EXPERIMENTAL METHODS IN STRUCTURL ENGINEERING

2-0-3-0-9

Similitude and Structural Models: Dimensional analysis, Buckingham's Pi theorem, Scale factors and dynamic similitude; Uses and Applications of Models: Types of model investigation, Indirect and direct models, Elastic and Inelastic Models (steel, concrete and masonry), size effects Analysis of Experimental Data: Error and uncertainty in experiment, Measurement systems, Accuracy in models and reliability of results.Test Planning, Design and Implementation: Testing sequence and experimental plan, Loading systems, devices, actuators and their control, etc.Instrumentation: Mechanical, electrical, electronic system and their calibration, various types of sensors for displacement, velocity, acceleration, pressure, loads, strains, etc, fullfield measurements, Data Acquisition System and Data Processing: Analog systems, digital systems using personal computers, dynamic measurement, numerical and graphical data processing and archiving Lab Exercises: Experiments to illustrate buckling of structural members; load deformation behaviour of beams, columns, joints, and fiames under various loads; mode shapes, natural frequency, damping factors fiom free and forced vibrations, shake table tests, etc.