



TEST & OPTIMISATION LAB

NITW SIEMENS CENTRE OF EXCELLENCE, NIT WARANGAL

Course Name: Simcenter 3D Pre/Post (Intermediate Course)

Course Duration: 40 Hrs.

Course overview:

- Intended Audience:
 - Design engineers and analysts who want to learn the details of how to perform finite element analysis using Simcenter 3D.
- Prerequisites.
 - Education: Diploma, B.E/B.Tech. 2nd year completed in any one of the following streams: Mechanical/Civil/Design/Automotive/Aerospace
 - Software: NX Basics/Designing Parts in NX.
- Course objectives
 - This course introduces the Simcenter 3D Pre/Post (Engineering Desktop) product, which provides finite element modeling and results visualization. It covers the details of the finite element analysis (FEA) processes including preparing geometry, meshing, applying boundary conditions, checking the model, solving, and post-processing the results.
 - After successfully completing this course :
 - Students will know the basics of software operation, Finite Element Analysis.
 - Student will gain the knowledge on Pre/post analysis using Simcenter 3d
- Course contents
 - 1) Fundamentals of using Pre/Post (8 hrs.)**
 - a. Analyzing models in Simcenter 3D Pre/Post.
 - b. Managing analysis data in Simcenter 3D Files.
 - c. Using Pre/Post features to work with Models.
 - 2) Preparing the Model for Analysis (8 hrs.)**
 - a. Preparing Geometry for Analysis.
 - b. Meshing a Model:
 - I. Selecting a Mesh and Element Type
 - II. Creating a Mesh
 - III. Using Mesh Collectors to Organize the Model
 - IV. Defining Material Properties for a Mesh
 - V. Creating a 3D Hexahedral Mesh
 - VI. Splitting Complex Bodies for Hexahedral Meshing
 - VII. Creating a 2D Mesh/ 2D Mapped Mesh
 - VIII. Creating a 1D Mesh
 - IX. Controlling the Mesh Display
 - X. Editing Meshes with Manual Mesh Techniques



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- XI. Controlling Mesh Density
- XII. Setting Element Size and Surface Curvature
- XIII. Lab Solution: Creating a Structured Mesh
- c. Modelling Connections/Assemblies.
- d. Applying boundary conditions.

3) Solving the Model (8 hrs.)

- a. Setting Up and Running a Structural Analysis: Learn how to set up and run a Nastran solve, from Simcenter 3D Pre/Post.
 - I. Using Solutions and Subcases
 - II. Creating Solutions and Subcases
 - III. Defining Solution Attributes
 - IV. Setting Solver Parameters
 - V. Solving the Model
 - VI. Dealing with Common Warnings from the Solve
 - VII. Determining the Validity of Results

4) Reviewing Analysis Results (8 hrs.)

- a. Displaying Results in Post Views: Learn how to generate results displays in post views.
 - I. Displaying Results Overview
 - II. Displaying Results in Post Processing
 - III. Displaying Results in a Post View
 - IV. Controlling Visibility in Post Views
 - V. Displaying Results in Multiple Viewports
 - VI. Animating Results
 - VII. Annotating Results
 - VIII. Displaying More Results in Post Processing
 - IX. Displaying Stress/Strain Results on 2D Elements
 - X. Calculating and Displaying Beam Stresses
 - XI. Displaying Symmetry Results in a Post View
 - XII. Displaying Results in the Results Viewer
 - XIII. Lab Solution: Displaying Results in Post Views

5) Processes and Solutions (8 hrs.)

- a. Introduction to Thermal Analysis: Learn how to set up and run a thermal analysis.
 - II. Thermal Analysis Overview
 - III. Setting Up and Solving a Thermal Analysis.
- b. Geometry Optimization: Learn how to use geometry optimization to optimize model design.
 - I. Geometry Optimization Overview
 - II. Geometry Optimization Workflow