

EGM 5653 - INTRODUCTION TO ELASTICITY
Common Course Syllabus

Catalog Description: 3 CREDITS. Prerequisite: EGM 3524. Analysis of stress, strain and deformation. Compatibility, equilibrium and constitutive equations. Two-dimensional problems in rectangular and polar coordinates. Variational principles. Thermal stress.

Goals: To introduce the essential elements of elasticity, providing a foundation for studies in solid mechanics, materials science and engineering design.

Topics:

1. Basic Concepts
2. Analysis of Stress
3. Analysis of Strain
4. Equation of Elasticity
5. Plane stress and plane strain
6. Two dimensional problems in rectangular coordinates
7. Introduction to variational principles
8. Thermal Stress

Course Outcomes:

1. The students will understand the principles of stress, strain and deformation of solids and their constitutive relations.
2. The students will be able to formulate the equilibrium and compatibility differential equations.
3. The students will be able to solve differential equations for various loading and displacement boundary conditions.
4. The students will be able to perform the stress analysis for various engineering problems, and to demonstrate and apply the results for engineering design improvement.
5. The students will be able to employ variational principles to solve various engineering problems.

Prepared by C.T. Tsai, 4/01, modified 6/02