

Course Code: ENS 202 (IAI EGR 945)

Course Title: Engineering Mechanics of Solids

Department: Natural Sciences

Effective Date: Summer 2026

PCS Code: 1.1 - Baccalaureate/Transfer

CIP Code: 14.1101

Repeatability: 0

Credit Hours

Catalog Notation: 2-2-3

Credit Hour Distribution:

Lecture: 2

Lab: 2

Clinical: 0

Total: 3

General Course Information

Catalog Description

Topics: stress, strain, torsion, deformations, thermal stresses, thin-walled vessels, bending stresses and strains, transverse loading of beams, shear stress and combined loadings, Mohr's circle, beam design, shaft design, shear moment diagrams, beam deflection, energy methods and columns.

General Course Objectives

Demonstrate the ability and skills to analyze and interpret stress, strain, deformation, deflection, and loading in a variety of materials and conditions.

Minimum Placement Levels

English	Reading	Math
None	Placement out of CCS 098	None

Prerequisites

Credit in ENS 201

Methods of Evaluation

Homework of textbook problems. 2 in-class exams related to textbook problems; 1 two-hour cumulative final exam.

Instructional Materials and Additional Supplies

Mastering Engineering with Pearson eText for Mechanics of Materials, Hibbler, 11th edition (2022 update). <https://www.pearson.com/en-us/subject-catalog/p/mechanics-of-materials/P200000003409/9780137605279> ISBN 9780137605279

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Axial Loading	1. Compute the stress, strain, and deformation in a member carrying axial tensile or compressive loads.	3	3	0
Mechanical Properties of Materials	1. Compute stress-strain behavior of ductile and brittle materials.	2	2	0
Torsion	1. Compute torsional shear stress and deformation.	3	3	0
Bending	1. Compute bending stresses.	3	3	0
Transverse Shear	1. Compute direct shear stress.	3	3	0
Beams	1. Compute shear stress in beams. 2. Compute the stress due to loading in beams. 3. Compute resultant stresses due to axial, shear, and bending effects. 4. Compute the deflection of beams due to a variety of loading and support.	10	10	0
Stress and Strain Transformation	1. Evaluate stresses using Mohr's circle.	4	4	0
Energy Methods	1. Compute strain energy for various types of loading.	2	2	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
30	30	0