



SOLIDWORKS SIMULATION ESSENTIALS

PREREQUISITES	LENGTH	DESCRIPTION
<ul style="list-style-type: none"> ■ Knowledge of SolidWorks and basic mechanical engineering concepts is required. <p>► INTRODUCTION TO FEA</p> <ul style="list-style-type: none"> ■ What is SolidWorks simulation, Finite Element Analysis? ■ Build Mathematical, Finite Element Mode ■ Solve Finite Element Mode ■ Degrees of Freedom, Units of Measurement ■ Calculations, Interpretation, Errors in FEA ■ Limitations of SolidWorks Simulation <p>► THE ANALYSIS PROCESS</p> <ul style="list-style-type: none"> ■ Stress in a Plate ■ SolidWorks Simulation Options ■ Pre-processing, Meshing, Post-processing ■ Multiple Studies ■ Reports <p>► MESH CONTROLS, STRESS CONCENTRATIONS & BOUNDARY CONDITIONS</p> <ul style="list-style-type: none"> ■ The L Bracket ■ Analysis of Bracket with a Fillet ■ Analysis of a Welded Bracket ■ Understanding the Effect of Boundary Conditions <p>► ASSEMBLY ANALYSIS WITH CONTACTS</p> <ul style="list-style-type: none"> ■ Contact Analysis ■ Pliers with Local, Global Contact 	<p>3 Days</p>	<ul style="list-style-type: none"> ■ This course will provide an in-depth coverage on the basics of Finite Element Analysis (FEA), covering the entire analysis process from meshing to evaluation of results for parts and assemblies. <p>► SYMMETRICAL & FREE SELF-EQUILIBERATED ASSEMBLIES</p> <ul style="list-style-type: none"> ■ Shrink Fit Parts ■ Analysis with Soft Springs <p>► ASSEMBLY ANALYSIS WITH CONNECTORS</p> <ul style="list-style-type: none"> ■ Connecting Components ■ Case Study: Vise Grip Pliers <p>► COMPATIBLE/INCOMPATIBLE MESHES</p> <ul style="list-style-type: none"> ■ Compatible/Incompatible Meshing ■ Case Study: Rotor <p>► ASSEMBLY ANALYSIS MESH REFINEMENT</p> <ul style="list-style-type: none"> ■ Mesh Control in an Assembly ■ Cardan Joint ■ Draft Quality Coarse Mesh Analysis, High Quality Mesh Analysis <p>► ANALYSIS OF THIN COMPONENTS</p> <ul style="list-style-type: none"> ■ Mesh with Solid Elements, Refined Solid Mesh ■ Solid vs. Shell ■ Creating Shell Elements ■ Shell Elements - Mid-Plane surface ■ Results Comparison ■ Case Study: Joist Hanger, Pulley



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► MIXED MESHING SHELLS & SOLIDS

- Mixed Meshing Solids and Shells
- Case Study: Pressure Vessel

► MIXED MESHING SOLIDS, BEAMS & SHELLS

- Mixed Meshing
- Case Study: Particle Separator

► DESIGN SCENARIOS

- Suspension Design
- Multiple Load Cases
- Geometry Modification

► THERMAL STRESS ANALYSIS

- Bimetallic Strip
- Examining Results in Local Coordinate Systems
- Saving Model in its Deformed Shape

► ADAPTIVE MESHING

- Support Bracket
- h-Adaptivity, p-Adaptivity Study
- h vs. p Elements - Summary

► LARGE DISPLACEMENT ANALYSIS

- Small vs. Large Displacement Analysis
- Small Displacement Linear Analysis
- Large Displacement Nonlinear Analysis
- Case Study: Clamp

► MESHING, SOLVERS TIPS & TRICKS

- Meshing Strategies
- Geometry Preparation
- Mesh Quality, Controls
- Meshing Stages
- Failure Diagnostics
- Tips for Using Shell Elements
- Hardware Considerations in Meshing
- Solvers in SolidWorks Simulation
- Choosing a Solver