SIMULATION PREMIUM: NONLINEAR

Pre-Requisites: SOLIDWORKS Simulation (Required), SOLIDWORKS Simulation Professional (Recommended)

Daily Schedule: 8:30 a.m. - 4:30 p.m.

Length: 2 Days

This class will raise your SOLIDWORKS Simulation FEA skills to the next level! It offers hands-on experience on the use of the SOLIDWORKS Simulation Premium non-linear module. The two-day course provides an overview on a wide range of non-linear structural/mechanical analysis topics.

You will learn how to deal with models that exhibit large displacements and/or yielding, discuss and practice the use of many material models available in SOLIDWORKS Simulation and, most importantly, how to drive a non-linear analysis to successful completion.

Introduction: Nonlinear Structural Analysis

- » Introduction
- » Types of Nonlinearities
- » Solving Nonlinear Problems
- » Geometric Nonlinear Analysis
- » Material Models and Constitutive Relations
- » Numerical Procedures for Nonlinear FEA
- » Contact Analysis

Lesson 1: Large Displacement Analysis

- » Objectives
- » Case Study: Hose Clamp
- » Linear Static Analysis
- » Nonlinear Static Analysis
- » Linear Static Study (Large Displacement)

Lesson 2: Incremental Control Techniques

- » Objectives
- » Incremental Control Techniques
- » Case Study: Trampoline
- » Linear Analysis
- » Nonlinear Analysis – Force Control
- » Nonlinear Analysis – Displacement Control

Lesson 3: Nonlinear Static Buckling Analysis

- » Objectives
- » Case Study: Cylindrical Shell
- » Linear Buckling
- » Linear Static Study
- » Nonlinear Symmetrical Buckling
- » Nonlinear Asymmetrical Buckling
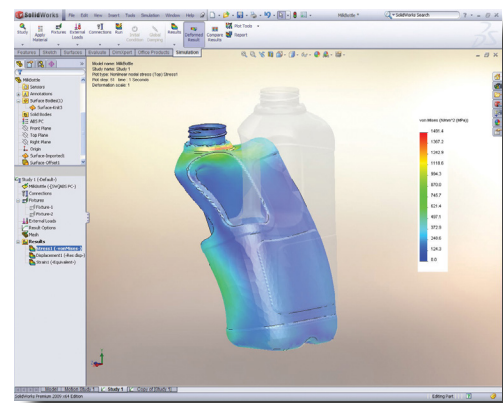
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Lesson 4: Plastic Deformation

- » Objectives
- » Plastic Deformation
- » Case Study: Paper Clip
- » Linear Elastic
- » Nonlinear – Von Mises
- » Nonlinear – Tresca

Lesson 5: Hardening Rules

- » Objectives
- » Hardening Rules
- » Case Study: Crank Arm
- » Isotropic Hardening
- » Kinematic Hardening

Lesson 6: Analysis of Elastomers

- » Objectives
- » Case Study: Rubber Pipe
- » 2 Constant Mooney-Rivlin (1 Material Curve)
- » 2 Constant Mooney-Rivlin (2 Material Curve)
- » 2 Constant Mooney-Rivlin (3 Material Curve)
- » 6 Constant Mooney-Rivlin (3 Material Curve)

Lesson 7: Nonlinear Contact Analysis

- » Objectives
- » Case Study: Rubber Tube
- » Instability in Assemblies
- » Stabilization
- » Validity and Limitations of Static Analysis

Lesson 8: Metal Forming

- » Objectives
- » Bending
- » Case Study: Sheet Bending