

AMTS10 SOLID MECHANICS

UNIT-1 ANALYSIS OF STRESS

- 1.1 Introduction, stress, complementary shear stress, simple shear, the state of pure shear,
- 1.2 Principal stresses and principal planes, sign convention,
- 1.3 Mohr's circle for biaxial stresses, Mohr's circle.

UNIT-2 ANALYSIS OF STRAIN

- 2.1 Introduction, Strain on an Oblique Plane,
- 2.2 Mohr's Circle Of Strain, Compatibility Equations

UNIT-3 STRESS-STRAIN RELATIONS FOR LINEARLY ELASTIC SOLIDS

- 3.1 Introduction, Hooke's Law, Poisson's Ratio,
- 3.2 Differential Equation of Equilibrium,
- 3.3 The Stress Function Plane Stress

UNIT-4 THEORY OF FAILURE

- 4.1 Introduction, Maximum Principal Stress Theory,
- 4.2 Maximum Shearing Stress Theory, Maximum Strain Theory,
- 4.3 Significance of Theories of Failure, Factor of Safety

UNIT-5 ELASTIC STABILITY

- 5.1 Introduction, Failure Of A Column Or Strut
- 5.2 Euler's Column Theory
- 5.3 A Sign Conventions , Limitation Of Euler's Formula
- 5.4 Empirical Formula For Columns,
- 5.5 Rankine's Formula For Columns, Euler's Formula

Reference Books:

1. Advanced Mechanics of Solids Book by L. S. Srinath
2. Engineering Mechanics of Solids Textbook by Egor Popov