COURSE SYLLABUS

Course Number: MEGR 3121
Course Name: Dynamic Systems I

Credits and Contact Hours: 3

Instructor: Staff

Textbook: Meriam and Kraige, Engineering Mechanics: Dynamics, 6th Ed., John Wiley & Sons, 2010.

Catalog Description: The kinematics and kinetics of rigid bodies. Work-energy and impulse-momentum principles and conservation laws. Introduction to the kinematics of mechanisms.
Most Recently Offered (Day): Spring 2016, Fall 2015, Summer 2015
Most Recently Offered (Evening): Course has not been offered in 3 years

Pre-Requisites/Co-Requisites: MEGR 2141 and MATH 1242 with grades of C or above.

Course is: Required (R)

Goals: The goal of this course is to introduce students to the mathematical modeling of systems. Students will focus on the dynamic behavior of idealized particle and rigid body models for mechanical components and systems.

As the conclusion of this course, the students will be able to:

- Model various mechanical systems for dynamic analysis;
- Identify appropriate solution techniques for systems with various constraints (constant acceleration, conservation of energy, conservation of momentum, etc.);
- Apply work-energy methods to different system states;
- Apply impulse-momentum methods to systems of interacting components; and
- Model dynamic systems in a manner suitable for computer solution.

Student Outcomes Addressed:

A. an ability to apply knowledge of mathematics, science, and engineering

Course Topics:

- Particle kinematics
- Relative motion and acceleration
- Particle kinetics
- Analysis of systems of particles, fluid flow
- Work-energy methods

- Impulse-momentum methods, impact
- Plane kinematics, instant center
- Fixed axis rotation and general motion in the plane
- Angular acceleration
- Plane kinetics
- Gear and pulley systems
- Four-bar linkages