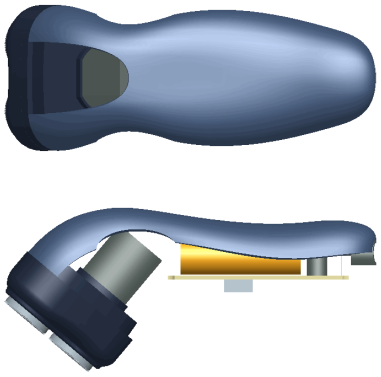
Surfacing using Pro/ENGINEER Wildfire 4.0

Overview

Course Code	TRN-2176–T
Course Length	3 Days



The Surface Modeling with Pro/ENGINEER Wildfire 4.0 training course teaches you how to use surface modeling in Pro/ENGINEER Wildfire 4.0 to create models with shapes that are too complex for solid features. 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 via 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 4.0.

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 4.0
- Pro/ENGINEER Wildfire 4.0 Update from Pro/ENGINEER Wildfire 3.0.

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. Creating Sketched Points
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

vii. Importing and Exporting Spline Points
viii. Sketching Conics
ix. Sketching Text
x. Analyzing Sketcher Convert Options
xi. Analyzing Sketcher Dimension Options
xii. 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
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
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