

ENG ME 302 Engineering Mechanics II

2008 - 2009 Catalog Data:

ENG ME 302 Engineering Mechanics II Prereq: ENG EK 301. Fundamentals of engineering dynamics. Kinetics of rigid bodies in two and three dimensions. Impulsive motion; impact. Energy and momentum methods. Mechanical vibrations of linear single-degree-of-freedom systems. 4 cr, either sem.

Class/Lab Schedule: 4 lecture hours per week

Status in the Curriculum: Required

Textbook(s) and/or Other Required Material:

J. H. Williams, Jr., Fundamentals of Applied Dynamics, Revised, Wiley, 1996
E.W. Nelson, C.L. Best, and W.G. McLean, Engineering Mechanics Statics and Dynamics, 5th ed., Schaum's Outlines, McGraw Hill, 1998.

Coordinator: Tyrone Porter, Assistant Professor, Mechanical Engineering

Prerequisites by Topic:

1. Statics of particles and rigid bodies.
2. Kinematics and kinetics of particles.
3. Kinetics of particles: Energy and momentum methods.

Goals:

This course is designed to introduce juniors in Mechanical Engineering to the theory and application of engineering mechanics; it is aimed at helping engineering students develop an ability to apply well-established physical principles to analyze and solve problems pertaining to bodies undergoing accelerated motion.

Course Learning Outcomes:

As an outcome of completing this course, students will:

- i. Become proficient in the modeling and analysis of simple dynamic systems-** both systems of simple particles and also rigid bodies in two and three dimensions - including the choice and use of appropriate analysis methods (kinematics, kinetics, energy and momentum methods, impact, and single degree of freedom vibrations). (A, E, L)
- ii. Gain experience and confidence in the use of computers to solve dynamic problems** through the development and use of a MATLAB program in the term project. (E, K, L)
- iii. Gain an appreciation of and a facility for producing well-organized and clearly written work** to facilitate communications with others and review by supervisors. (G)

Course Learning Outcomes mapped to Program Outcomes:

(For Program Outcomes, please see attached page or Department Web Site)

Program:	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Course:	i	-	i	ii, iii	i, ii	-	iii	i	i	i	ii	i, ii	-	i
Emphasis:	5	1	2	2	5	1	4	2	2	2	3	3	1	2

Topics (time spent in weeks):

1. Kinematics of a particle relative to stationary and moving frames of reference (1)
2. Kinetics of a particle, including energy and momentum methods and impact (2)
3. Kinematics of systems of particles (0.5)
4. Kinetics of systems of particles (1.5)
5. Kinematics of rigid bodies (3.5)
6. Kinetics of rigid bodies, including energy and momentum methods and impact (3.5)
7. Mechanical vibrations (2)

Contribution of Course to Meeting the Requirements of Criterion 5:

Engineering Topics: 100%

Status of Continuous Improvement Review of this Course:**Date:** April 16, 2009**Reviewed by:** Structures-Dynamics Committee**Prepared by:** Tyrone Porter **Date:** January 17, 2009