

### **ME 665 Experimental Stress Analysis (2-0-2-6)**

Review of analysis of stress and strain – basic equations of elasticity. Introduction to ideal requirements of strain measuring devices – mechanical, optical and electrical strain gauges Electrical Resistance Strain Gauges -- Gauge Factor, Types, Gauge materials, Backing Materials, Adhesives, Protective Coatings, Bonding of Strain Gauges, Lead wires and connections, Semiconductor strain gauges Performance of Strain Gauges – Temperature compensation, Transverse sensitivity, Gauge Length, Response, Excitation level, Stability. Strain Gauge Circuits and recording instruments, Strain Gauge Rossetes analysis, Stress Gauge. Photoelasticity methods - behaviour of light, plane polarized and circular polariscope, isochromatic and isoclinic fringe patterns for two dimensional photoelasticity, three dimensional photoelasticity, model slicing and shear difference method, birefringent coating method. Introduction to brittle coating method and Moire Fringe technique.

#### *Textbooks/References:*

- [1] J. W. Dally and W. P. Riely, *Experimental Stress Analysis*, McGraw-Hill Book Co.
- [2] L. S. Srinath, M. R. Raghavan, *Experimental Stress Analysis*, Tata McGraw-Hill.
- [3] A. W. Hendry, *Elements of Experimental Stress Analysis*, Pergamon Press.