IFS ACADEMY

Training For The Future!!

Finite Element Analysis using

ANSYS Mechanical APDL

Course Curriculum (Duration: 70 Hrs.)

Chapter 1: Before you start using ANSYS
a.   Introduction to the Finite Element Method
b.   What is the Finite Element Method?
c.   History
d.   General Steps of the Finite Element Method
e.   Explanation of 1D, 2D and 3D Elements with examples of ANSYS Elements
f.   Need of FEM
g.   Enlisting different FEM methods and detailed explanation of any one
h.   Derivation of stiffness matrix equation
i.   Types of analysis that can be done using ANSYS
j.   Advantages of the Finite Element Method
k.   Limitations of FEA
l.   About ANSYS Inc.
m.   ANSYS Family of products with their capabilities
n.   Introduction to the ANSYS GUI
o.   Operation Modes of ANSYS
p.   Product Launcher
q.   Launcher Tasks
r.   Use Custom Memory Settings
s.   Launcher Menu Options
t.   The ANSYS GUI
u.   The Icon Toolbar Menu
v.   Quitting Ansys

Chapter 2: Selection Logic
a.   Plotting
b.   Pan-Zoom-Rotate
c.   Picking
d.   Coordinate Systems
e.   Select Logic

Chapter 3: Solid Modeling
a.   An Overview of Solid Modeling Operations
b.   Working with Boolean operations
c.   Working Plane
d.   Importing of 3D models

Chapter 4: Meshing
a.   Free meshing or Mapped meshing
b.   Setting Element Attributes
c.   Selecting Element Type
d.   Shape Function
e.   Defining Element Types
f.   Real Constants
g.   Defining Section Properties
h.   Assigning Element Attributes before meshing
i.   Mesh Controls
j.   The ANSYS MeshTool
k.   Smartsizing
l.   Meshing
m.   Free Meshing

n. Mapped Meshing
o. Hybrid meshing
p. Mesh Extrusion
q. Volume Sweeping

Chapter 5: Material Properties
a. Material Library
b. Specifying properties

Chapter 6: Boundary Conditions
a. Types of Loads
b. Applying loads

Chapter 7: Solvers
a. Types of Solvers
b. Solver Setup
c. Load Step Options
d. Solving Multiple Load Steps

Chapter 8: Post-processing
a. Contour Plot Viewing
b. Path Operations
c. Estimating Solution Error
d. Time History Postprocessor (POST26)
e. Report Generator

Chapter 9: Static Structural Analysis
a. Workshops, Exercises and Case Studies

Chapter 10: Modal Analysis
a. Workshops, Exercises and Case Studies

Chapter 11: Thermal Analysis
a. Workshops, Exercises and Case Studies

Chapter 12: Introduction to Non-Linear Analysis

Chapter 13: Tips & Tricks
a. Using the Toolbar & Creating Abbreviations
b. Introduction to APDL
c. Using Parameters
d. Using the Start File
e. Using the Session Editor
f. Using Input Files

Chapter 14: Coupling & Constraint Equations
a. Coupling
b. Constraint Equations
c. Workshops

Chapter 15: Beam Modeling
a. Beam properties
b. Beam meshing
c. Loading, Solution & Results

Chapter 16: Macro Basics
a. Creating a Macro
b. Macro with Arguments
c. Branching
d. Looping
e. General guidelines
f. Workshop

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