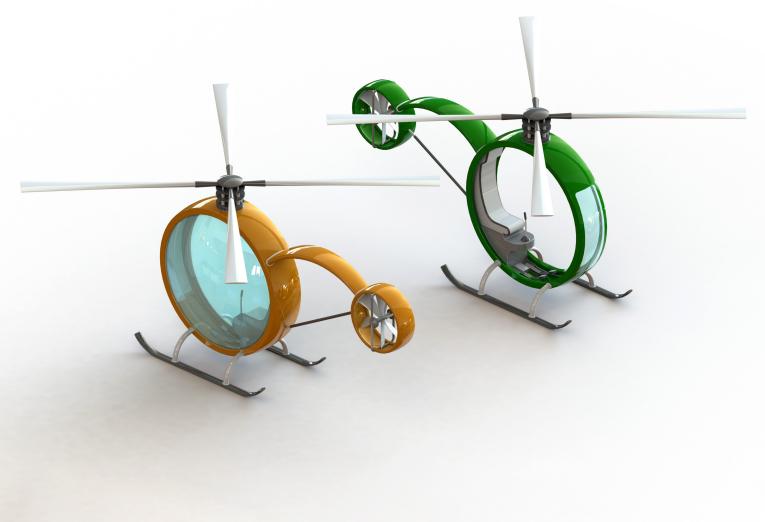
SOLIDWORKS 2021 Advanced Techniques

Mastering Parts, Surfaces, Sheet Metal, SimulationXpress, Top Down Assemblies, Core & Cavity Molds



Paul Tran CSWE, CSWI

Visit the following websites to learn more about this book:









Table of Contents

Introduction	The 3 references planes The toolbars The system feedback symbols The status bar 2D sketch examples 3D feature examples	XXIII XXIV XXIV XXVI XXVI XXVII
	Advanced Modeling Topics	
Chapter 1	Introduction to 3D Sketch Tools Needed Creating a 3D Sketch Completing the profile Adding dimensions Adding the sketch fillets Creating the swept feature Questions for review Exercise: Sweep with 3D Sketch Exercise: 3D Sketch & Planes Exercise: 3D Sketch & Composite Curve	1-1 1-2 1-3 1-4 1-5 1-6 1-7 1-8 1-9 1-10 1-17
Chapter 2	Plane Creation Advanced Topics Tools Needed Revolving the base Creating a tangent plane Creating a flat surface Extruding a cut Creating an at-angle plane Showing the sketches Creating a coincident plane Creating a parallel plane Creating the recess Creating an offset-distance plane Creating the bore holes Creating a perpendicular plane	2-1 2-1 2-2 2-3 2-4 2-5 2-6 2-7 2-8 2-9 2-10 2-11 2-12 2-12 2-13

	Creating the side-grips	2-14
	Creating a circular pattern of the grips	2-15
	Creating a Mid-Plane	2-17
	Adding fillets to all edges	2-19
	Questions for Review	2-20
	Exercise: Create New Planes	2-22
Chapter 3	Advanced Modeling	3-1
	5/8" Spanner	3-1
	Tools needed	3-2
	Opening the spanner sketch document	3-3
	Creating the transition sketch	3-4
	Creating a new work plane	3-6
	Creating the closed-end sketch	3-7
80	Extruding the closed-end feature	3-7
S. S. S. THER	Adding a 12-sided polygon hole	3-8
	Creating the recess profile	3-9
	Mirroring the recessed feature	3-10
	Adding fillets	3-11
	Adding text	3-13
	Extruding the text	3-14
	Questions for Review	3-17
	Exercise: Circular text wraps	3-19
Chapter 4	Sweep with Composite Curves	4-1
Chapter 1	Helical Extension Spring	4-2
	Tools needed	4-2
1	Converting the circle into a helix	4-3
	Creating a 2-degree plane	4-4
	Sketching the large loop	4-5
	Sketching the large hook	4-5
C	Creating a parallel plane	4-6
	Creating a Composite Curve	4-8
	Sweeping the profile along the path	4-11
	Other spring examples	4-12
	Questions for review	4-13
	Exercise: Circular Spring – 180 deg.	4-14
and the second	Using Variable Pitch	4-17
	Multi-Pitch Spring with Closed Ends	4-18
	Tools Needed	4-18

	Creating the base sketch Creating a helix using variable pitch Sweeping the profile along the path Creating a trimmed sketch Extruding a cut Questions for Review Exercise: Projected Curve & Composite Curve	4-19 4-19 4-21 4-22 4-22 4-23 4-24
Chapter 5	Advanced Modeling with Sweep & Loft Water Pump Housing Tools Needed Understanding the draft options Extruding the base with draft	5-1 5-2 5-2 5-3 5-4
	Sketching the upper inlet port Revolving the upper inlet port	5-5 5-5
	Adding fillets	5-6 5-7
	Creating offset-distance planes Creating a loft feature	5-7 5-10
	Creating a fort feature Creating the mounting bosses	5-10 5-11
dia julia	Sketching the rear inlet port	5-12
1-0-	Revolving the rear inlet port	5-12
	Adding face Fillets	5-13
	Mirroring the rear inlet port	5-15
	Shelling the part	5-16
	Adding a rib	5-17
	Mirroring the rib	5-18
	Adding fillets	5-19
Chapter 6	Loft vs. Sweep	6-1
	Water Meter Housing	6-2
	Tools Needed Skataking the left mafile	6-2 6-3
	Sketching the loft profile Constructing loft profiles / features	6-5
	Creating the inlet feature	6-6
	Constructing the centerline parameter	6-10
	Creating the outlet loft feature	6-11
	Shelling the part	6-13
	Extruding the left / right brackets	6-14
	Constructing the upper ring	6-15
	Adding fillets	6-17
	Adding chamfers	6-18

	Questions for Review Exercise: Loft	6-19 6-20
Chapter 7	Loft with Guide Curves Waved Washer Tools Needed Creating the construction profile Creating an offset distance plane Positioning the derived sketch Creating a curve through reference points Sketching the loft sections Creating the loft section using derived sketch Creating a loft with guide curve Hiding the construction sketches Questions for review Exercise: Using Curve Driven Pattern	7-1 7-2 7-2 7-3 7-4 7-5 7-7 7-7 7-10 7-11 7-12 7-13
	Advanced Sweep 3D Sketch Path Tools Needed Creating the sweep path Creating the sweep profile Creating a sweep feature Creating a circular Sketch pattern Converting to construction geometry Creating a derived sketch Creating a 3D sketch Creating the sweep feature Exercise: Using Curve Through Reference Points	7-13 7-19 7-20 7-20 7-21 7-22 7-23 7-25 7-26 7-27 7-28 7-32 7-33
Chapter 8	Using Surfaces Advanced Modeling Tools Needed Constructing a new work plane Sketching the loft profiles Creating a surface-loft Splitting the surface Deleting surfaces Thickening the surface Calculating the angle between the faces	8-1 8-2 8-2 8-3 8-3 8-6 8-7 8-8 8-9 8-10

	Adding a full round fillet	8-12
	Sketching the slot contours	8-13
	Extruding cut the contour	8-15
	Questions for Review	8-17
	Lofted Surface	8-19
	Creating new offset planes	8-19
	Sketch the first profile	8-20
	Selecting the loft profiles	8-21
	Lofting between the profiles	8-22
	Creating a revolved sketch	8-23
	Copying the revolved surface	8-24
	Trimming the base part	8-25
	Hiding the surfaces	8-25
	Filling the openings with surface-fill	8-26
	Creating a Surface-Knit	8-29
	Adding fillets	8-30
	Creating a solid from the surface model	8-31
	Removing the upper half	8-32
	Questions for Review	8-36
	Exercise: Loft & Delete Face	8-37
Chapter 9	Offset Surface & Ruled Surface	9-1
Chapter 9	Offset Surface & Ruled Surface Tools Needed	9-1 9-2
Chapter 9		9-2 9-3
Chapter 9	Tools Needed	9-2
Chapter 9	Tools Needed Using offset & ruled surface options	9-2 9-3
Chapter 9	Tools Needed Using offset & ruled surface options Creating the base loft	9-2 9-3 9-4
Chapter 9	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines	9-2 9-3 9-4 9-5
Chapter 9	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces	9-2 9-3 9-4 9-5 9-6 9-7 9-8
Chapter 9	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface	9-2 9-3 9-4 9-5 9-6 9-7 9-8
Chapter 9	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface Knitting the 2 surfaces	9-2 9-3 9-4 9-5 9-6 9-7 9-8
Chapter 9	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface Knitting the 2 surfaces Showing the solid body	9-2 9-3 9-4 9-5 9-6 9-7 9-8 9-10
Chapter 9	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface Knitting the 2 surfaces Showing the solid body Creating the surface cut	9-2 9-3 9-4 9-5 9-6 9-7 9-8 9-10
	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface Knitting the 2 surfaces Showing the solid body Creating the surface cut Exercise: Advanced Surfaces Exercise: Advanced Surfacing Techniques	9-2 9-3 9-4 9-5 9-6 9-7 9-8 9-10 9-10 9-13
Chapter 9 Chapter 10	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface Knitting the 2 surfaces Showing the solid body Creating the surface cut Exercise: Advanced Surfaces	9-2 9-3 9-4 9-5 9-6 9-7 9-8 9-10 9-13 9-15
	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface Knitting the 2 surfaces Showing the solid body Creating the surface cut Exercise: Advanced Surfaces Exercise: Advanced Surfacing Techniques Advanced Surfaces Computer Mouse	9-2 9-3 9-4 9-5 9-6 9-7 9-8 9-10 9-13 9-15
	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface Knitting the 2 surfaces Showing the solid body Creating the surface cut Exercise: Advanced Surfaces Exercise: Advanced Surfacing Techniques Advanced Surfaces	9-2 9-3 9-4 9-5 9-6 9-7 9-8 9-10 9-13 9-15
	Tools Needed Using offset & ruled surface options Creating the base loft Creating split lines Creating offset surfaces Creating a ruled surface Knitting the 2 surfaces Showing the solid body Creating the surface cut Exercise: Advanced Surfaces Exercise: Advanced Surfacing Techniques Advanced Surfaces Computer Mouse	9-2 9-3 9-4 9-5 9-6 9-7 9-8 9-10 9-13 9-15

	Trimming the surfaces	10-5
	Mirroring the surfaces	10-6
	Creating filled surfaces	10-7
	Creating a new plane	10-9
	Making a 3-Point Arc	10-9
	Creating a planar surface	10-12
	Creating a knit surface	10-13
	Using Filled Surfaces	10-15
	Patch with Curvature Controls	10-15
	Tools Needed	10-16
(Traper: A) - Stonday	Enabling the surfaces toolbar	10-17
	Creating a planar surface	10-18
	Creating a surface fill with tangent control	10-18
	Creating a surface fill with curvature control	10-20
	Knitting all surfaces	10-21
	Patch Types	10-22
	Questions for Review	10-24
	Boundary and Freeform Surfaces	10-25
	Creating the 1st boundary surface	10-25
	Creating the 2nd boundary surface	10-28
	Creating the Freeform feature	10-30
Chantor 11	Surface ve Solid Modeling	11-1
Chapter 11		11-1
	Safety Helmet Tools Needed	11-2
	Constructing the body of Helmet	11-2
	·	
30/1/	Creating a new work plane	11-4
	Sketching the sweep-profile	11-4 11-5
	Creating the sweep path	11-6
	Adding a planar surface	11-6
	Knitting the three surfaces bodies into one	11-0
	Creating a section view	
	Adding an extruded cut feature	11-7
	Adding a revolve cut feature	11-9
	Adding the side cut features	11-10
	Creating the Cutout slot	11-11
	Creating the sweep cut	11-13
1	Adding fillets	11-13
	Exercise: Advanced Loft – Turbine Blades	11-15
	Exercise: Advanced Sweep – Candle Holder	11-16

	Advanced: Final Exam	11-23
Chapter 12	SimulationXpress	12-1
	Using the Analysis Wizard	12-2
3	Tools Needed	12-2
	Starting SimulationXpress	12-3
	Setting up the units	12-4
Contract (a) State (a) Sta	Adding a fixture	12-5
13mm ii 12mm ii 13mm ii 13mm ii 13mm ii 13mm ii	Applying a force	12-7
	Selecting the material	12-8
	Analyzing the model	12-9
	Viewing the Results	12-10
no Mara pais 7 Sala-Mil	Creating the report	12-12
4.50 mill 5.50 mill 5.50 mill 5.50 mill 5.50 mill 5.50 mill 6.50 m	Generating the eDrawings file	12-16
3.594-000 3.394-000 3.394-007 3.794-007 3.198-007	Questions for Review	12-19
To company 2 of Produc	Exercise 1: SimulationXpress: Force	12-20
	Exercise 2: SimulationXpress: Pressure	12-21
	Sheet Metal Topics	
Chapter 13	Sheet Metal Parts	13-1
Chapter 13	Sheet Metal Parts Post Cap	13-1 13-2
Chapter 13		
Chapter 13	Post Cap	13-2
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange	13-2 13-2
Chapter 13	Post Cap Tools Needed Starting with the Base Profile	13-2 13-2 13-3
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile	13-2 13-2 13-3 13-3 13-4 13-5
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern	13-2 13-2 13-3 13-3
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend Adding Holes	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6 13-7 13-9
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend Adding Holes Making the Flat Pattern	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-7 13-9 13-12
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend Adding Holes Making the Flat Pattern Using Sheet Metal Costing	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6 13-7 13-9 13-12
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend Adding Holes Making the Flat Pattern Using Sheet Metal Costing Inputting the information	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6 13-7 13-9 13-12 13-13
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend Adding Holes Making the Flat Pattern Using Sheet Metal Costing Inputting the information Setting the Baseline	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6 13-7 13-9 13-12 13-13 13-14
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend Adding Holes Making the Flat Pattern Using Sheet Metal Costing Inputting the information	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6 13-7 13-9 13-12 13-13
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend Adding Holes Making the Flat Pattern Using Sheet Metal Costing Inputting the information Setting the Baseline Questions for Review Vents	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6 13-7 13-9 13-12 13-13 13-14 13-15 13-17
Chapter 13	Post Cap Tools Needed Starting with the Base Profile Extruding the Base Flange Creating an Edge Flange Editing the Edge Flange Profile Viewing the Flat Pattern Changing the Fixed Face Creating a Sketch Bend Adding Holes Making the Flat Pattern Using Sheet Metal Costing Inputting the information Setting the Baseline Questions for Review	13-2 13-2 13-3 13-3 13-4 13-5 13-6 13-6 13-7 13-9 13-12 13-13 13-14 13-15

	Extruding the Base-Flange	13-21
	Creating the Miter-Flanges	13-22
	Flattening the Part	13-24
	Creating a new Forming Tool	13-25
	Other Rectangle Options	13-26
	Extruding the Base	13-27
	Building the louver body	13-27
	Creating the Positioning Sketch	13-31
	Saving the Form Tool	13-33
	Applying the Form Tool	13-34
	Positioning the Form Tool	13-35
	Adding a mounting hole	13-36
	Creating a Linear Pattern	13-37
	Creating an Axis	13-38
	Creating a Circular Pattern	13-39
	Questions for Review	13-40
Chapter 14	Sheet Metal Forming Tools	14-1
	Button with Slots	14-2
	Tools Needed	14-2
	Creating the Base Block	14-3
	Revolving the Body	14-4
	Sketching Slot Profiles	14-5
	Creating the Split Lines	14-7
	Adding more fillets	14-9
	Inserting the forming tool feature	14-9
	Saving the forming tool	14-10
	Questions for Review	14-12
	Designing Sheet Metal Parts – Mounting Tray	14-13
	Tools Needed	14-14
	Starting with the Base Sketch	14-15
	Creating an Edge Flange	14-16
	Adding Cut features	14-17
	Extruding a cut	14-17
	Using the Unfold Command	14-18
	Using the Fold Command	14-20
	Inserting a Sheet Metal Forming Tool	14-23
	Locating the Bridge Lance	14-25
	Creating the Linear Pattern of the Bridge Lance	14-26
	Mirroring the Body	14-27
	Adding Chamfers	14-30

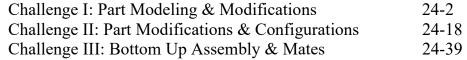
	Switching to the Flat Pattern	14-31
	Questions for Review	14-32
Chapter 15	Sheet Metal Conversions	15-1
	From IGES to SOLIDWORKS	15-2
	Tools Needed	15-2
	Opening an IGES Document	15-3
	Creating the Rips	15-4
	Inserting the Sheet Metal Parameters	15-5
	Adding Fillets	15-6
	Switching to a Flat Pattern	15-7
	Questions for Review	15-8
	Sheet Metal Gussets	15-9
	Opening a sheet metal document	15-9
4	Creating a gusset	15-9
4	Viewing the resulted gusset	15-11
	Mirroring the gusset	15-12
	Flat Pattern Stent	15-13
	Tools Needed	15-14
	Converting to Sheet Metal	15-16
XXXXX	Unfolding the Part	15-16
	Adding the Sketch Pattern	15-17
	Folding the Part	15-19
	Creating a new Configuration	15-20
	Adding Fillets	15-20
	Switching to Flatten Mode	15-21
	Questions for Review	15-22
	Exercise: Stent Sample - Sheet Metal Approach	15-23
Chapter 16	Working with Sheet Metal STEP Files	16-1
<u>-</u>	Tools Needed	16-2
	Opening an Assembly Step File	16-3
	Mating the components	16-4
	Adding the Sheet Metal tool tab	16-7
	Inserting Sheet Metal parameters	16-8
	Viewing the Flat Pattern	16-9
	Converting other components	16-9
	Using the Hole Series	16-11
	Using the Hole Wizard	16-13
	Adding the Smart Fasteners	16-15
	Creating an Exploded View	16-17

	Adding Parts to the Toolbox Library	16-18
	Starting the Toolbox Settings Utility	16-18
	Activating Toolbox	16-21
	Locating the new part	16-22
	Viewing the new part	16-22
	Adding a Part Number and Description	16-23
Chapter 17	Advanced Weldments	17-1
	Weldments Platform	17-2
A	Tools Needed	17-2
	Adding the weldments toolbar	17-3
	Adding the structural members	17-4
	Viewing the overlapped areas	17-8
NAME OF THE PARTY	Trimming the overlapped areas	17-9
V	Updating the cut list	17-12
	Using Weldments – Structural Members	17-14
	Enabling the Weldment Toolbar	17-14
	Adding Structural Members	17-15
	Setting the Corner Treatments	17-15
	Adding Structural Members to Contiguous Groups	17-16
	Adding Structural Members to the Parallel Groups	17-17
	Trimming the Structural Members	17-19
	Adding the foot pads	17-26
	Adding the Gussets	17-27
	Adding the Fillet Beads	17-29
	Viewing the Weldment Cut List	17-31
	Updating the Cut List	17-32
	Creating a drawing	17-33
	Mold Tools Design Topics	
Chapter 18	Creating a Core and Cavity	18-1
	Linear Parting Lines	18-2
	Tools Needed	18-2
	Opening an existing Parasolid document	18-3
	Creating the Parting Lines	18-4
	Creating the Shut-Off Surfaces	18-5
o like.	Creating the Parting Surfaces	18-6
	Sketching the profile of the mold blocks	18-7
	Creating the Tooling Split	18-8

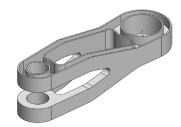
	Saving the bodies as part files	18-10
	Separating the 2 blocks	18-11
	Exercise: Linear Parting Lines	18-13
	Questions for Review	18-19
Chapter 19	Non-Planar Parting Lines	19-1
	Mold-Tooling Design	19-2
	Tools Needed	19-2
	Enabling the Mold Tools toolbar	19-3
	Creating the Parting Lines	19-4
	Creating the Shut-Off Surfaces	19-5
	Creating the Parting Surfaces	19-6
	Creating a Ruled Surface	19-7
	Creating the patches	19-9
4	Knitting the surfaces	19-13
	Trimming the bottom of the ruled surface	19-15
	Creating the Tooling Split sketch	19-16
	Separating the solid bodies	19-18
	Making the body transparent	19-19
	Creating Slides and Cores	19-21
	Tools Needed	19-22
	Opening a part document	19-23
	Analyzing the undercuts	19-23
THE STATE OF THE S	Analysis parameters explained	19-24
	Scaling the part	19-25
ALL DE	Creating the parting lines	19-26
	Creating the parting surfaces	19-27
	Creating a new sketch	19-28
	Creating the tooling split	19-29
	Finalizing the block sizes	19-29
	Renaming the bodies and assigning materials	19-32
	Creating the front slide core	19-32
	Creating the back slide core	19-34
	Creating an exploded view	19-35
Chapter 20	Top Down Assembly - Part 1	20-1
	Miniature Vise	20-2
9	Tools Needed	20-2
	Creating the Base part	20-3
	Adding the side flanges	20-5
	Creating an offset distance plane	20-7
	Creating the 3D Guide Curves	20-9

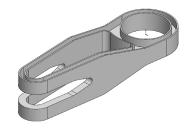
	Level 4: Final Exam	22-24
	Repair Errors & External References	22-16
	Understanding and Repairing Part Errors	22-8 22-9
	Rebuilding the model Questions for Review	22-7
	Repairing the Sketches Rebuilding the model	22-5 22-7
	Understanding the External Symbols	22-4
	Removing External References	22-3
	Understanding & Removing External References	22-3
	External Reference Symbols	22-2
Chapter 22	External References & Repair Errors	22-1
Chart a 22	Fatamal Defense on C David' F	22.4
	Questions for Review	21-25
	Inserting other components	21-23
	Viewing the External Reference Symbols	21-22
	Applying dimension changes	21-20
	Exiting the Edit Component Mode	21-20
0.	Adding an Offset-Distance plane	21-14
(OFFI	Adding another mounting Flange	21-13
	Creating the Transition Body	21-12
۸ ا	Creating the 2nd Component	21-10
	Saving as Virtual Component	21-10
	Adding Chamfers and Fillets	21-8
. 1	Adding the Mounting Holes	21-6
	Adding the Inlet Flange	21-5
	Creating the 1st Component	21-4
	Starting a New Assembly Template	21-3
	Tools Needed	21-2
Chapter 21	Water Control Valve	21-1
Chapter 21	Top-Down Assembly - Part 2	21-1
	Questions for Review	20-32
	Creating a Section View	20-29
	Creating the Internal threads	20-26
	Extruding the clamp block	20-23
	Creating the clamp block	20-22
	Sketching the Guide Curve	20-20
	Using the offset entities command	20-15
	Creating a new component: The slide jaw	20-14
	Creating the fixed jaw clamp	20-11

Chapter 23	Using Appearances	23-1
	Modeling diamond knurls	23-1
	Applying the knurl appearance	23-5
	Applying wire mesh appearance	23-8
	Applying the Car-Paint Appearance	23-11
	Flatten Surfaces	23-16
	Exercise: Flattening a shoe sole	23-20
Certification	Practice for the CSWP Mechanical Design Exam	m 24-1









Glossary, Index, and SOLIDWORKS 2021 Quick-Guide

Quick Reference Guide to SOLIDWORKS 2021 Command Icons and Toolbars.