Mastering Surface Modeling with SOLIDWORKS 2022

Basic through Advanced Techniques



Lani Tran, CSWE











TABLE OF CONTENTS

Chapter 1: Intro	duction to Surfaces	1-1
	Solids vs. surfaces	1-1
	Patching with continuity	1-2
	Contact, tangent, and curvature continuous	1-2
	When to use surfaces	1-3
	When not to use surfaces	1-3
	The spline handles	1-4
	Check your surface model frequently	1-5
	The best approach	1-6
Chapter 2: Surfa	acing Basics	2-1
•	Extruded surface	2-1
	Creating a curve through reference points	2-2
	Creating the planar surfaces	2-3
	Knitting the surfaces	2-4
	Saving your work	2-4
	Revolved surface	2-5
	Creating a section view	2-6
	Adding fillets	2-6
	Swept surface	2-8
	Sketching the sweep path	2-8
	Creating a swept surface	2-9
	Lofted surface	2-10
	Sketching the 3rd profile	2-10
	Creating a lofted surface	2-11
	Boundary surface	2-13
	Sketching the 3D splines	2-13
	Creating a boundary surface	2-16
	Exercise: Extrude and Trim Surfaces	2-18
Chapter 3: Usin	g Boundary and Lofted Surface	3-1
	Starting a new part document	3-1
	Creating the 1st reference plane	3-3
	Sketching the 1st boundary profile	3-3
	Sketching the 2nd boundary profile	3-4

	Comparing methods Creating a boundary surface	3-5 3-6
	Creating the 2nd reference plane	3-7
	Constructing the 1st trim sketch	3-8
	Trimming the bottom	3-9
	Constructing a split sketch	3-10
	Creating a spilt line feature	3-11
	Deleting faces	3-12
	Thickening the surface model	3-13
	Adding fillets	3-14
	RealView graphics	3-15
	Ambient occlusion	3-16
	Using Surface Trim & Loft Lofted Surface	3-17
	Creating a revolved surface	3-17
	Trimming with a sketch	3-18
	Making a surface offset	3-18
	Trimming with another sketch	3-19
	Creating a lofted surface	3-20
	Knitting all surfaces	3-21
	Exercise: Creating a Lofted Surface	3-23
Chapter 4: M	ultibody Designs	4-1
	Opening a part document	4-1
	Creating a revolved surface	4-1
	Creating a trimmed sketch	4-2
	Adding Thickness	4-4
	Creating a split line feature	4-4
	Making an offset surface	4-5
	Creating a raised label area	4-5
	Creating a 2 nd raised feature	4-6
	Adding a new plane	4-6
	Creating a boss feature	4-7
	Adding fillets	4-8
	Adding a pin hole	4-9
	Mirroring features	4-10
	Creating the handle sketch	4-10
	Extruding the handle	4-11
	Adding fillets	4-11
	Adding a hole	4-12
	Adding a fillet	4-13
	Creating a pin	4-13
	Mirroring the pin	4-14

	Creating an exploded view	4-15
Chapter 5: Surfa	ace Creation	5-1
•	Creating the 1st sketch	5-1
	Creating the 2nd sketch	5-2
	Trimming the surfaces	5-3
	Mirroring a surface body	5-4
	Making the loft profiles	5-5
	Creating a lofted surface	5-6
	Making the fill profiles	5-7
	Creating two filled surfaces	5-8
	Creating a planar surface	5-9
	Knitting the surfaces	5-9
	Creating fillets	5-10
	Creating a split line feature	5-11
	Creating a face fillet with hold line	5-12
	Creating more fillets	5-13
	Boundary & Lofted Surface Exercise - Phone Case	5-14
	Opening a part document	5-14
	Creating a boundary surface	5-14
	Creating the 1st lofted surface	5-15
	Creating the 2 nd lofted surface	5-16
	Creating the 3 rd lofted surface	5-17
	Hiding the sketches	5-18
	Knitting the surface	5-19
	Exercise: Trim & Mirror Surfaces	5-20
Chapter 6: Using	g Filled, Knit & Boundary Surface	6-1
	Opening a part document	6-1
	Creating a boundary surface	6-2
	Creating a revolved surface	6-3
	Creating a filled surface	6-4
	Knitting the surfaces	6-5
	Creating a split line feature	6-6
	Changing the face color	6-7
	Shelling the model	6-8
	Enabling RealView graphics	6-8
	Using Deform Surface	6-9
	Creating a lofted surface	6-9
	Creating a deform feature	6-10
	Trimming to the final size	6-11

	Patching the bottom surface	6-12
	Knitting the surfaces	6-12
	Adding fillets	6-13
	Exercise: Boundary Surface	6-15
Chapter 7: Us	ing Trim, Thicken & Configurations	7-1
	Opening a part document	7-1
	Trimming the surfaces	7-1
	Mirroring a surface body	7-2
	Creating a lofted surface	7-3
	Patching up the two ends	7-4
	Creating the LED holes	7-5
	Making the power cord opening	7-6
	Knitting the surfaces	7-7
	Adding fillets	7-7
	Adding thickness	7-8
	Creating a recess cut	7-9
	Making a cut	7-10
	Creating the cover plate	7-10
	Using Configurations	7-15
	Adding a new configuration	7-15
	Modifying dimensions	7-16
	Adding another configuration	7-17
	Exercise: Trim, Knit & Patch Surfaces	7-18
Chapter 8: Cu	rved Driven Pattern & Flex Bending	8-1
	Opening a part document	8-1
	Creating a 3D sweep path	8-1
	Creating a swept surface	8-2
	Creating a curve driven pattern	8-3
	Stent Designs - Exercise 1	8-5
	Creating a planar surface	8-5
	Creating a rolled pattern	8-6
	Thickening a surface model	8-7
	Stent Designs - Exercise 2	8-8
	Creating a split sketch	8-9
	Creating a split line feature	8-10
	Deleting faces	8-10
	Adding thickness	8-11

	Creating an axis	8-12
	Creating a circular pattern	8-13
	Combining the solid bodies	8-14
	Stent Designs - Exercise 3	8-15
	Creating the base sketch	8-15
	Creating a planar surface	8-16
	Trimming with a sketch	8-16
	Thickening the surface	8-17
	Creating a flex bending feature	8-18
	Exercise: Pattern & Flex Bending	8-19
Chapter 9: S	urfaces & Solids- Hybrid Modeling	9-1
	Opening a part document	9-1
	Creating the extruded surfaces	9-1
	Trimming the surfaces	9-4
	Adding fillets	9-5
	Thickening the surface model	9-7
	Adding the inner support feature	9-8
	Creating an extruded cut	9-9
	Adding the support ribs	9-10
	Adding the mounting bosses	9-11
	Adding fillets	9-12
	Saving the housing right-half	9-13
	Mirroring the part	9-13
	Creating an extruded cut feature	9-15
	Saving the left half	9-16
	Adding the alignment pins	9-17
	Adding chamfers	9-18
	Saving the right half	9-18
	Inserting a part document	9-19
	Creating an exploded view	9-20
	Exercise: Hybrid Modeling	9-21
Chapter 10:	Mold Tools, Intersect & Core/Cavity	10-1
	Starting a new part document	10-1
	Creating a revolve surface	10-2
	Making the sketch of the sweep path	10-2
	Creating a new plane	10-3
	Creating a rib feature	10-4
	Circular patterning the rib	10-4
	Trimming the overlaps	10-5
	-	

	Adding thickness Adding fillets Adding material Scaling the model Creating the parting lines Creating the shut off surfaces Creating the parting surfaces Creating a tooling split Creating an exploded view Renaming and hiding the references	10-6 10-7 10-8 10-8 10-9 10-10 10-11 10-12 10-13
	Using Intersect Opening a part document Inserting another part document Moving the solid bodies Using the intersect option	10-15 10-15 10-15 10-16 10-17
	Exercise: Core and Cavity Creation	10-19
Chapter 11: \$	Opening a part document Creating the lofted surfaces Patching the raised feature Patching the corner of the keyway Using the filled surface command Using the lofted surface command Using the boundary surface command Creating the additional curves Creating a loft with guide curves Removing features Deleting holes Removing features Knitting the surfaces Assigning material Calculating the mass	11-1 11-2 11-3 11-5 11-6 11-7 11-8 11-9 11-10 11-11 11-12 11-14 11-15 11-15
	Exercise: Surface Repair & Patches	11-17
Lesson 12: R	endering with PhotoView 360 Opening an assembly document Enabling PhotoView 360 Changing the scene Enabling the preview window	12-1 12-1 12-1 12-2 12-3

Setting the output image size	12-3
Creating the rendering	12-4
Increasing the image quality	12-5
Quadrupling the image quality	12-6
Exercise: Rendering with PhotoView 360	12-8
Using Display States	12-12
Creating the 1st display state	12-12
Changing the appearances	12-13
Adding other display states	12-14
Toggling between display states	12-16

Glossary Index



Designed using SOLIDWORKS