Autodesk Inventor Cable and Harness Design

Target Audience

This course is designed for electrical and mechanical design engineers, control panel and automation professionals, and CAD designers who wish to extend 2D electrical design into 3D modelling. It is also suitable for students or trainees seeking industry-ready skills in 3D cable and harness design using Autodesk Inventor.

Course Objective

This course aims to provide participants with the ability to create, route, and document 3D cable and harness assemblies in Autodesk Inventor. Participants will develop 3D electrical panels with accurate component placement, constraints, and alignment; visualize cable routing, panel depth, and bend radius; configure and manage libraries, connectors, and reports for electrical documentation; and communicate design intent through professional drawings, nailboards, and exported reports.

Course Outcome

- **3D Cable and Harness Design:** Learn to create and manage detailed 3D cable and harness assemblies for electrical panels.
- **Component Placement and Constraints:** Gain proficiency in aligning, constraining, and assembling electrical components in a 3D environment.
- **Cable Routing and Visualization:** Master the process of routing, modifying, and visualizing cables and harnesses with accurate depth and bend radius.
- **Design Documentation and Reporting:** Generate nailboard drawings, reports, and documentation for manufacturing and design communication.

Course Outline: The course comprises **40-hours** of theory and demonstrations and is divided into **6** different chapters. Each chapter is designed with practical examples and guided exercises to reinforce learning and ensure a strong understanding of 3D cable and harness design concepts.

Chapter 1: Getting Started Creating Cable and Harness Designs

About Cable and Harness
Creating a Cable and Harness Design
Creating a Harness Assembly
Configuring Harness Settings
Inserting Electrical Parts
Setting Unique Part Properties for Electrical Parts

Chapter 2: Wire a Harness Assembly

Adding Wires and Cables
- Adding Cables
- Global Settings

Routing Wires and Cables
- About Route Segments
- Creating Segment Branches
- Segment Properties
- Manual Routing
- Automatic Routing
- View Path Tool
- Unrouting Wires and Cables

Importing Wire and Cable Data
- Reviewing Data Before Import
- Correcting Import Issues

Adding Ribbon Cables
- Adding a Fold
- Editing a Twist
- Ribbon Cable Properties

Chapter 3: Refine a Cable and Harness Design

Modifying Wires, Cables, Segments, and Ribbon Cables
- Common Edits
- Toggling Display as Rendered
- Changing Definitions and Connection Points
- Deleting Wires, Cables, or Route Segments
- Adding and Modifying Points
- Checking Bend Radius

- Copying a Design

Working with Splices
- About Splices
- Adding a Splice
- Splice Modifications
- Editing a Wire to a Splice

Working with Virtual Parts
- About Virtual Parts
- Assigning Virtual Parts
- Editing Virtual Parts

Chapter 4: Communicate the Design

Creating Drawing Views of Cable and Harness Designs
- Creating 2D Drawings
- Creating Nailboard Drawing Views
- Modifying a Nailboard View
- Adding Connector Views

Annotating Nailboards
- Adding Harness Dimensions
- Displaying Harness Properties
- Loom and Label Virtual Parts
- Display as Actual Diameter
- Adding Tables with Data from Another File

Exporting and Reporting Design Data
- About Exported Data
- Exporting Data
- Generating Report Data

Chapter 5: Configure Library and Report Configuration Files

Library Definitions and Library Files
- Adding a New Library Type
- Exporting and Importing Library Objects
- Data File (CSV) Format

Configuration Files for Reports, Imports, and Exports
- About Configuration Files
- Link Types and Name Values
- Defining an Import/Export Configuration File

Chapter 6: Create, Author, and Publish Electrical Content

- Defining Electrical Parts and Connectors
  - About Electrical Parts
  - Creating an Electrical Part
  - Adding a Pin to an Electrical Part
  - Adding a Group to an Electrical Part
- Managing Libraries
  - About the Content Center
  - Installation Options
  - Adding a Custom Library
  - Configuring the Content Center File Path
  - Transferring Library Content
- Creating Library Content
  - Creating Custom Content
  - Authoring Electrical Connectors
  - Publishing Electrical Parts and Connectors
- Managing Library Content
  - Copying Content to a Custom Library
- Document Settings for Published Parts
  - Adding and Editing Family Column Values
  - Adding a Custom Display Name
- Editing Family Table Data in Excel
- Creating New Families or Adding Members Using the Material Guide