CADIMENSIONS

SOLIDWORKS Simulation Premium: Nonlinear

Length: 2 days

Prerequisite: SOLIDWORKS Simulation

Description: SOLIDWORKS Simulation Premium Nonlinear teaches 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.

Course Syllabus

Introduction

- About This Course
- What is SOLIDWORKS Simulation?
- More SOLIDWORKS Training Resources

Introduction to Nonlinear Structural Analysis

- Introduction
- Types of Nonlinearities
- Solving Nonlinear Problems

Geometric Nonlinear Analysis

- Introduction
- Small Displacement Analysis
- Large displacements Analysis
- Finite Strain Analysis
- Large Deflection Analysis
- References

Material Models and Constitutive Relations

- Introduction
- Elastic Models
- Elasto-Plastic Models
- Super Elastic Nitinol Model
- Linear Visco-Elastic Model
- Creep Model
- References

Numerical Procedures for Nonlinear FEA

- Overview
- Incremental Control Techniques
- Iterative Methods
- Termination Criteria
- References

Contact Analysis

- Introduction
- Global Contact / Gap Conditions
- Local Contact / Gap Conditions
- Troubleshooting for Gap / Contact Problems
- References

Lesson 1: Large Displacement Analysis

- Objective
- Case Study: Hose Clamp
- Problem Statement
- Linear Static Analysis
- Nonlinear Static Study
- Linear Static Study (Large Displacement)
- Summary/Questions

Lesson 2: Incremental Control Techniques

- Objective
- Incremental Control Techniques
- Case Study: Trampoline
- Project Description
- Linear Analysis
- Nonlinear Analysis – Force Control
- Nonlinear Analysis – Displacement Control
- Summary/Questions

Lesson 3: Nonlinear Static Buckling Analysis

- Objective
- Case Study: Cylindrical Shell
- Problem Statement
- Linear Buckling
- Linear Static Study
- Nonlinear Symmetrical Buckling

- Nonlinear Asymmetrical Buckling
- Summary/Questions

Lesson 4: Plastic Deformation

- Objective
- Plastic Deformation
- Case Study: Paper Clip
- Problem Statement
- Linear Elastic Nonlinear – von Mises
- Nonlinear – Tresca's
- Stress Accuracy
- Elastic Material
- Summary/Questions

Lesson 5: Hardening Rules

- Objective
- Hardening Rules
- Case Study: Crank Arm
- Problem Statement
- Isotropic Hardening
- Summary/Questions

Lesson 6: Analysis of Elastomers

- Objective
- Case Study: Rubber Pipe
- Problem Statement
- Two 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)
- Summary/Questions

Lesson 7: Nonlinear Contact Analysis

- Objective
- Case Study: Rubber Tube
- Problem Statement
- Summary/Questions

Lesson 8: Metal Forming

- Objective
- Bending
- Case Study: Sheet Bending
- Problem Statement
- Questions

Appendix A: True and Engineering Stress and Strain

- Engineering Stress and Strain
- True Stress and Strain
- References

CADIMENSIONS IS A SOLIDWORKS CERTIFED TRAINING CENTER

CADIMENSIONS TRAINING CATALOG