

SYLLABUS  
PART I  
EDISON COMMUNITY COLLEGE  
MET 212S APPLIED STRENGTH OF MATERIALS  
3 CREDIT HOURS

**COURSE DESCRIPTION**

Non-calculus based study of Hooke's law; axial, bending and shearing stresses; deflection and rotation; beams, columns, and tension members. Prerequisite: MET 125S, PHY 121S.

**COURSE GOALS**

The student will:

Bloom's Level		Program Outcomes
3	1. Classify design stresses into compressive, tensile, shear, or some combination of these three.	2
3	2. Apply appropriate factors of safety to designs.	2, 6
3	3. Identify the concept of strain and calculate strain on a structural member under load.	2
3	4. Apply Hooke's law to find stress or strain in a design situation.	2
3	5. Use Poisson's ratio to find either axial or lateral strains.	2
1	6. Identify resources available for finding Poisson's ratio, Young's modulus, Ultimate strengths, and other parameters for various engineering materials.	2
2	7. Recognize where stress concentrations may occur in a design.	2
3	8. Calculate changes in length of, or stresses in structural members resulting from temperature changes.	2
5	9. Design riveted or welded joints.	2, 6
3	10. Size power transmission shafts.	2, 6
3	11. Construct shear and moment diagrams for design of structural beams and size those beams for the given design loadings.	2, 6
3	12. Calculate the deflection in a structural member under load.	2
3	13. Apply the three-moment equation to find support reactions of statically indeterminate beams.	2
5	14. Design for combined stresses using techniques such as Mohr's circle.	2, 6
5	15. Design columns of various materials using Euler's, or other industry-recommended formulas.	2, 6

**CORE VALUES**

The Core Values are a set of principles which guide in creating educational programs and environments at Edison. They include communication, ethics, critical thinking, human diversity, inquiry/respect for learning, and interpersonal skills/teamwork. The goals, objectives, and activities in this course will introduce/reinforce these Core Values whenever appropriate.

**TOPIC OUTLINE**

1. Simple Stress and Strain
2. Torsion
3. Shear and Moment in Beams

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4. Stresses in Beams and Beam Deflections
5. Restrained and Continuous Beams
6. Combined Stresses
7. Reinforced Beams
8. Columns
9. Riveted, Bolted, and Welded Connections
10. Inelastic Action