SOLIDWORKS Routing: Piping and Tubing

Target Audience:

This course is designed for mechanical engineers, piping designers, CAD professionals, and engineering students who wish to enhance their expertise in SolidWorks for routed systems and flow simulation.

Course Objective:

The objective of this course is to equip learners with the skills to design and manage complex piping, tubing, HVAC, and electrical routes, and to simulate real-world fluid and thermal systems using SolidWorks Flow Simulation.

Course Outcome:

Upon completion, participants will be able to create advanced routing assemblies, customize components, and conduct flow and thermal analyses for various engineering applications, enabling more efficient and optimized design workflows.

Prerequisites

Before attending the SOLIDWORKS Routing: Piping and Tubing course, participants should have a solid understanding of basic SOLIDWORKS part and assembly modeling. Familiarity with sketching, creating features, and working with assemblies is essential. Prior experience with mechanical design or piping systems will be helpful but is not mandatory. Completion of the SOLIDWORKS Essentials course is highly recommended to ensure a smooth learning experience.

Course Outline:

The course comprises **40-hours** of theory and labs and is divided into **9** different chapters. Each chapter will be followed by **hands-on lab exercises** to reinforce learning and gauge understanding of the topics covered.

Lesson 1: Fundamentals of Routing

- What is Routing?
- Types of Routes
- Routing Feature Manager
- External vs. Virtual Files
- Routing Setup and Add-ins
- Routing Library Manager
- File Locations and Settings

Lesson 2: Piping Routes

- Piping Route Basics
- Typical Piping Route
- Route Sketch
- Piping Components: End, In-Line, Others
- Assembly Templates
- Auto Route and Route Specification Templates
- Exercises:
    - Creating Templates
    - Multiple Piping Routes 1

Lesson 3: Advanced Piping Routes

- Alternate Elbows and Editing Routes
- Piping Hangers
- Routing Along Geometry
- Exercises:
    - Multiple Piping Routes 2

Lesson 4: Piping Fittings

- Drag and Drop Fittings
- Planes and Orientation
- Adding Tees and Removing Pipe
- Creating Custom Fittings
- Exercises:
    - Piping Fittings
    - Piping on a Frame

Lesson 5: Tubing Routes

- Tubing Basics
- Tubing Components
- Flexible and Orthogonal Tubing
- Bend Errors and Fixes
- Exporting Tube Data
- Tubing Drawings

- Exercises:
  - Orthogonal Tubing Routes
  - Flexible Tubing Routes
  - Combined Routing

Lesson 6: Piping and Tubing Changes

- Changing Route Diameter
- Pipe Penetrations and Flange Connections
- Pipe Spools and Gaskets
- Slope Addition
- Threaded Fittings
- Drawing Creation
- Exercises:
  - Threaded Pipe Routes
  - Pipe Spools

Lesson 7: Creating Routing Components

- Routing Libraries and Categories (Piping, Tubing, Electrical, HVAC)
- Creating/Copying Routing Parts
- Routing Component Wizard
- Component Attributes and Design Tables
- Exercises:
  - Creating and Using Equipment

Lesson 8: Electrical Ducting, Cable Tray, and HVAC Routes

- Routing for Electrical and HVAC
- Modifying Library Parts
- Components and Coverings
- Routing Drawings
- Exercise:
  - Electrical Ducting Routes

Lesson 9: Using SOLIDWORKS Content

- Accessing and Adding Content
- File Organization
- Custom Library Naming
- Virtual Clips and Used Components
- Exercise:
  - Using SOLIDWORKS Content