



WISCONSIN

UNIVERSITY OF WISCONSIN-MADISON

University of Wisconsin - Madison
College of Engineering [EGR]
Last Offered: 2015 Spring [1154]
Direct Link to this Syllabus :

<http://aefis.engr.wisc.edu/index.cfm/page/CourseAdmin.ViewABET?coursecatalogid=303&pdf=True>

1. **ME 240, Dynamics**
2. **Credits : 3 Contact Hours : 2.5**
3. **Textbook and Materials :** Engineering Dynamics: Dynamics + ConnectPlus Access Card For Dynamics; Gray, Costanzo, Plesha; 2; No Year Given
4. **Specific Course Information :**
 - a. **Brief description of the content of the course (Course Catalog Description) :** Rectilinear and curvilinear motion of a particle; force, mass, acceleration; work, potential, and kinetic energy; impulse and momentum; kinematics of rigid bodies; moving coordinate systems with relative motion; general planar rigid body kinematics and kinetics. Applications to linkages, cams and geared systems.
 - b. **Pre-requisites or Co-requisites :** EMA 201, Math 222
 - c. **This is a Required course.**

- **Specific Goals for the Course :**

- a. **Course Outcomes :**

1. The primary objective of ME 240 -- Dynamics is to introduce students to the concepts of dynamics. The students are expected to develop working skills in the dynamic analysis of both particles and rigid bodies. A special emphasis is placed on mechanical components, such as mechanisms, linkages, and gears.
2. Develop the kinematics of displacement, velocity and acceleration for systems of particles and rigid bodies
3. Determine the dynamic response of the system to applied loadings, using Newton's Laws
4. Apply the Principle of Work and Energy and the Principle of Impulse and Momentum to mechanical systems
5. Analyze the motion of sliders, linkages, and gears regarding their performance and mechanical attributes

- **ABET Student Learning Outcomes :**

- (a) Ability to apply mathematics, science and engineering principles.
- (e) Ability to identify, formulate and solve engineering problems.

- **Brief List of Topics to be Covered :** Kinematics of Particles – Rectilinear and Curvilinear Motion;
Kinetics of Particles – Newton's Second Law;
Kinetics of Particles – Principle of Work and Energy;
Kinetics of Particles – Principle of Impulse and Momentum;
Kinematics of Rigid Bodies – General Plane Motion;
Kinematics of Rigid Bodies – Rotating Axes, Coriolis Acceleration;
Planar Kinetics of Rigid Bodies – Newton's Second Law;
Planar Kinetics of Rigid Bodies – Principle of Work and Energy;
Planar Kinetics of Rigid Bodies – Principle of Impulse and Momentum;

