

Freeform Surfacing Using Creo Parametric

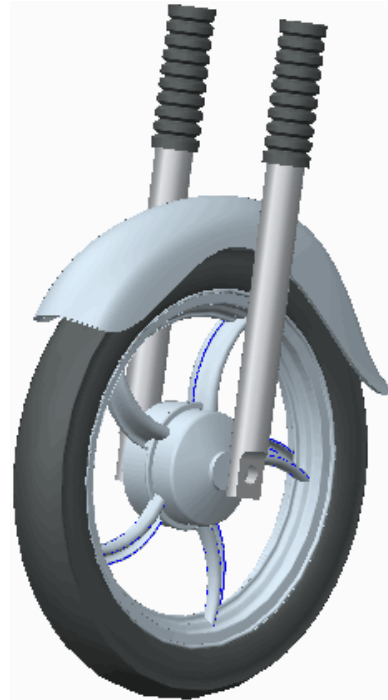
Overview

Course Code	TRN-3425-T
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Course Length	2 Days
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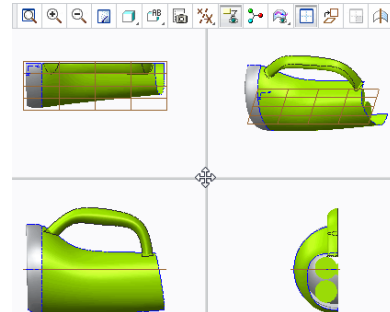
In Creo Parametric, you can create freeform surface models using the Style and Freestyle modeling environments. Collectively, the use of these environments is often called Freeform surfacing. The Style modeling environment is a spline-based freeform modeler that enables you to combine the parametric 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. The Freestyle modeling environment provides commands to create smooth and well defined B-spline surfaces quickly and easily using a polygonal control mesh.

In this course, you will learn how to use the Style and Freestyle environments to create and manipulate freeform curves, freeform surfaces, freeform surface details, and advanced freeform surface models. You will 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 Creo Parametric. 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 Freestyle Surface Modeling Process
- Creating Freestyle Surface Models
- Introduction to the Style Surface Modeling Process
- Understanding Style Surface Modeling Concepts
- Creating Initial Style Curves
- Developing Style Surface Models
- Advanced Tools and Techniques for Defining Style Shapes
- Creating Smooth Style Surface Models
- Integrating Style and Parametric Features
- Techniques for Creating Common Detailed Shapes
- Creating Complex, High Quality Style Surface Models



Prerequisites

- Introduction to Creo Parametric

Audience

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

Agenda

Day 1

Module	1	Introduction to the Freestyle Surface Modeling Process
Module	2	Creating Freestyle Surface Models
Module	3	Introduction to the Style Surface Modeling Process
Module	4	Understanding Style Surface Modeling Concepts
Module	5	Creating Initial Style Curves
Module	6	Developing Style Surface Models

Day 2

Module	7	Advanced Tools and Techniques for Defining Style Shapes
Module	8	Creating Smooth Style Surface Models
Module	9	Integrating Style and Parametric Features
Module	10	Techniques for Creating Common Detailed Shapes
Module	11	Creating Complex, High Quality Style Surface Models

Course Content

Module 1. Introduction to the Freestyle Surface Modeling Process

- i. Introduction to Freeform Surface Modeling
- ii. Understanding Surface Modeling Paradigms
- iii. Typical Freestyle Surface Modeling Process

Knowledge Check Questions

Module 2. Creating Freestyle Surface Models

- i. Understanding the Freestyle Tool
- ii. Understanding the Freestyle Environment
- iii. Creating Primitives
- iv. Transforming Primitives
- v. Splitting Edges
- vi. Splitting Faces
- vii. Creating Creases
- viii. Extruding Freestyle Surfaces
- ix. Using Trace Sketches with Freestyle Surfaces
- x. Mirroring Freestyle Features
- xi. Connecting Freestyle Surfaces

Knowledge Check Questions

Module 3. Introduction to the Style Surface Modeling Process

- i. Combining Style and Parametric Modeling
- ii. Typical Style Modeling Process

Knowledge Check Questions

Module 4. Understanding Style Surface Modeling Concepts

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

Knowledge Check Questions

Module 5. Creating Initial Style Curves

- i. Understanding Style Curves
 - ii. Creating Basic Style Curves
 - iii. Creating Style Curves as Circles or Arcs
 - iv. Manipulating Style Point Locations
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- v. Connecting Curves Using Soft Points
- vi. Manipulating Soft Points
- vii. Defining Endpoint Tangency
- viii. Defining Soft Endpoint Tangency
- ix. Editing Curves
- x. Creating Radial Path Planar Curves
- xi. Using the 4-View Layout to Modify Curves
- xii. Analyzing Curves

Knowledge Check Questions

Module 6. Developing Style Surface Models

- i. Understanding Style Surfaces
- ii. Creating Boundary Surfaces
- iii. Creating Loft Surfaces
- 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. Creating N-Sided Surfaces
- viii. Using Surfaces to Define Curves
- ix. Creating a Curve on Surface Type Curve
- x. Intersecting to Create a Curve on Surface
- xi. Creating a Curve Using Curve from Surface
- xii. Manipulating Curve on Surface Type Curves
- xiii. Trimming Surfaces in the Style Tool

Knowledge Check Questions

Module 7. Advanced Tools and Techniques for Defining Style Shapes

- i. Manipulating Shapes Using Internal Curves
- ii. Copying and Moving Curves
- iii. Copying Curves Proportionally
- iv. Offsetting Curves
- v. Modifying Curve Shapes Proportionally
- vi. Unlinking Style Curves
- vii. Making Curves Planar Between Endpoints
- viii. Editing Style Surfaces
- ix. Resolving Failed Style Geometry
- x. Using References from Design Models
- xi. Using Imported 3-D Data

Knowledge Check Questions

Module 8. Creating Smooth Style Surface Models

- i. Understanding Curvature
 - ii. Using the Curvature Analysis Tool
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- iii. Using Visual Mirror with a Curvature Analysis
- iv. Manipulating Surface Boundary Connections
- v. Understanding Surface Connection Order
- vi. Analyzing Continuity of Style Designs
- vii. Using the Shaded Curvature Analysis Tool
- viii. Using the Reflection Analysis Tool
- ix. Using the Dihedral Angle Analysis Tool

Knowledge Check Questions

Module 9. Integrating Style and Parametric Features

- i. Understanding Parallel Modeling
- ii. Using Style 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 10. Techniques for Creating Common Detailed Shapes

- 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 11. Creating Complex, High Quality Style Surface Models

- i. Understanding Singularity in Triangular Surfaces
- ii. Reparameterizing a Surface
- iii. Understanding Four-Boundary Surfaces
- iv. Using the Overbuild Technique
- v. Using the Create Boundaries Technique
- vi. Using the Void Boundary Technique
- vii. Creating a Four-Boundary Rounded Shape
- viii. Creating a Triangular Shape Using Four Boundaries

Knowledge Check Questions
