

Creo™ Parametric 2.0 Tutorial and Multimedia DVD

Roger Toogood, Ph.D., P. Eng.
Jack Zecher, P.E.



Visit the following websites to learn more about this book:



[amazon.com](https://www.amazon.com)

[BARNES & NOBLE](https://www.barnesandnoble.com)

[Google books](https://books.google.com)

TABLE OF CONTENTS

Preface	i
Notes for the Creo Parametric 2.0 Edition	ii
Note to Instructors	ii
Acknowledgments	iii
About the DVD	vi
Table of Contents	vii

Introduction to Creo Parametric

A Few Words Before You Dive In...	Intro - 1
What <i>IS</i> 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 1-1 Common Creo Parametric Mouse Functions (3D)	1 - 10
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
Anatomy of an Assembly	1 - 36
Helpful Hint: Managing Multiple Windows	1 - 37
An Assembly BOM (Bill of Materials)	1 - 38
Modifying the Assembly	1 - 38
Exploding an Assembly	1 - 40
Opening Parts in an Assembly	1 - 41
Obtaining Hard Copy	1 - 41
Leaving Creo Parametric	1 - 42
Questions for Review	1 - 44
Exercises	1 - 45

Lesson 2 : Creating a Simple Object (Part I)

Synopsis	2-1
Overview of this Lesson	2-1
Creating a Simple Part	2-2
Creating and Naming the Part	2-2
Create Datum Planes	2-3
Part Modeling Feature Overview	2-4
Introducing Sketcher	2-5
Table 2-1 Implicit Constraints in Sketcher	2-8
Two Ways to use Sketcher to Create Shaped Features	2-8
Table 2-2 Steps to create a sketched feature	2-9
Creating a Sketched Curve	2-9
Setting Sketch Orientation	2-10
The Sketcher Ribbon	2-13
Table 2-3 Explicit Constraints in Sketcher	2-15
Creating the Sketch	2-15
Weak vs Strong Dimensions	2-17
Sketcher Diagnostic Functions	2-19
Creating a Solid Protrusion	2-20
The Extrude Dashboard	2-21
Saving the Part	2-24
Creating an Extruded Cut	2-25
Using Part Templates	2-30
Questions for Review	2-32
Exercises	2-33

Lesson 3 : Creating a Simple Object (Part II)

Synopsis	3 - 1
Overview of this Lesson	3 - 1
Retrieving a Part	3 - 2
Creating a Hole	3 - 3
Creating a Chamfer	3 - 8

Creating a Round	3 - 9
Exploring the Model	3 - 12
Configuring the Model Tree	3 - 12
Naming Features	3 - 13
Exploring Parent/Child Relations	3 - 14
Modifying Dimensions	3 - 16
Creating Feature Relations	3 - 18
More about relations:	3 - 21
Considering Design Intent	3 - 22
Design Intent Alternative #1	3 - 23
Design Intent Alternative #2	3 - 23
Design Intent Alternative #3	3 - 24
More Sketcher Tools	3 - 25
The <i>Modify</i> Command	3 - 25
Sketcher Relations	3 - 26
Sketcher Preferences	3 - 26
Using <i>Redo</i>	3 - 27
Creo Parametric Files Saved Automatically	3 - 28
Questions for Review	3 - 29
Exercises	3 - 30
Project	3 - 33

Lesson 4 : Revolved Protrusions, Mirror Copies, Rounds, and Chamfers

Synopsis	4 - 1
Overview of this Lesson	4 - 1
Creating the Base Feature	4 - 2
Creating a Revolved Protrusion	4 - 7
Adding and Mirroring a Cut	4 - 10
Creating a Mirror Copy	4 - 11
Creating Holes	4 - 13
Having Problems Mirroring?	4 - 14
Creating Rounds	4 - 14
Using Edge Sets with <i>Chamfer</i>	4 - 16
Saving the Part	4 - 18
Model Analysis Tools	4 - 19
Exploring the Model, or “What Can Go Wrong?”	4 - 21
Questions for Review	4 - 24
Exercises	4 - 25
Project	4 - 29

Lesson 5 : Modeling Utilities and the 3 R’s

Synopsis	5 - 1
Overview of this Lesson	5 - 1
Obtaining Information about the Model	5 - 2
The Regeneration Sequence	5 - 3

The Feature List	5 - 3
The Model Tree	5 - 4
Parent/Child Relations	5 - 5
Suppressing and Resuming Features	5 - 7
Suppressing versus Hiding	5 - 9
Modifying Feature Definitions	5 - 9
① Changing the shape of a sketch (<i>Edit Definition</i>)	5 - 11
② Changing a Feature Reference (<i>Edit References</i>)	5 - 12
③ Changing the Sketcher Constraints (<i>Edit Definition</i>)	5 - 13
④ Changing a Feature Reference (<i>Edit References</i>)	5 - 14
⑤ Changing Feature Attributes (<i>Edit Definition</i>)	5 - 15
⑥ Changing the Regeneration Sequence using <i>Reorder</i>	5 - 16
⑦ Changing the Insertion Point	5 - 17
Conclusion	5 - 18
Questions for Review	5 - 19
Exercises	5 - 20
Project	5 - 23

Lesson 6 : Datum Planes and Sketcher Tools

Synopsis	6 - 1
Overview of this Lesson	6 - 1
Overview of Datum Planes and Axes	6 - 2
Creating a Datum Plane and Datum Axis	6 - 4
Creating the <i>Cutter</i> Base Feature	6 - 6
Creating a Coaxial Hole	6 - 10
First Tooth - Offset Datum	6 - 10
Second Tooth - Normal and Tangent Datum	6 - 12
Third Tooth - Using Make Datums	6 - 14
Exploring the Model	6 - 18
Considering <i>Design Intent</i>	6 - 19
Questions for Review	6 - 20
Exercises	6 - 21
Project	6 - 22

Lesson 7 : Patterns and Copies

Synopsis	7 - 1
Overview of this Lesson	7 - 1
Patterned Features	7 - 2
Naming Dimension Symbols	7 - 3
Creating a Uni-directional Pattern	7 - 4
Creating a Bi-directional Pattern	7 - 6
Creating a Simple Radial Pattern	7 - 8
Setting up Pattern Relations	7 - 10
A Pattern of Grouped Features	7 - 12
Radial Patterns of Shaped Features	7 - 13

Radial Pattern using <i>Make Datum</i> as Sketching Plane	7 - 14
Radial Pattern using <i>Make Datum</i> as Reference Plane	7 - 17
Copying Features with <i>Paste</i> and <i>Paste Special</i>	7 - 20
Copying using <i>Paste</i>	7 - 21
Copying using <i>Paste Special</i>	7 - 24
<i>Paste Special</i> Using Translated and Rotated copies	7 - 28
Design Considerations	7 - 31
Questions for Review	7 - 33
Exercises	7 - 34
Project	7 - 35

Lesson 8 : Engineering Drawings

Synopsis	8 - 1
Overview of this Lesson	8 - 1
The Drawing Environment	8 - 3
Drawing Interface	8 - 3
Mouse Controls in Drawing Mode	8 - 5
Drawing Ribbon and Drawing Tree	8 - 5
Layout	8 - 6
Table	8 - 6
Annotate	8 - 6
Sketch	8 - 7
Review	8 - 7
<i>Shown vs Created</i> Dimensions	8 - 8
Table 8.1 The Mysteries of Model vs Draft Dimensions	8 - 8
Dimension Properties	8 - 9
Exploring Associativity	8 - 10
The L-Bracket	8 - 11
Creating the Part	8 - 11
Changing Part Units	8 - 11
Creating the Drawing of the L-Bracket	8 - 13
① Create the Drawing File	8 - 13
② Adding Views	8 - 13
③ Setting View Display Mode	8 - 16
④ Adding Dimensioning Detail	8 - 16
⑤ Dimension Cosmetics	8 - 18
⑥ Creating a Note	8 - 21
Exploring Associativity	8 - 21
Printing and Exporting the Drawing	8 - 24
Using Drawing Templates	8 - 25
The Pulley	8 - 27
Creating the Pulley	8 - 27
Creating the Drawing	8 - 29
① Selecting a Formatted Sheet	8 - 29
② Creating the Primary View	8 - 30
③ Add a Full Section View	8 - 30

④ Modify the Section View Display	8 - 32
⑤ Adding a Detail View	8 - 33
⑥ Adding Dimension Details	8 - 34
⑦ Improving the Esthetics	8 - 35
⑧ Changing Drawing Options	8 - 36
⑨ Adding Notes with Parameters	8 - 36
⑩ Creating Dimensions	8 - 38
Conclusion	8 - 39
Questions for Review	8 - 40
Exercises	8 - 42
Project	8 - 43

Lesson 9 : Assembly Fundamentals

Synopsis	9 - 1
Overview of this Lesson	9 - 1
Collecting the Assembly Components	9 - 2
Assembly Constraints	9 - 2
<i>Default</i> Constraint	9 - 4
<i>Coincident</i> Constraint	9 - 4
<i>Normal</i> Constraint	9 - 5
<i>Distance</i> Constraint	9 - 6
<i>Parallel</i> Constraint	9 - 7
<i>Angle Offset</i> Constraint	9 - 7
<i>Tangent</i> Constraint	9 - 7
<i>Fix</i> Constraint	9 - 7
Assembly Design Issues	9 - 7
Assembling the Components	9 - 9
Creating a Subassembly	9 - 9
The 3D Dragger	9 - 11
Using <i>Allow Assumptions</i>	9 - 14
Creating the Main Assembly	9 - 16
Adding a Subassembly	9 - 17
Using <i>Copy</i> 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 - 24
Questions for Review	10 - 28
Project	10 - 30

Lesson 11 : Sweeps and Blends

Synopsis	11 - 1
Overview of this Lesson	11 - 1
Sweeps	11 - 2
Sweep #1 - The S-Bracket	11 - 3
Alternate Method for Creating Sweep	11 - 5
Extending the Trajectory	11 - 6
Sweep #2: The Lawn Sprinkler	11 - 8
Creating an <i>Axis</i> Pattern	11 - 9
Creating a Sketched Hole	11 - 11
Blends	11 - 12
Parallel Blend	11 - 13
The <i>Shell</i> Command	11 - 16
Rotational Blend	11 - 17
Conclusion	11 - 21
Questions for Review	11 - 22
Exercises	11 - 23

Appendix : Creo Parametric Customization

Synopsis	A - 1
Overview	A - 1
Configuration Settings	A - 1
Configuration Files (<i>config.pro</i>)	A - 3
The Configuration File Editor	A - 4
Adding Settings to <i>config.pro</i>	A - 5
Saving Your <i>config.pro</i> Settings	A - 7
Loading a Configuration File	A - 8
Deleting Configuration Options	A - 8
Checking Your Configuration Options	A - 8
Customizing the Toolbars	A - 9

Customizing Ribbon Tabs and Groups A - 9