Creo™ Parametric 1.0 Tutorial and MultiMedia DVD

Roger Toogood Ph.D., P. Eng.,
Jack Zecher P.E.
# TABLE OF CONTENTS

Preface i
Notes for the WILDFIRE 5.0 Edition ii
Note to Instructors iii
Acknowledgments iv
About the DVD v
Table of Contents vi

## Introduction to Creo Parametric

A Few Words Before You Dive In... Intro - 1
What IS Creo Parametric? Intro - 2
This sounds like it’s pretty complicated!... Intro - 5
Overview of the Lessons Intro - 6
On-Line Help Intro - 9

## Lesson 1 : User Interface, View Controls and Model Structure

Synopsis 1 - 1
Overview of this Lesson 1 - 1
Starting Creo Parametric 1 - 3
How commands are entered into Creo Parametric 1 - 5
The Quick Access and Graphics Toolbars 1 - 5
The Ribbon User Interface (UI) 1 - 5
Right Mouse Button (RMB) Pop-Up Menus 1 - 5
Pull-Down Menus 1 - 6
Dialog Windows 1 - 6
Menu Picks 1 - 7
Command/Message Window 1 - 8
Mouse Functions 1 - 8
How this tutorial will represent the command sequence 1 - 9

<table>
<thead>
<tr>
<th>Table 1-1 Common Creo Parametric Mouse Functions (3D)</th>
<th>1 - 10</th>
</tr>
</thead>
</table>

How to get On-Line Help 1 - 11
Tutorial Files and Working Directory 1 - 16
Controlling the Screen: View and Display Commands 1 - 18
Opening a Part File 1 - 18
View Controls using the Mouse 1 - 19
Graphics Toolbar View Commands 1 - 22
Using Named Views 1 - 22
Object Display Commands 1 - 24
Datum Display Commands 1 - 24
Anatomy of a Part - Understanding the Model Structure 1 - 26
Preselection Highlighting 1 - 26
Expanding the Model Tree 1 - 27
The Model Player 1 - 29
Exploring the Structure of a Part 1 - 29
Modifying Dimensions 1 - 33
Parent/Child Relations 1 - 34
Lesson 2 : Creating a Simple Object (Part I)

Synopsis
Overview of this Lesson
Creating a Simple Part
  Creating and Naming the Part
  Create Datum Planes
Part Modeling Feature Overview
Introducing Sketcher
  Table 2-1 Implicit Constraints in Sketcher
  Two Ways to use Sketcher to Create Shaped Features
  Table 2-2 Steps to create a sketched feature
Creating a Sketched Curve
  Setting Sketch Orientation
  The Sketcher Ribbon
  Table 2-3 Explicit Constraints in Sketcher
Creating the Sketch
  Weak vs Strong Dimensions
  Sketcher Diagnostic Functions
Creating a Solid Protrusion
  The Extrude Dashboard
Saving the Part
Creating an Extruded Cut
Using Part Templates
Questions for Review
Exercises

Lesson 3 : Creating a Simple Object (Part II)

Synopsis
Overview of this Lesson
Retrieving a Part
Creating a Hole
Creating a Chamfer
Creating a Round
Exploring the Model
  Configuring the Model Tree
  Naming Features
  Exploring Parent/Child Relations
Lesson 4: Revolved Protrusions, Mirror Copies, Rounds, and Chamfers

Synopsis
Overview of this Lesson
Creating the Base Feature
Creating a Revolved Protrusion
Adding and Mirroring a Cut
  Creating a Mirror Copy
Creating Holes
  Having Problems Mirroring?
Creating Rounds
Using Edge Sets with Chamfer
Saving the Part
Model Analysis Tools
Exploring the Model, or “What Can Go Wrong?”
Questions for Review
Exercises
Project

Lesson 5: Modeling Utilities and the 3 R’s

Synopsis
Overview of this Lesson
Obtaining Information about the Model
  The Regeneration Sequence
  The Feature List
  The Model Tree
  Parent/Child Relations
Suppressing and Resuming Features
  Suppressing versus Hiding
Modifying Feature Definitions
  Changing the shape of a sketch (Edit Definition)
  Changing a Feature Reference (Edit References)
Lesson 6: Datum Planes and Sketcher Tools

Synopsis
Overview of this Lesson
Overview of Datum Planes and Axes
Creating a Datum Plane and Datum Axis
Creating the Cutter Base Feature
  Creating a Coaxial Hole
First Tooth - Offset Datum
Second Tooth - Normal and Tangent Datum
Third Tooth - Using Make Datums
Exploring the Model
Considering Design Intent
Questions for Review
Exercises
Project

Lesson 7: Patterns and Copies

Synopsis
Overview of this Lesson
Patterned Features
  Naming Dimension Symbols
  Creating a Uni-directional Pattern
  Creating a Bi-directional Pattern
  Creating a Simple Radial Pattern
  Setting up Pattern Relations
A Pattern of Grouped Features
Radial Patterns of Shaped Features
  Radial Pattern using Make Datum as Sketching Plane
  Radial Pattern using Make Datum as Reference Plane
Copying Features with Paste and Paste Special
  Copying using Paste
  Copying using Paste Special
    Paste Special Using Translated and Rotated copies
Design Considerations
Questions for Review
Exercises
Project
Lesson 8: Engineering Drawings

Synopsis
Overview of this Lesson
The Drawing Environment
  Drawing Interface
  Mouse Controls in Drawing Mode
  Drawing Ribbon and Drawing Tree
    Layout
    Table
    Annotate
    Sketch
    Review

Shown vs Created Dimensions

Table 8.1 The Mysteries of Model vs Draft Dimensions

Dimension Properties
Exploring Associativity

The L-Bracket
  Creating the Part
  Changing Part Units
  Creating the Drawing of the L-Bracket
    ① Create the Drawing File
    ② Adding Views
    ③ Setting View Display Mode
    ④ Adding Dimensioning Detail
    ⑤ Dimension Cosmetics
    ⑥ Creating a Note
  Exploring Associativity
  Printing and Exporting the Drawing
  Using Drawing Templates

The Pulley
  Creating the Pulley
  Creating the Drawing
    ① Selecting a Formatted Sheet
    ② Creating the Primary View
    ③ Add a Full Section View
    ④ Modify the Section View Display
    ⑤ Adding a Detail View
    ⑥ Adding Dimension Details
    ⑦ Improving the Esthetics
    ⑧ Changing Drawing Options
    ⑨ Adding Notes with Parameters
    ⑩ Creating Dimensions

Conclusion
Questions for Review
Exercises
Project
Lesson 9 : Assembly Fundamentals

Synopsis 9 - 1
Overview of this Lesson 9 - 1
Collecting the Assembly Components 9 - 2
Assembly Constraints 9 - 2
  Default Constraint 9 - 4
  Coincident Constraint 9 - 4
  Normal Constraint 9 - 5
  Distance Constraint 9 - 6
  Parallel Constraint 9 - 7
  Angle Offset Constraint 9 - 7
  Tangent Constraint 9 - 7
  Fix Constraint 9 - 7
Assembly Design Issues 9 - 7
Assembling the Components 9 - 9
  Creating a Subassembly 9 - 9
  The 3D Dragger 9 - 11
  Using Allow Assumptions 9 - 14
  Creating the Main Assembly 9 - 16
  Adding a Subassembly 9 - 17
  Using Copy with Components 9 - 24
Assigning Appearances to Components 9 - 25
Questions for Review 9 - 30
Project 9 - 31

Lesson 10 : Assembly Operations

Synopsis 10 - 1
Overview of this Lesson 10 - 1
Assembly Information 10 - 2
Assembly Features 10 - 4
  Creating Assembly Features 10 - 4
Assembly Display Management 10 - 5
Assembly and Part Modifications 10 - 7
  Active Components and Visibility 10 - 7
  Changing Part Dimensions 10 - 8
  Adding another Assembly Feature 10 - 9
  Changing Feature Visibility 10 - 11
  Changing the Active Component 10 - 11
Part Creation in Assembly Mode 10 - 13
Exploding the Assembly 10 - 15
Component Display Style 10 - 18
  Modifying Component Display Styles 10 - 18
  Modifying the Explode State 10 - 20
Sections 10 - 22
Assembly Drawings 10 - 23
Questions for Review 10 - 26
Project 10 - 28
Lesson 11: Sweeps and Blends

Synopsis
Overview of this Lesson
Sweeps
Sweep #1 - The S-Bracket
Alternate Method for Creating Sweep
Extending the Trajectory
Sweep #2: The Lawn Sprinkler
Creating an Axis Pattern
Creating a Sketched Hole
Blends
Parallel Blend
The Shell Command
Rotational Blend
Conclusion
Questions for Review
Exercises

Appendix: Creo Parametric Customization

Synopsis
Overview
Configuration Settings
Configuration Files (config.pro)
The Configuration File Editor
Adding Settings to config.pro
Saving Your config.pro Settings
Loading a Configuration File
Deleting Configuration Options
Checking Your Configuration Options
Customizing the Toolbars
Customizing Ribbon Tabs and Groups

Index