



Course Name: MEC-204 Dynamics for Technology

Date Updated: 4/2022

Credit Hours/week: 2 hrs./wk. – 2 cr.

BEGINNING: SPRING 2022

Catalog Description: This course provides an understanding of the mathematics of the motion of particles and rigid bodies, and of the relation of forces and motion of particles. Upon successful completion of this course, students will describe the motion of particles and rigid bodies as functions of time and position, develop their equations of motions due to applied forces, and determine post impact behavior.

Prerequisite: MAT 110, MEC 104

Corerequisite: PHY-111

Text: Machines and Mechanisms, 4th Edition, Myszka

Supplementary Material: Check Blackboard for Notes

Syllabus:

Topics:
Review of linear velocity and acceleration
Review of vectors and concept of relative velocity
Mechanisms to describe various paths, introduction to four bar linkages, instant centers and Kennedy's Theorem
Three graphical methods for finding velocities
Accelerations in mechanisms
Motion curves
Cams
Gears

Students are expected to adhere to the policies of the County College of Morris. These can be accessed at: (insert link here)

Statement of Expected Course LEARNING OUTCOMES

- Prepare kinematic diagrams of mechanisms according to standard techniques
- Graphically or analytically, determine the displacement of any point on a mechanism Construct the path of motion of any point in the mechanism
- Design a linkage to achieve a desired displacement
- Graphically and analytically, determine the velocity of any point on a mechanism
- Graphically and analytically, determine the acceleration of any point on a mechanism
- Construct motion diagrams for any point on a mechanism
- Complete a project which involves the design, analysis, selection of necessary hardware and technical drawings for a practical mechanism
- Specify the cyclical motion for a cam follower during simple harmonic, parabolic, and cycloidal rise and fall sequences
- Design a plate cam to give a roller follower a specified motion
- Identify and calculate common geometric features and properties of gears
- Determine the velocities of gears in a gear train
- Select belt and chain drives to achieve a desired velocity ratio. Determine the motion of mechanisms utilizing screw actuators

Statement of Relation to Curriculum(s):

Serves as an elective in the Mechanical Engineering Technology Program