

# Inver Hills Community College

## ENGR 2020: Statics

### A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 3

Lab Hours/Week: 0

OJT Hours/Week: \*.\*

Prerequisites:

This course requires the following prerequisite

MATH 1133 - Calculus I (Minimum grade: 2.0 GPA Equivalent)

Corequisites: None

MnTC Goals: None

Provides a foundation in engineering analysis of rigid bodies in static equilibrium. Topics include: Force and moment vectors. Free-body diagrams, systems, equilibrium, analysis of forces acting on structural and machine elements, friction, centroids, and moments of inertia. Prerequisites: A grade of C or higher in MATH 1133. PHYS 1081 strongly recommended.

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

### C. OUTLINE OF MAJOR CONTENT AREAS

1. Position and Force vectors (8%)
2. Particle Equilibrium (8%)
3. Moment vectors (8%)
4. Equivalent force and moment representations (8%)
5. Rigid body equilibrium (10%)
6. Analysis of Structures, Planar Trusses, and Mechanisms in Equilibrium (20%)
7. Internal Force and Moments, inc. Shear and Bending Moment Diagrams (10%)
8. Friction (8 %)
9. Center of Area, Mass, and Gravity ( 10 %)
10. Second Moment of Area and Mass (10 %)

### D. LEARNING OUTCOMES (General)

1. Express forces as vectors and compute unit vectors for forces.
2. Draw an accurate free body diagram, identifying all relevant forces.
3. Calculate the support reactions necessary for static equilibrium.
4. Calculate forces in a planar truss using the method of joints, and the method of sections.
5. Analyze distributed loads.
6. Analyze internal forces, shear and moments in beams and at joints. Include generating shear and moment diagrams.
7. Calculate centroids and moments of inertia.
8. Solve static equilibrium problems involving friction.

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

None

**F. LEARNER OUTCOMES ASSESSMENT**

As noted on course syllabus

**G. SPECIAL INFORMATION**

None noted