University of Toledo
Mechanical Engineering Technology
Master Syllabus

Course Title: *Applied Dynamics*   **Course Code & Number:** *MET 3400*

Credit Hour Total: *3*

Lecture Contact Hours: *3*   **Lab Contact Hours:** *0*

Prerequisite(s): *MET 2100, MATH 2460*

Text: *Engineering Mechanics: Dynamics, 14th Edition, R.C. Hibbeler, 2016*

Software: *None*

Course Description: (Approved Catalog Description)
Static force and moment analysis using vector methods. Applications of dry friction. Analysis of structures and machines. Dynamic analysis using force and acceleration, energy and momentum methods.

Related Program Outcomes:
Outcomes a, b. Students will demonstrate the ability to select and apply their knowledge of math, science, and engineering as well as their techniques, skills, to solve ET activities involving moving of systems and components.
Outcome f. Develop the ability to identify, analyze, and solve problems in dynamics as demonstrated through problem quizzes administered during the semester.

Course Objectives:
Upon completion of this course, the students will be able to:

    1. Perform vector analysis in three dimensions
    2. Investigate curvilinear motion of particles using rectangular, normal and tangential, and cylindrical components
    3. Study the use of force and acceleration in analyzing particle and rigid body motion
    4. Discuss energy and study it use in analyzing particle and rigid body motion
    5. Define impulses and discuss momentum methods to analyze particle and rigid body motion

Course Outline:

- Vector analysis methodology
- Curvilinear motion of particles using rectangular, normal and tangential, and cylindrical components
- Newton's Law of Motion for particles
- The principle of work and energy and its application to particles
- The principle of linear impulse and momentum applied to particles
- Curvilinear motion of rigid bodies using rectangular, normal and tangential, and cylindrical components
- Newton's Law of motion for translation and rotation of rigid bodies and mechanisms
- Work and energy methods applied to rigid bodies and mechanisms
- Linear and rotational impulse and momentum methods for analyzing the motion rigid bodies and mechanisms.