ANSYS Course Duration: One Week

Day 1 - Fundamentals of Stength of Materials and FEM

Session 1:

Overview of FEM

    FEA Model Entities (Nodes and Elements)

Strength of Materials

    Stiffness and Strength

    Plane stress, Plane strain, Stiffness Matrix

    Stiffness Method and Flexibility Method

ANSYS Products

    Overview of Boundary conditions,

    General analysis procedure.

    Introduction to ANSYS and Basic usage.

Workshops

    ANSYS GUI

    Memory management.

    Picking and plotting.

    Coordinate systems.

    Logic picking and component manager

Session 2:

    Demonstrations of 1D Elements.

    General procedure for Link and Beam Modeling

    General Procedure for Meshing

    General Procedure for Post processing

    Solving UDL and UVL Problems

    Resolving Loads

    Finding SFD and BMD

Day 2 - Solving Basic Linear Static Structural Analysis

Session 3:

Introduction to 2D Elements

    2D Element Behavior

        Plane Stress

        Plane Strain

        Axisymmetry

    General procedure for Modeling, Loading and Post processing

Workshops

    Working with Symmetry BC's

Session 4:

Introduction to 3D Elements

    Modeling Options

    Glue

    Overlap and other Boolean operations

    Working with Co-ordinate system (Local, Global and User defined)

    Importing Solid Models

Workshops

    Creating Solid Model

Day 3 - Finite Element Modeling

Session 5:

    Creating finite element models (meshing).

    Element attributes

    Mesh controls

    Generating Mesh

    Free mesh

    Mapped Mesh

    Sweep Mesh

Session 6:

    Preparing Models for Mesh

    Mesh Import

    Meshing Workshop

Day 4 - Introduction to Dynamic Analysis

Session 7:

    Overview of FEM applied to Basic Dynamics.

    Modal analysis.

    General procedure for Loading and Post processing

    Workshops.

Session 8:

    Harmonic analyses

    Transient analyses

    Workshops

Day 5 - Introduction to Thermal Analysis

Session 9:

    Overview of Basic Heat transfer.

    Elements used in Thermal Analysis

    Loads and BC's

    Solution of Conduction problems.

    Solution of Convection problems.

    Workshops.

Session 10:

    Introduction to Multiphysics Analysis

    Solving Thermal – Structural problems (Coupled field analysis).

    Workshops.

Summary and Case studies

Effect of Pre-stress on natural frequency for an impeller (Pre stressed Modal analysis).

Heat transfer analysis on Heat sinks.

Stress analysis of a Hydraulic Press frame.

Fatigue life calculations on a connecting rod.

Questions & Answers.

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