

# Inver Hills Community College

## ENGR 2025: Dynamics

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites:

This course requires all three of these prerequisites

ENGR 2020 - Statics

MATH 1134 - Calculus II (Minimum grade: 2.0 GPA Equivalent)

PHYS 1081 - Calculus Based Physics I

Corequisites: None

MnTC Goals: None

Provides a foundation in kinematics and kinetics of particles, system of particles, and of rigid bodies, includes Newton's Laws, Energy and Momentum methods. Other topics: Plane motion of rigid bodies and Mechanical vibrations. Prerequisites: ENGR 2020, MATH 1134, PHYS 1081.

**B. COURSE EFFECTIVE DATES:** 01/01/1998 - Present

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Kinematics of Particles (10%)
2. Kinetics of Particles: Newton's Laws (10%)
3. Kinetics of Particles: Energy and Momentum Methods (20%)
4. Systems of Particles (7%)
5. Kinematics of Rigid Bodies (12%)
6. Plane Motion of Rigid Bodies: Force and Acceleration (12%)
7. Plane Motion of Rigid Bodies: Energy and Momentum Methods (12%)
8. Kinetics of Rigid Bodies in Three Dimensions (2%)
9. Mechanical Vibration (15%)

### D. LEARNING OUTCOMES (General)

1. Express velocities and accelerations as vectors and perform vector operations.
2. Perform kinematic and kinetic calculations for particles, systems of particles, and rigid bodies.
3. Perform calculations using momentum and energy methods for particles, systems of particles, and rigid bodies.
4. Perform rigid body linkage calculations.
5. Perform calculations with respect to a rotating frame.
6. Demonstrate a basic understanding of mechanical vibrations.

### E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

### F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted