About This Course

The goal of this course is to teach you how to use the SOLIDWORKS Simulation software to help you analyze linear and nonlinear dynamic* structural behavior of your SOLIDWORKS part and assembly models.

The focus of this course is on the advanced skills and concepts central to the successful use of SOLIDWORKS Simulation Premium: Dynamics modulus. You should view the training course manual as a supplement to, and not a replacement for, the system documentation and on-line help. Once you have mastered your basic skills and developed a good foundation in advanced skills, you can refer to the on-line help for information on less frequently used command options.

Prerequisites

Students attending this course are expected to have the following:

- Mechanical design experience.
- Experience with the Windows™ operating system.
- Completed the on-line SOLIDWORKS tutorials that arc available under Help. You can access the on-line tutorials by clicking Help, Online Tutorial.
- Basie knowledge of SOLIDWORKS Simulation software discussed and practised during the basic training courses.
- Knowledge of basic concepts in Finite Element Analysis discussed during the basic SOLIDWORKS Simulation training courses.
- Completed the on-line SOLIDWORKS Simulation tutorials (except those relating to nonlinear analysis) that arc available under Help. You can access the on-line tutorials by clicking Help,
- Online Tutorial.

Course Design Philosophy

This course is designed around a process- or task-based approach to training. Rather than focusing on individual features and functions, a process-based training course emphasizes processes and procedures you should follow to complete a particular task. By utilizing ease studies to illustrate these processes, you learn the necessary commands, options and menus in the context of completing a design task.

Course Length

The minimum recommended length of this course is two days.

Lesson 1: Vibration of a Pipe

- Objectives
- Problem Description
- Static Analysis
- Frequency Analysis
  - Discussion
- Dynamic Analysis
- (Slow Force)
  - Linear Dynamic Analysis
- Discussion
- Dynamic Analysis
- (Fast Force)
- Summary
- Questions

Lesson 2:
Transient Shock Analysis According to MILS-STD-810G

- Objectives
- Problem Description
  - Mass Participation Factor
  - Cumulative Mass Participation Factor.
  - Damping
  - Viscous Damping
  - Time Step
- Model with Remote Mass
  - Remote Mass
- Summary
- Questions

Lesson 3:
Harmonic Analysis of a Bracket

- Objectives
- Project Description
  - Harmonic Analysis Basics
  - Single DOF Oscillator
- Harmonic Analysis of a Bracket
  - Harmonic Study Properties
- Summary
- Questions

Lesson 4:
Response Spectrum Analysis

- Objectives
- Response Spectrum Analysis
- Response Spectrum
  - Response Spectrum Analysis Procedure
- Project Description
  - Response Spectrum Input
  - Mode Combination Method
- Summary
- Questions

Lesson 5:
Random Vibration Analysis According to MIL-STD-810G

- Objectives
- Project Description
  - Distributed Mass
  - Random Vibration Analysis
  - Power Spectral Density Function
  - Overall Level of Acceleration PSD
  - Decibels
  - Random Study Properties
  - Advanced Options
  - RMS Results
  - PSD Results
  - Is, 2s, 3s, ... Results
- Summary
- References
- Questions
- Exercise 1:
  Random Vibration Analysis of an Electronics Enclosure
- Exercise 2:
  Circuit Board Fatigue Estimates

Lesson 6:
Random Vibration Fatigue

- Objectives
- Project Description
  - Random Vibration Fatigue
  - Material Properties, S-N Curve
  - Random Vibration Fatigue Options
- Summary

Lesson 7:
Nonlinear Dynamic Analysis of an Electronic Enclosure