

SOLIDWORKS Flow Simulation

Length: 2 Days

Prerequisite: SOLIDWORKS Essentials

Description: SOLIDWORKS Flow Simulation teaches the fundamental skills and concepts central to successfully performed CFD analysis. The techniques taught are widely used by designers analyzing devices that interact with fluid; such as vehicles, pumps, chemical apparatus and ventilation systems.

Course Syllabus

Introduction

- About This Course
- More SOLIDWORKS Training Resources

Lesson 1 – Creating a SOLIDWORKS Flow Simulation Project

- Objectives
- Case Study: Manifold Assembly
- Problem Description
- Model preparation
- Post-Processing
- Discussion
- Summary

Lesson 2 – Meshing

- Objectives
- Case Study: Chemistry Hood
- Project Description
- Computational Mesh
- Basic Mesh
- Initial Mesh
- Geometry Resolution
- Result Resolution/Level of Initial Mesh
- Control Planes
- Summary

Lesson 3 - Thermal Analysis

- Objectives
- Case Study: Electronics Enclosure
- Project Description
- Fans
- Perforated Plates
- Discussion

- Summary

Lesson 4 - External Transient Analysis

- Objective
- Case Study: Flow Around a Cylinder
- Problem Description
- Reynolds Number
- External Flow
- Transient Analysis
- Turbulence Intensity
- Solution Adaptive Mesh Refinement
- Two-Dimensional Flow
- Computational Domain
- Calculation Control Options
- Time Animation
- Discussion
- Summary

Lesson 5 - Conjugate Heat Transfer

- Objectives
- Case Study: Heated Cold Plate
- Project Description
- Conjugate Heat Transfer
- Real Gases
- Summary

Lesson 6 - EFD Zooming

- Objectives
- Case Study: Electronics Enclosure
- Project Description
- EFD Zooming
- Summary



**Lesson 7 - Porous Media**

- Objectives
- Case Study: Catalytic Converter
- Problem Statement
- Porous Media
- Design Modification
- Discussion
- Summary
- Additional Sheet Metal Functions

Lesson 8 - Rotating Reference Frames

- Objectives
- Rotating Reference Frame
- Part 1: Averaging
- Case Study: Table Fan
- Problem Description
- Noise Prediction
- Part 2: Sliding Mesh
- Case Study: Blower Fan
- Problem Description
- Tangential Faces of Rotors
- Time Step
- Summary

Lesson 9 - Parametric Study

- Objectives
- Case Study: Piston Valve
- Problem Description
- Parametric Analysis
- Steady State Analysis
- Part 1: Goal Optimization
- Part 2: Design Scenario
- Part 3: Multi Parameter Optimization
- Summary

Lesson 10 - Free Surface

- Objectives
- Case Study: Dam-Break Flow
- Problem Description
- Free Surface
- Experiential Data

- Summary
- References Theoretical Results

Lesson 11 - Cavitation

- Objectives
- Case Study: Cone Valve
- Problem Description Cavitation
- Discussion
- Summary

Lesson 12 - Relative Humidity

- Objectives
- Relative Humidity
- Case Study: Cook House
- Problem Description
- Summary

Lesson 13 - Particle Trajectory

- Objective
- Case Study: Hurricane Generator
- Problem Description
- Particle Trajectories – Overview
- Summary

Lesson 14 – Supersonic Flow

- Objectives
- Supersonic Flow
- Case Study: Conical Body
- Problem Statement
- Discussion
- Summary

Lesson 15 - REA Load Transfer

- Objectives
- Case Study: Billboard
- Problem Description
- Summary





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