

COURSE OUTLINE

Revision: Mike Steffancin, February 2008

DEPARTMENT:	Academic Programs
CURRICULUM:	Engineering
COURSE TITLE:	Dynamics
COURSE NUMBER:	ENGR& 215
TYPE OF COURSE:	Academic Transfer
COURSE LENGTH:	1 quarter
CREDIT HOURS:	5
LECTURE HOURS:	55
LAB HOURS:	0
CLASS SIZE:	25
PREREQUISITES:	ENGR& 214 (Statics) with "2.5" or better and MATH& 153 (Calculus III)

COURSE DESCRIPTION:

A study of motion and the forces which affect motion, includes rectilinear motion, curvilinear motion, plane motion, dynamic force analysis, work and energy, impulse and momentum.

STUDENT LEARNING OUTCOMES ADDRESSED:

1. Critical Thinking and Problem-Solving – Analyze and apply principles of engineering mechanics.
2. Computation – Utilize calculus to solve engineering problems.
3. Technology – Use current data/information in engineering mechanics.
4. Information Literacy – Access and use information from variety of resources/data.
5. Personal Responsibility – Take pride and value in own work.

ENGR& 215 Dynamics

February 2008

GENERAL COURSE OBJECTIVES:

At the end of the course the student will:

1. Distinguish between distance and the displacement; speed and velocity.
2. Solve for displacement, velocity, and acceleration using the equations of constant acceleration rectilinear kinematics for objects in motion, including projectile motion.
3. Distinguish between and calculate values of tangential acceleration, normal acceleration, and total acceleration.
4. Solve for values of angular displacement, velocity, or acceleration using the equations of angular motion with uniform acceleration.
5. Solve for linear values of displacement, velocity, or acceleration in either absolute or relative terms.
6. Determine both linear and angular velocities of various mechanisms by means of instantaneous centers.
7. Solve for force, linear acceleration, and angular acceleration of plane motion.
8. Calculate the work of a constant force and the work of a variable force.
9. Apply the conservation of energy principles to linear, angular, and plane motion.
10. Calculate power and efficiency.
11. Use the impulse momentum method to solve problems with the following motions: linear, angular, plane, and combined linear and angular.
12. Apply the conservation of momentum method to solve for various velocities for both linear and angular motion.

TOPICAL OUTLINE:

APPROX. HOURS

I.	Principles of Dynamics	2
II.	Kinematics of a Particle	8
III.	Kinetics of a Particle: Force and Acceleration	5
IV.	Kinetics of a Particle: Work and Energy	5
V.	Kinetics of a Particle: Impulse and Momentum	5
VI.	Planar Kinematics of Rigid Body	10

ENGR& 215 Dynamics
February 2008

TOPICAL OUTLINE:	APPROX. HOURS
VII. Planar Kinematics of Rigid Body: Force and Acceleration	5
VIII. Planar Kinematics of Rigid Body: Work and Energy	5
IX. Planar Kinematics of Rigid Body: Impulse and Momentum	10
Total hours	55

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ENGR& 215

Course Prefix and Number: ENGR& 214

Course Title: Dynamics

SLO #	Included in Course Objective Number	SSCC Student Learning Outcomes
SLO 1.1	1, 3	Communication - Read and listen actively
SLO 1.2		Communication - Speak and write effectively
SLO 2.1	2-12	Computation - Use mathematical operations
SLO 2.2	2-12	Computation - Apply quantitative skills
SLO 2.3	1-12	Computation - Identify, interpret, and utilize higher level mathematical and cognitive skills
SLO 3.1		Human Relations - Use social interactive skills to work in groups effectively
SLO 3.2		Human Relations - Recognize the diversity of cultural influences and values
SLO 4.1	1-12	Critical Thinking and Problem Solving -
SLO 5.1		Technology - Select and use appropriate technological tools
SLO 6.1		Personal Responsibility - Be motivated and able to continue learning and adapt to change
SLO 6.2		Personal Responsibility - Value one's own skills, abilities, ideas and art
SLO 6.3		Personal Responsibility - Take pride in one's work
SLO 6.4		Personal Responsibility - Manage personal health and safety
SLO 6.5		Personal Responsibility - Be aware of civic and environmental issues
SLO 7.1	1,3	Information Literacy - Access and evaluate information
SLO 7.2	1,3	Information Literacy - Use information to achieve personal, academic, and career goals, as well as to participate in a democratic society

PREPARED BY: Mike Steffancin
DATE: May 2008