

# Surfacing using Creo Parametric

## Overview

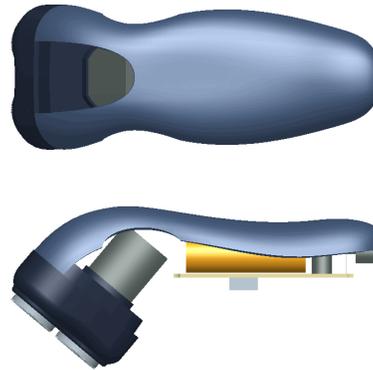
---

Course Code TRN-3406-T

Course Length 3 Day•

In this course, you will learn how to use various techniques to create complex surfaces with tangent and curvature continuities. You will also learn how to manipulate surfaces using editing tools, and analyze surfaces for quality and desired characteristics. In addition, you will learn how to create solid features using the surfaces as references. After completing this course, you will be well prepared to create complex shaped models using surfaces in Creo Parametric.

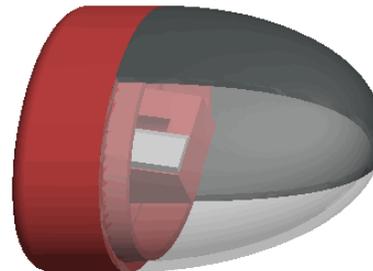
At the end of each module, you will complete a skills assessment. The questions are used to help reinforce your understanding of the module topics and form the basis for review of any topics, if necessary.



## Course Objectives

---

- Describe surface modeling and its terminology
- Learn advanced selection techniques
- Create advanced datum features
- Use advanced sketching techniques
- Learn basic surfacing tools
- Create various boundary surfaces
- Create variable section sweep surfaces
- Create helical sweep surfaces
- Create swept blend surfaces
- Utilize surface analysis tools
- Extend and trim surfaces
- Manipulate surfaces
- Create and edit solid models using surface quilts
- Utilize the master model technique



## Prerequisites

---

- Introduction toCreo Parametric
- Update to Creo Parametric from Creo Elements/Pro 5.0

## Audience

---

- This course is intended for mechanical designers, design engineers, industrial designers, and related roles. The topics in this course are also available as Web-based training courses.
-

## Agenda

### Day 1

---

Module	1	Surface Modeling Overview
Module	2	Advanced Selection
Module	3	Advanced Datum Features
Module	4	Advanced Sketching
Module	5	Basic Surfacing Tools
Module	6	Boundary Blend Surfaces

### Day 2

---

Module	7	Additional Boundary Surfaces
Module	8	Sweep Surfaces with Variable Sections
Module	9	Helical Sweeps
Module	10	Swept Blends
Module	11	Analyzing Surface Curvature
Module	12	Additional Surface Analysis Tools

### Day 3

---

Module	13	Extending and Trimming Surfaces
Module	14	Manipulating Surfaces
Module	15	Creating and Editing Solids using Quilts
Module	16	Master Model Technique
Module	17	Project

---

## Course Content

### Module 1. Surface Modeling Overview

- i. Introduction to Surfacing
- ii. Surface Modeling Uses
- iii. Surface Modeling Paradigms
- iv. Freeform Overview
- v. Blending Surface Modeling Paradigms
- vi. Surfacing Terms

*Knowledge Check Questions*

### Module 2. Advanced Selection

- i. Advanced Chain Selection
- ii. Advanced Surface Selection

*Knowledge Check Questions*

### Module 3. Advanced Datum Features

- i. Creating Datum Graphs
- ii. Creating Datum Coordinate Systems
- iii. Creating Points On or Offset from Entities
- iv. Creating Points at Intersections
- v. Creating Points using an Offset Coordinate System
- vi. Sketching Geometry Datums
- vii. Creating Curves Through a Point or Vertex
- viii. Creating a Curve Through a Point Array
- ix. Creating a Curve from a Cross-Section
- x. Creating a Curve From Equation
- xi. Creating Composite Curves
- xii. Creating a Curve from Curve Intersections
- xiii. Creating a Curve at Surface Intersection
- xiv. Projecting and Wrapping Curves
- xv. Trimming Curves
- xvi. Creating Offset Curves
- xvii. Creating Cosmetic Sketches

*Knowledge Check Questions*

### Module 4. Advanced Sketching

- i. Using Sketched Curves
  - ii. Sketching Ellipses
  - iii. Sketching Elliptical Fillets
  - iv. Sketching Splines
  - v. Modifying Splines — Basic Operations
  - vi. Modifying Splines — Advanced Operations
-

- vii. Importing and Exporting Spline Points
- viii. Sketching Conics
- ix. Sketching Text
- x. Analyzing Sketcher Convert Options
- xi. Locking Sketcher Entities
- xii. Analyzing Sketcher Dimension Options
- xiii. Sketcher Diagnostic Tools

*Knowledge Check Questions*

**Module 5. Basic Surfacing Tools**

- i. Creating Surface Extrude Features
- ii. Creating Surface Revolve Features
- iii. Creating Fill Surfaces
- iv. Creating Sweep Surfaces with Open Trajectories
- v. Creating Sweep Surfaces with Closed Trajectories
- vi. Creating Parallel Blend Surfaces
- vii. Analyzing Parallel Blend Surface Attributes
- viii. Analyzing Parallel Blend Surface Section Tools
- ix. Understanding Rotational and General Blend Theory
- x. Creating Rotational Blend Surfaces
- xi. Analyzing Rotational Blend Surface Attributes
- xii. Creating General Blend Surfaces
- xiii. Analyzing General Blend Surface Attributes
- xiv. Defining Rotational and General Blend Surface Tangency
- xv. Selecting Sections for Rotational and General Blend Surfaces

*Knowledge Check Questions*

**Module 6. Boundary Blend Surfaces**

- i. Understanding Boundary Curve Concepts
- ii. Creating Boundary Blends in One Direction
- iii. Creating Boundary Blends in Two Directions
- iv. Analyzing Blended Surface Boundary Conditions
- v. Analyzing Blended Surface Constraint Options
- vi. Analyzing Blended Surface Control Points

*Knowledge Check Questions*

**Module 7. Additional Boundary Surfaces**

- i. Creating Conic Surfaces from Boundaries
- ii. Creating Approximate Blended Surfaces
- iii. Analyzing Approximate Blended Surface Options
- iv. Creating N-Sided Surfaces
- v. Creating a Blend Tangent to Surfaces

*Knowledge Check Questions*

---

**Module 8. Sweep Surfaces with Variable Sections**

- i. Understanding Sweeps with Variable Sections
- ii. Creating Sweep Surfaces using a Constant Section
- iii. Creating Sweep Surfaces using Normal to Trajectory
- iv. Creating Sweep Surfaces using Constant Normal Direction
- v. Creating Sweep Surfaces using Normal to Projection
- vi. Analyzing Horizontal and Vertical Control in a Sweep Surface
- vii. Creating Sweep Surfaces Utilizing Multiple Trajectories
- viii. Creating Sweep Surfaces using Tangent Trajectories
- ix. Analyzing Sweep Surface Trajectory Options and Rules
- x. Using Trajpar with Surface Features
- xi. Using Trajpar and Datum Graphs with Sweep Surface Features

*Knowledge Check Questions*

**Module 9. Helical Sweeps**

- i. Understanding Helical Sweeps Theory
- ii. Utilizing Helical Sweeps for Surfaces
- iii. Analyzing Helical Sweep Surface Profile and Pitch Variations
- iv. Utilizing Variable Sections in Helical Sweep Surfaces

*Knowledge Check Questions*

**Module 10. Swept Blends**

- i. Understanding Swept Blend Theory
- ii. Creating Swept Blend Surfaces by Selecting Sections
- iii. Creating Swept Blend Surfaces by Sketching Sections
- iv. Analyzing Swept Blend Surface Section Options
- v. Analyzing Swept Blend Surface Section Plane Control
- vi. Analyzing Horizontal and Vertical Control in a Swept Blend Surface
- vii. Analyzing Swept Blend Surface Tangency
- viii. Analyzing Swept Blend Surface Options
- ix. Analyzing Swept Blend Rules

*Knowledge Check Questions*

**Module 11. Analyzing Surface Curvature**

- i. Analyzing Surfaces Theory
  - ii. Defining Curvature
  - iii. Defining Curvature Continuity
  - iv. Analyzing Curvature of Curves
  - v. Analyzing Curvature of Surfaces
  - vi. Analyzing Curvature using Sections
  - vii. Analyzing Curvature using Normals
  - viii. Using Shaded Curvature Analysis for Surfaces
  - ix. Using Shaded Section Curvature Analysis
-

- x. Creating Curvature Continuous Surfaces

*Knowledge Check Questions*

#### **Module 12. Additional Surface Analysis Tools**

- i. Using the Point Analysis Option
- ii. Using the Radius Analysis Option
- iii. Using the Dihedral Angle Analysis Option
- iv. Using the Offset Analysis Option
- v. Using the Draft Analysis Option
- vi. Using the Slope Analysis Option
- vii. Using the Reflection Analysis Option
- viii. Using the Shadow Analysis Option

*Knowledge Check Questions*

#### **Module 13. Extending and Trimming Surfaces**

- i. Extending Surfaces
- ii. Extending Surfaces using Measurements
- iii. Analyzing Extend Surface Options
- iv. Creating a Surface Trim
- v. Trimming Surfaces with Geometry
- vi. Trimming Surfaces with Quilts Options
- vii. Trimming Surfaces with the Silhouette Trim Option
- viii. Trimming Surfaces with the Vertex Round Option

*Knowledge Check Questions*

#### **Module 14. Manipulating Surfaces**

- i. Copying and Pasting Surfaces
- ii. Offsetting Surfaces
- iii. Offsetting Surfaces with the Expand Option
- iv. Offsetting Surfaces with Draft
- v. Moving and Rotating Quilts
- vi. Mirroring Quilts
- vii. Merging Surfaces

*Knowledge Check Questions*

#### **Module 15. Creating and Editing Solids using Quilts**

- i. Thickening Surface Quilts
- ii. Solidifying Quilts to Add Material
- iii. Solidifying Quilts to Remove Material
- iv. Solidifying Quilts to Replace Material
- v. Offsetting Surfaces using the Replace Option
- vi. Creating Rounds on Surfaces
- vii. Converting Solid Rounds to Surfaces

*Knowledge Check Questions*

---

**Module 16. Master Model Technique**

- i. Master Model Technique Theory
- ii. Creating a Master Model
- iii. Creating Framework in the Master
- iv. Creating Surfaces in the Master
- v. Refining and Completing the Master Model
- vi. Sharing Geometry from the Master Model
- vii. Completing Body Components

*Knowledge Check Questions***Module 17. Project**

- i. The Shaver
  - ii. Creating the Master Model
  - iii. Creating Framework in the Master Model
  - iv. Creating Surfaces in the Master Model
  - v. Refining and Completing the Master Model
  - vi. Sharing Geometry from the Master Model
  - vii. Creating a Body Component
-