SOLIDWORKS MOTION

Duration : 2 days
Time : 9:00am – 5:00pm
Methodology : Practical case study models using computers, lecturing, discussions and case studies
Target : R&D engineer
Product designer or engineer
Objective : This course will introduce the participants to the motion simulation for mechanism study. This will include:

- Learning the difference between kinematic and dynamic mechanical system.
- Learn and apply different joint constraints to demonstrate how components are move relative to each other.
- Add common mechanism component such as spring, damper, bushing and etc to evaluate the required force input.
- Learn to evaluate the both the mechanism inputs and outputs such as torque, displacement, velocity, acceleration and etc with respect with time.
Course Outline:

Day 1:
Lesson 1: Introduction to Motion Simulation and Forces
- Use Assembly Motion to animate the motion of a car jack assembly.
- Use SolidWorks Motion to simulate physical behavior of the car jack and determine the torque required to lift a vehicle.

Lesson 2: Building a Motion Model and Post-processing
- Build proper SolidWorks Motion models for kinematic simulation.
- Create local mates for a SolidWorks Motion study.
- Create and modify plots for post-processing.

Lesson 3: Introduction to Contacts, Springs and Dampers
- Check interference of components.
- Apply contact to components.
- Specify 3D contact friction.
- Add a spring with damper to the assembly.

Lesson 4: Latching Assembly
- Understand the definition as well as the description of contacts.
- Use expressions to prescribe the magnitude of forces and motors.
- Analyze some causes of the incorrect solution or a contact solutions failure.
- Use alternative numerical integrators.

Lesson 5: Curve to Curve Contact
- Understand the definition as well as the description of contacts.
- Use expressions to prescribe the magnitude of forces and motors.
- Analyze some causes of the incorrect solution or a contact solution failure.
- Use alternative numerical integrators.

Day 2:
Lesson 6: CAM Synthesis
- Use of a spline curve to control the motor.
- Create a trace path of a point to get the CAM profile.
- Create a SolidWorks part with this CAM profile.

Lesson 7: Flexible Joints
- Learn about Flexible connectors (Bushings).
- Create Advanced Plots.

Lesson 8: Redundancies
- Understand Redundancies and how they affect the simulation.
- Use Flexible mates to automatically remove redundancies in a mechanism.
- Understand how to build assemblies without redundancies.

Lesson 9: Export to FEA
- Create an Action Only Moment.
- Export loads from SolidWorks Motion to FEA Simulation.
- Run the structural analysis in SolidWorks Simulation.

Lesson 10: Event Based Simulation
- Understand and run event based simulation.
- Apply servo motors.
- Create events with specific timing and logic.
Lesson 11: Design Project (Optional)

- Create a function based force.
- Export loads to SolidWorks Simulation.
- Complete an analysis project from motion to FEA.