

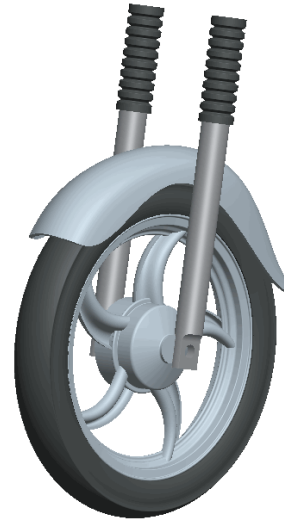
# Freeform Surfacing using Pro/ENGINEER Wildfire 4.0

## Overview

Course Code **TRN-2178-T**

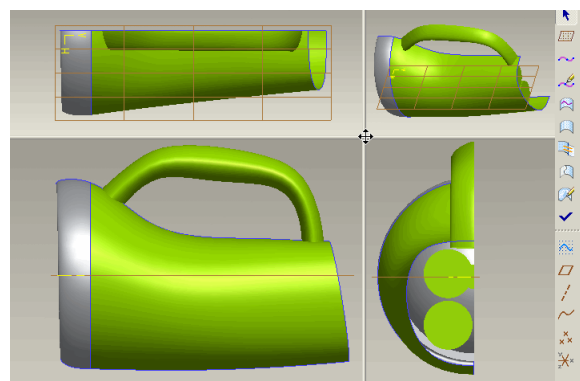
Course Length **2 Day**

In Pro/ENGINEER Wildfire 4.0 you can create freeform surface models using the interactive surface design extension (ISDX) modeling environment, often called Freeform Surfacing or Style surfacing. The Style tool is a spline-based freeform modeler that enables you to combine the parametric feature-based modeling approach with the unconstrained freeform surface modeling approach. This gives you the flexibility to design complex-shaped products in a single modeling environment. In this course, you learn how to use the Style tool to create and manipulate freeform curves, freeform surfaces, freeform surface details, and advanced freeform surface models. You also learn how to integrate style features with other parametric features in design models. After completing this course, you will be well prepared to design complex-shaped freeform surface models in Pro/ENGINEER Wildfire 4.0. At the end of each module, you will complete a set of review questions to reinforce critical topics from that module. Your instructor will discuss these with the class. At the end of the course, you will find a course assessment in Pro/FICIENCY intended to evaluate your understanding of the course as a whole.



## Course Objectives

- Introduction to the Freeform Surface Modeling Process
- Understanding Freeform Surface Modeling Concepts
- Creating Initial Freeform Curves
- Developing Freeform Surface Models
- Advanced Tools and Techniques for Defining Freeform Shapes
- Creating Smooth Freeform Surface Models
- Integrating Style and Parametric Features
- Techniques for Creating Common Detailed Shapes



- Creating Complex, High Quality Freeform Models

## Prerequisites

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- Fast Track to Pro/ENGINEER Wildfire 4.0

## Audience

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- Design engineers, mechanical designers, who have a need to create styled surface geometry.
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# Agenda

## Day 1

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|--------|---|---|
| Module | 1 | Introduction to the Freeform Surface Modeling Process |
| Module | 2 | Understanding Freeform Surface Modeling Concepts      |
| Module | 3 | Creating Initial Freeform Curves                      |
| Module | 4 | Developing Freeform Surface Models                    |

## Day 2

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|--------|---|--|
| Module | 5 | Advanced Tools and Techniques for Defining Freeform Shapes |
| Module | 6 | Creating Smooth Freeform Surface Models                    |
| Module | 7 | Integrating Style and Parametric Features                  |
| Module | 8 | Techniques for Creating Common Detailed Shapes             |
| Module | 9 | Creating Complex, High Quality Freeform Models             |
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## Course Content

### **Module 1. Introduction to the Freeform Surface Modeling Process**

- i. Introduction to Freeform Surface Modeling
- ii. Understanding Surface Modeling Paradigms
- iii. Combining Freeform and Parametric Modeling
- iv. Typical Pro/ENGINEER Freeform Modeling Process

*Knowledge Check Questions*

### **Module 2. Understanding Freeform Surface Modeling Concepts**

- i. Understanding the Style Tool
- ii. Understanding Style Features
- iii. Understanding the Style Modeling Environment
- iv. Using Style Tool Shortcut Menus
- v. Using Style Tool Key Combinations
- vi. Understanding Active Planes
- vii. Understanding the Style Tool 4-View Layout
- viii. Understanding Style Preferences

*Knowledge Check Questions*

### **Module 3. Creating Initial Freeform Curves**

- i. Understanding Style Curves
- ii. Introduction to Creating Style Curves
- iii. Creating Style Curves as Circles or Arcs
- iv. Understanding Datum Features within Style
- v. Creating Style Points
- vi. Manipulating Style Point Locations
- vii. Editing Endpoint Tangency
- viii. Editing Soft Points
- ix. Editing Curves
- x. Copying and Moving Curves
- xi. Offsetting Curves
- xii. Using the 4-View Layout to Modify Curves
- xiii. Analyzing Curves
- xiv. Using Imported Images
- xv. Using Imported 3-D Data
- xvi. Using References from Design Models

*Knowledge Check Questions*

### **Module 4. Developing Freeform Surface Models**

- i. Understanding Style Surfaces
  - ii. Creating Boundary Surfaces
  - iii. Creating Loft Surfaces
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- iv. Using Multiple Curves as a Single Boundary
- v. Creating a Blend Surface using the Radial Option
- vi. Creating a Blend Surface using the Uniform Option
- vii. Using Surfaces to Define Curves
- viii. Creating a Curve on Surface Type Curve
- ix. Intersecting Surfaces to Create a COS
- x. Creating a Curve using the Curve from Surface Tool
- xi. Manipulating COS Type Curves

*Knowledge Check Questions*

### **Module 5. Advanced Tools and Techniques for Defining Freeform Shapes**

- i. Manipulating Shapes using Internal Curves
- ii. Creating Radial Path Planar Curves
- iii. Copying Curves Proportionally
- iv. Modifying Curve Shapes Proportionally
- v. Unlinking Style Curves
- vi. Making Curves Planar Between Endpoints
- vii. Editing Style Surfaces
- viii. Resolving Failed Style Geometry

*Knowledge Check Questions*

### **Module 6. Creating Smooth Freeform Surface Models**

- i. Understanding Curvature
- ii. Connecting Style Curves
- iii. Understanding Style Curve Connection Levels
- iv. Manipulating Curve Connections
- v. Connecting Surfaces
- vi. Understanding Surface Connection Order
- vii. Analyzing Continuity of Freeform Designs
- viii. Using the Curvature Analysis Tool
- ix. Using the Shaded Curvature Analysis Tool
- x. Using the Dihedral Angle Analysis Tool
- xi. Using the Reflection Analysis Tool

*Knowledge Check Questions*

### **Module 7. Integrating Style and Parametric Features**

- i. Understanding Parallel Modeling
- ii. Using Surfaces to Define Solid Geometry
- iii. Exporting Curve Parameters for Modification
- iv. Referencing a Parametric Framework
- v. Manipulating Style Geometry using Editing Tools

*Knowledge Check Questions*

### **Module 8. Techniques for Creating Common Detailed Shapes**

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- i. Creating Common Detailed Shapes
- ii. Creating Scoops or Bulges using Intersecting Surfaces
- iii. Creating Scoops or Bulges with Definite Boundaries
- iv. Creating Scoops or Bulges with Blurred Boundaries
- v. Creating Split Surface Geometry

*Knowledge Check Questions*

### **Module 9. Creating Complex, High Quality Freeform Models**

- i. Understanding Four-Boundary Surfaces
- ii. Using the Overbuild Technique
- iii. Using the Create Boundaries Technique
- iv. Using the Void Boundary Technique
- v. Creating a Four-Boundary Rounded Shape
- vi. Creating a Triangular Shape using Four Boundaries

*Knowledge Check Questions*

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