

COURSE OUTLINE

Revision: Loc Nguyen, August 2009

DEPARTMENT:	Engineering Technology
CURRICULLUM:	Mechanical Engineering Technology
COURSE TITLE:	Technical Strength of Materials
COURSE NUMBER:	MET 210
TYPE OF COURSE:	Vocational Preparatory
COURSE LENGTH:	1 quarter
CREDIT HOURS:	4
LECTURE HOURS:	33
LAB HOURS:	22
CLASS SIZE:	24
PREREQUISITES:	MET 205 (Technical Statistics)

COURSE DESCRIPTION:

The principles of tension, compression, and shear stress are studied to determine the correct size for structural beams and shafts. Examination of distribution and magnitude of stress in welded, and riveted joints, thin-walled cylinders, torsional members, and beams.

STUDENT LEARNING OUTCOMES ADDRESSED:

1. Critical Thinking and Problem-Solving - Analyze and apply principles of engineering mechanics.
2. Computation - Utilize college algebra and trigonometry to solve engineering problems.

STUDENT LEARNING OUTCOMES ADDRESSED: (cont.)

3. Technology: Use current data/information in engineering mechanics.
4. Information Literacy: Access and use information from variety of resources/data.
5. Personal Responsibility: Take pride and value in own work.

GENERAL COURSE OBJECTIVES:

At the end of the course the student will:

1. Acquire knowledge in relations between externally applied loads and their internal effect on bodies.
2. State the definitions of normal stress, strain, Poisson's ratio, modulus of elasticity, proportional limit, elastic limit, yield point, homogeneous, and linearly elastic material.
3. Construct force-deformation and stress-strain diagram from a given set of data points as obtained from a laboratory experiment.
4. Determine shearing stresses, angular deflection and strains on circular torsion members.
5. Analyze a riveted or bolted joint for shear, tensile force and bearing capacity.
6. Analyze welded joints with concentric loads.
7. Write shear and bending-moment equations, and draw shear and bending-moment diagrams for beams loaded with concentrated and/or uniformly distributed loads.
8. Calculate the maximum tensile flexure stress and state where they occur in a given beam.
9. Determine the principal stresses and maximum shear stress in a given beam and where they occur.
10. Determine the lateral deflections of long slender beams by the method of superposition.
11. Analyze the effect of combined loads on machine members.

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August 2009

TOPICAL OUTLINE:	APPROX. HOURS
I. Introduction	1
II. Equilibrium	2
III. Stress	5
IV. Deformation/tension	5
V. Principles of super position	5
VI. Stresses	6
VII. Diagrams	3
VIII. Deformation and flexural formulas	2
IX. Bending	2
X. Shear	3
XI. Beam design	3
XII. Shaft design	5
XIII. Slope and displacement	5
XIV. Thin-walled pressure vessel	3
XV. Plane stress	<u>5</u>
Total	55

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Course Prefix and Number: MET 210

Course Title: Technical Strength of Materials

SLO #	Included in Course Objective Number	SSCC Student Learning Outcomes
SLO 1.1	1 - 11	Communication - Read and listen actively
SLO 1.2		Communication - Speak and write effectively
SLO 2.1	1 - 11	Computation - Use mathematical operations
SLO 2.2	1 - 11	Computation - Apply quantitative skills
SLO 2.3	1 - 11	Computation - Identify, interpret, and utilize higher level mathematical and cognitive skills
SLO 3.1		Human Relations - Use social interactive skills to work in groups effectively
SLO 3.2		Human Relations - Recognize the diversity of cultural influences and values
SLO 4.1	1 - 11	Critical Thinking and Problem Solving -
SLO 5.1	1 - 11	Technology - Select and use appropriate technological tools
SLO 6.1	1 - 11	Personal Responsibility - Be motivated and able to continue learning and adapt to change
SLO 6.2	1 - 11	Personal Responsibility - Value one's own skills, abilities, ideas and art
SLO 6.3	1 - 11	Personal Responsibility - Take pride in one's work
SLO 6.4		Personal Responsibility - Manage personal health and safety
SLO 6.5		Personal Responsibility - Be aware of civic and environmental issues
SLO 7.1	1 - 11	Information Literacy - Access and evaluate information
SLO 7.2	1 - 11	Information Literacy - Use information to achieve personal, academic, and career goals, as well as to participate in a democratic society

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