IFS ACADEMY

Training For The Future!!

Finite Element Analysis using MATLAB & ANSYS

(As per revised syllabus of Savitribai Phule Pune University Elective IV (BE-Mechanical) 2012 Course)

Course Curriculum (2 Days (8 Hrs / Day))

Chapter 1: Introduction to Finite Element Method

a. What is the Finite Element Method?
b. General Steps of the Finite Element Method
c. Explanation of 1D, 2D and 3D Elements
d. Enlisting different FEM methods and detailed explanation of any one
e. Derivation of stiffness matrix equation
f. Steady State Heat Transfer
g. Dynamic Analysis

Chapter 2: Fundamentals of MATLAB

a. The MATLAB Windows
b. Entering Expressions
c. Creating Variables
d. Functions
e. Matrix Algebra with MATLAB
f. Solution of system of linear equations
g. Strings in MATLAB
h. Programming with MATLAB
i. Basic Graphics

Chapter 3: ANSYS Mechanical APDL

a. ANSYS Mechanical APDL GUI
b. Steps in performing FEA using ANSYS Mechanical APDL
c. Static Structural Analysis
d. Modal Analysis
e. Heat Transfer Analysis
f. Workshops & Assignments

Chapter 4: ANSYS Workbench

a. ANSYS Workbench Project Window
b. Steps in performing FEA using ANSYS Workbench
c. Static Structural Analysis
d. Modal Analysis
e. Heat Transfer Analysis
f. Workshops & Assignments

Chapter 5: Workshops / Assignments

MATLAB Assignments:

a. Computer program for stress analysis 2-D truss subjected to plane forces
b. Computer program for modal analysis 1-D beam (simply supported or cantilever beams)
c. Computer program for frames subjected to transverse forces and moments
d. Computer program for 1-D temperature analysis

ANSYS Assignments:

e. Static stress concentration factor calculation for a plate with center hole subjected to axial loading in tension using FEA software.
f. 2D Forced convection problem using FEA software.
g. Modal analysis of any machine component using FEA software.
h. Stress and deflection analysis of any machine component consisting of 3-D elements using FEA software.

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