

AMAE27 EXPERIMENTAL STRESS ANALYSIS

UNIT-1 MEASUREMENTS & EXTENSOMETER

- 1.1 Principles of measurements, Accuracy, Sensitivity and range of measurements.
- 1.2 Mechanical, Optical Acoustical and Electrical extensometers and their uses, Advantages and disadvantages.

UNIT-2 ELECTRICAL RESISTANCE STRAIN GAUGES

- 2.1 Principle of operation and requirements, Types and their uses, Materials for strain gauge.
- 2.2 Calibration and temperature compensation, cross sensitivity,
- 2.3 Rosette analysis, Wheatstone bridge and potentiometer circuits for static and dynamic strain measurements, strain indicators.

UNIT-3 PHOTOELASTICITY

- 3.1 Two dimensional photo elasticity,
- 3.2 Concept of light- photoelastic effects, stress optic law,
- 3.3 Interpretation of fringe pattern, Compensation and separation techniques,
- 3.4 Photo elastic materials. Introduction to three dimensional photo elasticity.

UNIT-4 BRITTLE COATING AND MOIRE METHODS

- 4.1 Introduction to Moire techniques, brittle coating methods and holography.

UNIT-5 NON-DESTRUCTIVE TESTING

- 5.1 Fundamentals of NDT, Radiography, ultrasonic, magnetic particle inspection,
- 5.2 Fluorescent penetrant technique,
- 5.3 Eddy current testing, Acoustic Emission Technique.

References Books:

1. Dally, J.W., and Riley, W.F., "Experimental Stress Analysis", McGraw-Hill Inc., New York, 2005, IV edition.