

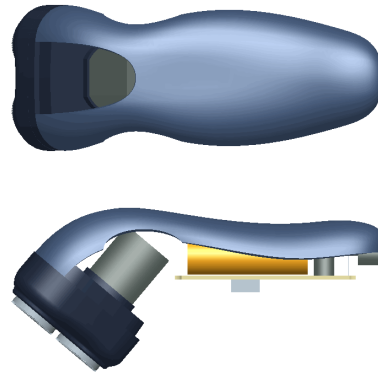
Surfacing using Pro/ENGINEER Wildfire 5.0

Overview

Course Code TRN-2239-T

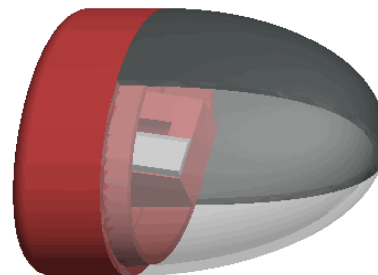
Course Length 3 Days

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 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. Pro/FICIENCY assessments will be provided in order for you to assess your understanding of the course materials. The assessment results will also identify the class topics that require further review. At the end of the class, you will either take an assessment by using your PTC University account, or your instructor will provide training on how to do this after the class. After completing this course, you will be well prepared to create complex shaped models using surfaces in Pro/ENGINEER Wildfire 5.0.



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 to Pro/ENGINEER Wildfire 5.0
- Pro/ENGINEER Wildfire 5.0 Update from Pro/ENGINEER Wildfire 4.0.

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	Variable Section Sweeps
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 File
- x. Creating a Curve from a Cross-Section
- xi. Creating a Curve From Equation
- xii. Creating Composite Curves
- xiii. Creating a Curve from Curve Intersections
- xiv. Creating a Curve at Surface Intersection
- xv. Projecting and Wrapping Curves
- xvi. Trimming Curves
- xvii. Creating Offset Curves

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
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- 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 Between Surfaces
 - vi. Creating a Blend Section to Surfaces
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- vii. Creating a Blend Tangent to Surfaces

Knowledge Check Questions

Module 8. Variable Section Sweeps

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

Knowledge Check Questions

Module 9. Helical Sweeps

- i. Understanding Helical Sweeps Theory
- ii. Utilizing Helical Sweeps for 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
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- 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
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