Virginia Western Community College
EGR 245
Dynamics

Prerequisites
EGR 240

Corequisites
none

Course Description
Presents approach to kinematics and kinetics of particles (and systems of particles) in linear and curvilinear motion. Includes kinematics and kinetics of rigid bodies in plane motion. Teaches Newton's second law, work-energy, and impulse-momentum methods. Lecture 3 hours per week.

Semester Credits: 3 Lecture Hours: 3 Lab/Clinical/Internship Hours: 0

Required Materials

Textbooks:
Engineering Mechanics Dynamics & Mastering Engineering Package, 14/E, Author: Russell C. Hibbeler, Publisher: Pearson Prentice Hall, ISBN# 9780134116990.

Other Required Materials:
Engineering Computation Paper
Calculator
All Homework will be handled through www.masteringengineering.com

General Course Purpose

Prepare students for further studies in branches of engineering requiring mechanics.

See: https://courses.vccs.edu/courses/EGR245-Dynamics/detail

Course Outcomes

At the completion of this course, the student should be able to utilize the following:

- Critical Thinking
    - Select an appropriate coordinate system (Cartesian, normal-tangential, cylindrical) and analyze the motion of particles and rigid bodies.
    - Analyze the motion of particles and rigid bodies using different coordinate systems.
    - Analyze the motion of bodies relative to translating and/or rotating coordinate frames.
    - Use the equations of motion to compute the position, velocity, and acceleration of multiple points on rigid bodies in constrained motion.
    - Construct free-body diagrams and apply Newton's Second Law to analyze the dynamics of particles and planar rigid body motion.
    - Apply the work-energy principle, linear-impulse and momentum, angular-impulse and momentum, and conservation theorems (conservation of linear momentum, angular momentum, and energy) to particles and rigid bodies undergoing planar motion.
    - Analyze the motion of impacting particles using impulse and momentum concepts.
- Quantitative Reasoning
    - Calculate the mass moment of inertia of rigid body

Topical Description

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- Apply the work-energy principle, linear-impulse and momentum, angular-impulse and momentum, and conservation theorems (conservation of linear momentum, angular momentum, and energy) to particles and rigid bodies undergoing planar motion.
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- Quantitative Reasoning
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Notes to Instructors

- All instructors teaching this course will use the same textbook.
- Course content within this course may be covered at the instructor's discretion but with all topics being covered.
- This course and its grade will be structured around a minimum of homework, 2 tests, final exam and homework.
- At the end of the semester, all instructors will give the outcome assessment as it relates to the final exam to the program head at the same time they prepare their student final grades.
- A comprehensive final exam will be given, which must be at least 10% of the final grade.

ADA Statement (PDF)
Title IX Statement (PDF)