS. Dynamics of particles and rigid bodies, applications of free-body diagrams, Newton's second law, the impulse-momentum method and the work-energy principle to solve dynamic problems in mechanical systems.

Goals: This course is designed to introduce the students to the concepts and applications of engineering dynamics of moving bodies. After finishing the course, the student will be able to relate the forces and moments acting on a body to the resulting motion, and to develop solution procedures using basic principles of mechanics.

Prerequisites:

1. EGN 2311 – Statics or equivalent

Topics: (The number of lectures are guidelines and are subject to change by the instructor.)

1. Introduction
2. Kinematics of particles: rectangular motion, curvilinear motion
3. Kinetics of particles: Newton's equation of motion
4. Kinetics of particles: Work, energy, power, and principle of work and energy
5. Kinetics of particles: Impulse, momentum and impact
6. Planar kinematics of rigid bodies
7. Planar kinetics of rigid bodies: Forces and accelerations, equations of motion
8. Planar kinetics of rigid bodies: Principles of work and energy

Course Outcomes: (numbers in parentheses indicate correlation of the outcome with the appropriate ABET program outcomes 1-7)

1. The student will be able to perform kinematic analysis of particles and plane motion of rigid bodies. (1,2,6)
2. The student will be able to draw the free-body diagram for a particle or for a rigid body in plane motion. (1,2,6)
3. The student will be able to understand the basic concepts of force, mass and acceleration, of work and energy, and of impulse and momentum. (1,2,6)
4. The student will be able to apply these three basic methods and to understand their respective advantages. (1,2,6)
5. The student will be able to effectively communicate in writing a report. (3)

Design and Laboratory Content: none

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