

# Engineering Mechanics Lab / LAB-II

## EXPERIMENTS

### Strength of Materials

- **Modulus of Elasticity and Poisson's ratio**
- **Modulus of Rigidity of a Circular Shaft**
- **Stress State Analysis**
  - Eccentric specimen in tensile loading
  - Curved bar in diametrically concentrated tensile loading
  - Hollow circular shaft in torsion
- **Mode of Deformation**
  - Hollow circular shaft in torsion
  - L-Beam/Verification of Reciprocal theorem
  - Cantilever beam in oblique bending
  - Cantilever beam with concentrated load
  - Uniformly loaded solid circular plate
  - Thin walled cylinder subjected to internal pressure
- **Verification of Reciprocal Theorem of Work**
- **Normal Stress Distribution**
  - Plate with a circular hole in center
- **Statically indeterminate Loading**
- **Determination of Position of Shear Center**
- **Stability of Axially Compressed Strut**
- **Stress Distribution in Pure Bending**

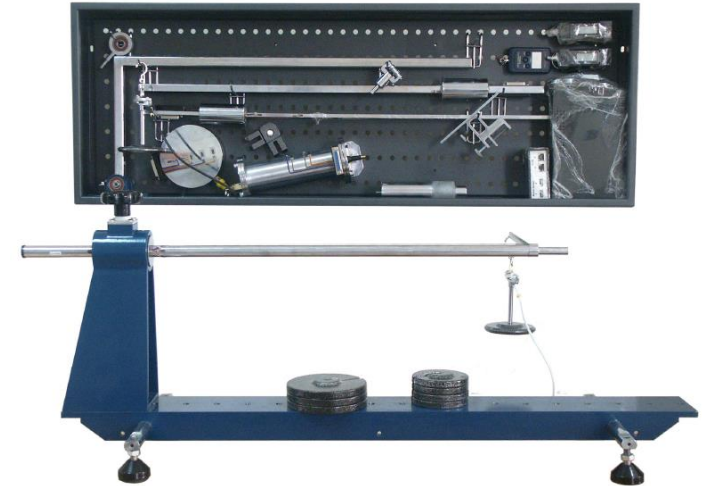
### Machine Health Monitoring

- **Introduction to Signal Processing**
- **Acquisition of Signals**
- **Fundamentals of Vibration**
- **Shaft Balancing & Bearing Faults**
- **Voltage and Current Waveforms**
- **Phasor Diagrams**
- **Power Fundamentals and Calculations**
- **Harmonics**
- **Temperature Monitoring**

This laboratory course introduces students to the concepts of Strength of Materials and Machine Health Monitoring. It develops physical understanding through experimentation as students analyze raw data and organize the results into a comprehensive lab report.

### Major Equipment

- **Data Acquisition LabVIEW Based Platform**
- **Strength of Materials Test Bench**
- **Machine Health Monitoring**



Strength of Materials Workbench



Machine Health Monitoring Setup