SOLIDWORKS Motion Training

Prerequisites: Mechanical design experience; experience with the Windows® operating system.

Description: Designed for users who would like to become productive quickly in using SOLIDWORKS Motion. This 2 day course will teach you how to use the SOLIDWORKS Motion simulation package to study the kinematics and dynamic behavior of your SOLIDWORKS assembly models.

Who should attend: This course has been designed for new SOLIDWORKS Motion users who would like to learn to perform motion analysis on their designs. The course provides an in-depth session on the basics of building, simulating and refining a mechanical design system.

Length: 2 Days

Introduction
- About This Course
- More SOLIDWORKS Training Resources
- What is SOLIDWORKS Motion?
- Understanding Basics
- Basics of Mechanism Setup in SOLIDWORKS Motion

Lesson 1:
Introduction to Motion Simulation and Forces
- Objectives
- Basic Motion Analysis
- Case Study: Car Jack Analysis
- Forces
- Results

Lesson 2:
Building a Motion Model and Post-processing
- Objectives
- Creating Local Mates
- Case Study: Crank Slider Analysis
- Mates
- Local Mates
- Power
- Plotting Kinematic Results

Lesson 3:
Introduction to Contacts, Springs and Dampers
- Objectives
- Contact and Friction
- Case Study: Catapult
- Contact
- Contact groups
- Contact Friction
- Translational Spring
- Translational Damper
- Post-processing
- Analysis with Friction (Optional)

Lesson 4:
Advanced Contact
- Objectives
- Contact Forces
- Case Study: Latching Assembly
- STEP Function
- Contact: Solid Bodies
- Geometrical Description of Contacts
- Integrators
- Instability Points
- Modifying Results Plots
- Path Math Motor

Lesson 5:
Curve to Curve Contact
- Objectives
- Contact Forces
- Case Study: Geneva Mechanism
- Curve to Curve Contact
- Solid bodies vs. curve to curve contact
- Solid Bodies Contact Solution

Lesson 6:
CAM Synthesis
- Objectives
- CAMs
- Case Study: CAM Synthesis
- Trace Path
- Exporting Trace Path Curves

Lesson 7:
Motion Optimization
- Objectives

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- Motion Optimization
- Case Study: Medical examination chair
- Sensors
- Optimization Analysis

Lesson 8:
Flexible Joints
- Objectives
- Flexible Joints
- Case Study: System with rigid Joints
- System with Flexible Joints

Lesson 9:
Redundancies
- Objectives
- Redundancies
- Case Study: Door Hinges
- How to Check for Redundancies
- Typical Redundant Mechanisms

Lesson 10:
Export to FEA
- Objectives
- Exporting Results
- Case Study: Drive Shaft
- Export of Loads
- Direct Solution in SOLIDWORKS Motion

Lesson 11:
Event Based Simulation
- Objectives
- Event Based Simulation
- Case Study: Sorting Device
- Servo motors
- Sensors
- Task

Lesson 12:
Design Project (Optional)
- Objectives
- Design Project
- Case Study: Surgical Shear – Part 1
- Self Guided Problem – Part 1
- Self Guided Problem – Part 2
- Problem Solution – Part 1
- Creating the Force Function
- Force Expression
- Case Study: Surgical Shear – Part 2

Appendix A:
Motion Study Convergence Solutions and Advanced Options
- Convergence
- Accuracy
- Integrator Type
- Integrator Settings
- Conclusion

Appendix B:
Mate Friction
- Concentric (Spherical) Mate Friction Model
- Coincident Translational Mate Friction Model
- Concentric Mate Friction Model
- Coincident Mate (Planar) Friction Model
- Universal Joint Friction Model
- Friction Results Reported

*Subjected to changes