PolyWorks | Inspector™ Premium + Modeler™ Premium Training Course

Introduction to PolyWorks
- Workspace Manager
- Basic Options
- File and Project Structures
- PolyWorks License Manager

PolyWorks | Inspector Topics

Introduction to PolyWorks | Inspector
- User Interface
- Basic Options
- Visual Layout

Real-Time Quality Meshing
- Scanning Parameters
- Quality Metrics
- Unifying models using Targets and Best Fit

Basic Workflow
- Importing Reference & Data
- Basic Alignments
- Basic Colour Map Comparison
- Creating Report Tables
- Taking Snapshots
- Creating Formatted Report

Managing Reference & Data Objects
- Managing Reference Objects
- CAD Tolerances
- CAD Based Clean Up
Feature Creation

- Creating Nominals from CAD or Polygonal models
- Creating Measured by Probing
- Creating Measured from Polygonal or Point Cloud models

Feature Extraction

- Setting up feature properties to extract the measured from the nominals

Geometry Controls

- Dimensional Controls
- Geometric Dimensioning & Tolerancing (GD&T) Controls
- Editing Annotations
- Templates

Feature Based Measurements and Additional Features

- Distance & Angle Features
- Surface, Patterns and Slab Features

Feature Based Alignments and Alignment History

- Plane, Axes, Center Point (3-2-1)
- Best-Fit Measurement Objects
- Perpendicular Planes
- Datum Reference Frame Alignment
- Using Alignment Groups and reverting back to previous alignments

Reference Targets Alignments

- Creating Surface and Feature Reference Targets

Data Colour Maps and Point Annotations

- Deviation between Data and Reference Objects/Feature Primitives/other Data
- Customizing the Colour map and Enhanced Colouring
- Picking points on model for error annotation readings

Cross-Sections

- Creating Standard, Offset and Section View Cross-Sections

Comparison Points

- Creating Comparison Points on Surfaces, Cross-Sections, Polylines, Trimmed Edges and Hemmed Edges

3D and 2D Calipers

- Creating Standard and Cross-Section Calipers
- Single Axis and Offset Axes (depth gauge)

Coordinate Systems

- Creating Cartesian, Cylindrical and Spherical Coordinate Systems

Reporting

- Control Reviewer
- Creating Report Items: Snapshots, Tables and Additional Report Items
- Creating and Compiling Formatted Reports

Multiple Piece Inspection and SPC

- Multiple inspections in one project
- Statistical Process Control (SPC)
PolyWorks | Viewer
- Free Project Viewer

Additional Measurement Topics

Offline Simulation & Sequencer
- How to create complete inspection programs offline without a device or parts
- How to rearrange the sequence or measurements and further programming of inspection projects

Basic Measurements and 2D Features
- Picking on 3D or 2D points to measure between
- Measuring 2D Cross-Sections Features

Flush & Gap Gauges
- Measured between 2 models
- Alignment using Flush & Gap Gauges

Profile Gauges
- One or Two radii measurements

Volume Measurements
- Measuring Data or Plane or Data to Data

Surface Data SPC and creating Deviation Models
- Deviation Colour Map of Multiple Data Models
- Creating Deviation Models as Point Clouds or Polygonal Models

Additional Airfoil Gauge Module

Aligning Airfoil Blades
- 6 Point Nest
- Datum Reference Frame Alignment

Airfoil Gauges
- Creating and Measuring Airfoil Gauges

PolyWorks | Modeler Topics

Introduction to PolyWorks | Modeler
- User Interface, Basic Options and Typical Workflow

Importing Models
- Importing Polygonal and CAD models

Units
- Importing objects with different units

Scaling
- Scaling models using “Units Conversion”

Creating Primitives
- Creating Planes and Points Primitives
Alignment Techniques
  • Manual Alignment
  • Rotate Plane A to Plane B
  • Translate to Plane

Model Topology and Watertightness
  • Analysing Polygonal models for Triangular & Vertices errors
  • Analysing Polygonal models for holes

Optimising Polygonal Meshes
  • Optimise Mesh
  • Improve Equiangularity
  • Subdivide Mesh
  • Reduce Mesh

Hole Filling
  • Automatically and Interactively hole filling
  • Filling holes using Surfaces and Merging Models

Smoothing Meshes
  • A tool that smooths Vertices along surfaces

Reconstructing Meshes
  • A tool that deletes selected triangles and reconstructs them

Creating and Editing Curves
  • Standard Curves
  • Boundary Curves
  • Feature Center Curves
  • Fillet Tangent Curves
  • Edge Curves

Boundary and Sharp Edge Reconstruction
  • Reconstructing triangles up to curves

Creating Fillets, extending boundaries and slicing models
  • Creating Fillet rads
  • Extruding boundary surface
  • Slicing Models with Planes and Curves

Importing Objects from other Projects
  • Importing objects such as Models, Features, Cross-Sections etc. from other Projects such as PolyWorks | Inspector Projects etc

Creating Cross-Sections
  • Create Cross-Sections by Anchoring 2 points or Numerically

Hole Cutting
  • Importing Features from PolyWorks | Inspector Projects
  • Using closed Curves or Features from PolyWorks | Inspector Projects

Offset Models
  • Offset selected triangles in a selected direction with the option of keeping the original or even creating walls around the boundaries
Mirror Models
- Mirror selected triangles about a standard or created plane

Extracting Sketch Outlines
- Defining Sketch Planes and creating Sketch Outlines from either a Single Cross-Section, Multiple Cross-Sections or a Silhouette Edge

Measuring Draft Angles
- Measuring from 2 points and Inward vs Outward Draft Angles

Creating Sketch Entities
- Creating Lines, Circles, Arcs, Splines and Rectangles
- View Auto-Relations and Entity Deviations

Editing Sketch Entities
- Modifying entities numerically, adding relations, dragging entities, replacing entities, rebuilding entities and deleting entities

Adding Dimensions
- Linear Dimensions
- Angular Dimensions
- Radial Dimensions

Creating Curves Networks
- Creating a grid of curves to create typically 4 sided patches

Creating and Editing NURBS Surface Patches
- Creating smooth typically 4 sided surfaces
- Creating N-Sided Surface Patches
- Edit the Curves to modify and improve quality of NURBS patches

Fitting NURBS Surface Patches
- Fit the NURBS patches to the surface of the Polygonal model
- Loose and flexible fitting NURBS for more accurate models
- Tight and stiff fitting NURBS for higher quality surfaces

Cutting Holes Through NURBS Models
- Importing Features from PolyWorks | Inspector Projects
- Using closed Curves or Features from PolyWorks | Inspector Projects

Planar and Symmetry Constraints
- NURBS patches and Curves can be projected and constrained to Planes for planar/symmetrical surfaces

CAD Reconstruction
- Creating NURBS Patches from Scan Data to reconstruct original CAD Models

Alternative Servicing Processes
- Measuring features to export into original 3D CAD Packages as surfaces to reverse engineer
- Simplifying Curve Networks on flat surface and complex networks
Machine Configuration
- Activating plug-ins for CNC and I++ CMMs
- Creating and locating Reference Spheres
- Creating and calibrating Tools
- Creating and locating Tool Changers

Setup Probing Parameters
- CNC Probe Measurement Method
- Number and Position of Measurement Points
- Probe Movements and Clearances
- Offset Measurement Objects

Go to Positions
- Absolute or Relative
- Numerically or From Device
- Pick Go to Position from 3D Scene

Tool Orientation Change
- Creating Tool Orientations from List or Grid
- Pick Tool Orientations from 3D Scene
- Calibrating Tool Orientations

CNC CMM Prealignment
- Axis Match
- Alignment Point

Simulating and Validating CMM Programs
- Creating programs using the Sequence Editor
- Simulating the program using the Offline Simulation Mode
- Stepping through the Sequence to validate the program
- Play Inspection using New Piece

Additional CNC CMM Topics

Switching between CNC CMM and Portable Devices
- Adjusting the Sequence to work with other CMM devices
- Adjusting the Sequence to work with portable devices

CNC CMM Scanning
- Manually Scanning and CNC CMM Scanning
- Creating Area Based Scan Paths
- Creating Linear Based Scan Paths
- Clipping Plane using CMM Table

Multi-CMM Setup
- Setup network localization and directories
- CMM Localization Macro
- Creating Sequences and Synchronization Steps
- Deploying Projects and validating the programs