

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY**  
**EGR 130 - STATICS AND STRENGTH OF MATERIALS FOR ENGINEERING TECHNOLOGY (5 CR.)**

**Course Description**

Presents principles and applications of free-body diagrams of force systems in equilibrium. Analyzes frames and trusses. Presents principles and applications to problems in friction, centroids, and moments of inertia. Includes properties of materials, stress, strain, elasticity, design of connections, shear and bending in statically determinate beams, and axially loaded columns. Lecture 4 hours. Laboratory 2 hours. Total 6 hours per week.

**General Course Purpose**

The purpose is to introduce the student to the fundamental principles which characterize forces on bodies at rest and the properties, characteristics, and design of structural members of mechanical systems. Student will be able to solve fundamental mechanics problems and determine stresses and deformations of structures caused by systems of forces. Student will learn mechanical properties and their application in determining the structural members' size and shape.

**Course Prerequisites/Corequisites**

Prerequisites: MTH 161 and MTH 162, or MTH 167 or equivalent.

**Course Objectives**

Upon completion of the course the student will be able to:

- Draw free body diagrams
- Represent several forces acting on body as a force couple system
- Solve mechanics problems involving trusses, frames and machines
- Calculate the centroid, center of gravity and moment of inertia
- Calculate the internal forces and draw the shear and bending moment diagrams
- Solve mechanics problems involving dry friction
- Use properties of materials in identifying the sizes of the structural members
- Solve problems involving torsion and torsional deflection
- Calculate the different stresses and deformation in structural members including combined stresses and columns

**Major Topics To Be Included**

- Forces and forces systems
- Free body diagrams
- Moments
- Trusses
- Friction
- Properties of materials
- Centroids and moments of inertia
- Stress and strain
- Beams: bending, shear, deflection
- Shafts: torsion
- Combined stresses
- Columns

**Extra Topics (Optional)**

- Threaded Fasteners
- Descriptive Geometry Techniques, such as: determining the dihedral angle between two planes, rotation
- Assembly Drawings