

# SOLIDWORKS Simulation Professional

**Length: 2 Days**

**Prerequisite:** SOLIDWORKS Simulation

**Description:** SOLIDWORKS Simulation Professional is designed to make SOLIDWORKS Simulation users more productive with the SOLIDWORKS Simulation Professional extension. This course will provide an in-depth coverage on the advanced topics in Finite Element Analysis (FEA), including heat transfer analysis, frequency analysis, fatigue, stability analysis based on the linear buckling concepts, 2D simulations (plan stress, strain and axisymmetry) and pressure vessel modulus.

## Course Syllabus

### Introduction

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

### Lesson 1 – Frequency Analysis of Parts

- Objectives
- Modal Analysis Basics
- Case Study: The Tuning Fork
- Project Description
- Frequency Analysis With Supports
- Frequency Analysis Without Supports
- Frequency Analysis With Load
- Summary
- Questions

### Lesson 2 – Frequency Analysis of Assemblies

- Objectives
- Case Study: The Engine Mount
- Project Description
- All Bonded Contact Conditions
- Bonded and Allow Penetration Contacts
- Summary
- Questions

### Lesson 3 - Buckling Analysis

- Objectives
- Buckling Analysis
- Case Study: Particle Separator

- Project Description
- Summary Questions

### Lesson 4 - Load Cases

- Objectives
- Load Cases
- Case Study: Scaffolding

### Lesson 5 - Submodeling

- Objectives
- Submodeling
- Case Study: Scaffolding
- Part 1: Parent Study
- Part 2: Child Study
- Summary
- Questions

### Lesson 6 - Topology Analysis

- Objectives
- Topology Analysis
- Case Study: Rear Bike Shock Link
- Project Description
- Goals and Constraints
- Manufacturing Controls
- Mesh Effects
- Load Cases in Topology Studies
- Export Smoothed Mesh
- Summary

### Lesson 7 - Thermal Analysis

- Objectives

TOMORROW IS DESIGNED **TODAY.**

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- Thermal Analysis Basics
- Case Study: Microchip Assembly
- Project Description
- Steady-State Thermal Analysis
- Transient Thermal Analysis
- Transient Analysis with Varying Time Varying Load
- Transient Thermal Analysis using a Thermostat
- Summary
- Questions

### **Lesson 8 - Thermal Analysis with Radiation**

- Objectives
- Case Study: Spot Light Assembly
- Project Description
- Steady State Analysis
- Summary

### **Lesson 9 - Advanced Thermal Stress2D Simplification**

- Objectives
- Thermal Stress Analysis
- Case Study: Metal Expansion Joint
- Project Description
- Thermal Analysis
- Thermal Stress Analysis
- 3D Model
- Summary
- Questions
- Microchip Testing Assembly
- Thermoelectric Cooler

### **Lesson 10 - Fatigue Analysis**

- Objective
- Fatigue
- Stress-Life (S-N) Based Fatigue
- Case Study: Pressure Vessel
- Thermal Study
- Thermal Stress Study
- Fatigue Terminology
- Fatigue Study
- Fatigue Study with Dead Load

- Summary
- Questions

### **Lesson 11 – Variable Amplitude Fatigue**

- Objectives
- Case Study: Suspension
- Project Description
- Fatigue Study
- Summary
- Questions

### **Lesson 12 - Drop Test Analysis**

- Objectives
- Drop Test Analysis
- Case Study: Camera
- Project Description
- Rigid Floor Drop Test
- Elastic Floor, Elasto-Plastic Material
- Elasto-Plastic Material Model
- Drop Test with Contact
- Summary

### **Lesson 13 - Optimization Analysis**

- Objectives
- Optimization Analysis
- Case Study: Press Frame
- Project Description
- Static and Frequency Analyses
- Design Study
- Summary

### **Lesson 14 – Pressure Vessel Analysis**

- Objectives
- Case Study: Pressure Vessel
- Project Description
- Pressure Vessel Analysis
- Manhole Nozzle Flange and Cover
- Summary





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