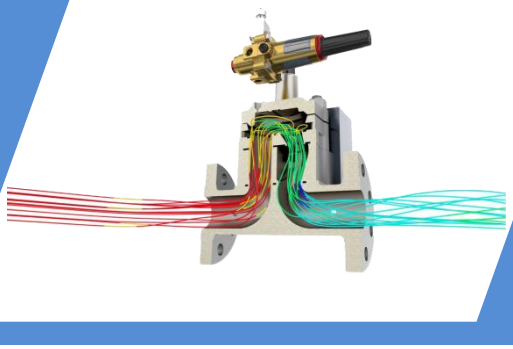

SOLIDWORKS FLOW SIMULATION

Who should attend:

Application Engineer
R&D Engineer
Product Designer or Engineer

Prerequisites:

- Mechanical Design Experience
- Attended SolidWorks Essentials
- Basic understanding in the field of fluid flow and heat transfer

Experience with the Windows™ Operating

System.Mechanical Design Experience

Duration:

2 Days

Methodology:

Practical hands-on with using computers, lecturing, discussions and case studies

Introduction

This course is designed for users who would like to become productive faster, this introductory course offers hands-on training on the use of SOLIDWORKS Flow Simulation. This course is to learn how to set up, run and view results of a fluid flow and /or heat transfer analysis.

Objective

This course will introduce the participants to computational fluid dynamic (CFD) analysis for fluid flow and heat transfer studies. This will include: -

- Learn to create fluid flow study with initial boundary conditions such as type of fluid & flow as well as initial boundary conditions.
- Interpret the different fluid flow results such as flow trajectories, section plots and etc to understand the flow analysis
- Learn to set up basic thermodynamic equation such as hydraulic loss to evaluate the fluid flow study.

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SOLIDWORKS FLOW SIMULATION

Key Topics

Day 1

Lesson 1: Creating a SOLIDWORKS Flow Simulation Project

- Understand the model preparations required for a Flow Simulation Project.
- Create simple lids.
- Check the geometry for invalid contacts.
- Check the internal fluid volume.
- Create a SolidWorks Flow Simulation Project using the Project Wizard.
- Apply flow boundary conditions.
- Apply Goals.
- Run an Analysis.
- Use the Solver Monitor window.
- View the results.

Lesson 2: Meshing

- Generate proper mesh in the presence of thin walls and narrow channels.
- Use mesh features.
- Display mesh.
- Use thin wall optimization feature.
- Apply manual mesh control and use control planes.
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Lesson 3: Thermal Analysis

- Use the Engineering Database for your materials.
- Apply heat loading.
- Learn to create a fan in your model.
- Use perforated plates.
- Understand Fan Curves.
- Model and electronics enclosure.
- Learn good modeling approaches to complicated geometry.

Lesson 4: External Transient Analysis

- Create a 2D plane flow analysis.
- Use the Reynolds number equation to apply a velocity boundary condition to an external analysis.
- Use the Solution Adaptive Mesh refinement option.
- Use animation techniques to visualize the results.
- Create a transient animation.

Lesson 5: Conjugate Heat Transfer

- Create a steady state conjugate heat transfer analysis for a cold plate using a real gas.
- Define multiple fluid regions.
- Use real gases.
- Create temperature plots in the solid and fluid regions.

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SOLIDWORKS FLOW SIMULATION

Key Topics

Day 2

Lesson 6: EFD Zooming

- Use EFD Zooming to solve complex models
- Properly apply transferred boundary conditions.

Lesson 7: Porous Media

- Create a flow analysis using the porous media option.
- Evaluate velocity profiles.
- Use the Component Control command.

Lesson 8: Rotating Reference Frames

- Set up problems using Rotating Reference Flow.

Lesson 9: Parametric Study

- Create an analysis using the Parametric (optimization) Study feature.
- Create a quarter model using symmetry planes.
- Properly post-process parametric analysis results

Lesson 10: Cavitation

- Select the cavitation flow type.
- Display cavitation results.

Lesson 11: Relative Humidity

- Apply Relative Humidity as a boundary condition.
- Display Relative Humidity results.

Lesson 12: Particle Trajectory

- Inject a physical particle into a flow stream.
- Use the Particle Study command.
- View particle trajectory results.

Lesson 13: Supersonic Flow

- Create an external supersonic flow analysis.
- Use the solution adaptive mesh feature for supersonic flows.
- Create contour plots of Mach Number.

Lesson 14: FEA Load Transfer

- Transfer flow results to SolidWorks Simulation for a finite element analysis
- Create a SolidWorks Simulation study using results from SolidWorks Flow Simulation as input boundary conditions.
- View results in SolidWorks Simulation.