

Includes
3DEXPERIENCE Platform
Certification Exams

Official Guide to Certified **SOLIDWORKS® Associate Exams:** **CSWA, CSWA-SD, CSWA-S, CSWA-AM** SOLIDWORKS® 2023 - 2026



David C. Planchard
CSWP, SOLIDWORKS Accredited Educator



Better Textbooks. Lower Prices.
www.SDCpublications.com

Visit the following websites to learn more about this book:



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

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

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

TABLE OF CONTENTS

Introduction	I-1
SOLIDWORKS Design Associate (CSWA) Exam	I-1
SOLIDWORKS Sustainability Design Associate (CSWA-SD) Exam	I-3
SOLIDWORKS Simulation Associate (CSWA-S) Exam	I-3
SOLIDWORKS Associate - Additive Manufacturing (CSWA-AM) Exam	I-4
Goals	I-5
CSWA Audience	I-5
CSWA-SD Audience	I-5
CSWA-S Audience	I-5
CSWA-AM Audience	I-6
Bonus Section - 3DEXPERIENCE Platform Certifications	I-6
SOLIDWORKS Associate - Collaborative Designer Role	I-6
SOLIDWORKS Associate - 3D CREATOR (xDesign)	I-7
About the Author	I-7
Acknowledgements	I-9
Contact the Author	I-9
Note to Instructors	I-9
Trademarks, Disclaimers and Copyrighted Materials	I-10
References	I-11
Table of Contents	I-12
Appendix	I-19
About the Book	I-20
Chapter 1 - Overview of SOLIDWORKS and the User Interface	I-1
Chapter Objective	I-4
What is SOLIDWORKS Design?	I-4
Start a SOLIDWORKS Session	I-5
<i>Tutorial: Start a SOLIDWORKS Session</i>	I-5
Welcome dialog box	I-5
Home Tab	I-6
Recent Tab	I-6
Learn Tab	I-6
Alerts Tab	I-7
SOLIDWORKS User Interface (UI) and CommandManager	I-8
Menu Bar toolbar	I-8
Menu Bar menu (No model open)	I-9
Drop-down menu (Model open)	I-9
Drop-down menu (Open part document)	I-9
Create a New Part Document	I-10
Novice Mode	I-11
Advanced Mode	I-11
Graphic Window (Default)	I-12
View Default Sketch Planes	I-13

Download the SOLIDWORKS folder	1-13
Open the Bracket Part	1-13
Part FeatureManager	1-14
FeatureManager Rollback Bar	1-14
Heads-up View toolbar	1-16
Dynamic Annotation Views	1-16
Zoom to Fit	1-16
Zoom to Area	1-16
Window-Select	1-16
Rotate	1-16
Front View	1-17
Right View	1-17
Top View	1-17
Trimetric view	1-17
SOLIDWORKS Help	1-17
SOLIDWORKS Tutorials	1-18
Close SOLIDWORKS Tutorials	1-18
User Interface Tools	1-18
Right-click	1-19
Consolidated toolbar	1-19
System feedback icons	1-19
Confirmation Corner	1-20
Heads-up View toolbars	1-20
CommandManager (Default Part tab)	1-23
CommandManager (Default Drawing tab)	1-24
CommandManager (Default Assembly tab)	1-25
CommandManager (Float/Fit)	1-26
Collapse the CommandManager	1-26
FeatureManager Design Tree	1-27
FeatureManager design tree tab	1-28
PropertyManager tab	1-28
Configuration Manager tab	1-28
DimXpertManager tab	1-28
DisplayManager tab	1-28
CAM tab	1-28
Hide/Show tab	1-28
Sensors tool	1-28
Tags	1-28
Split	1-28
Fly-out FeatureManager	1-29
Task Pane	1-30
3DEXPERIENCE	1-30
3DEXPERIENCE files on This PC	1-31
Design Library	1-31
File Explorer	1-32
View Palette	1-32

Introduction

Appearances, Scenes, and Decals	1-33
Custom Properties	1-33
SOLIDWORKS Resources	1-33
SOLIDWORKS User Forum	1-33
Dynamic Reference Visualization	1-34
Mouse Movements	1-35
Single-Click	1-35
Double-Click	1-35
Right-Click	1-35
Scroll Wheel	1-35
Save SOLIDWORKS Document as Previous Version	1-36
Translate Feature Names in the FeatureManager Tree	1-37
Share and Send To	1-38
Simplified User Interface	1-39
Summary	1-40
Chapter 2 - CSWA Introduction and Drafting Competencies	2-1
Introduction	2-1
Taking the CSWA Exam: Segment 1 or Segment 2	2-3
Segment 1	2-3
Segment 2	2-3
Drafting Competencies	2-8
Procedure to Create a Named Drawing View	2-9
Tutorial: Drawing Name Procedure 2-1	2-10
Tutorial: Drawing Name Procedure 2-2	2-10
Tutorial: Drawing Name Procedure 2-3	2-10
Tutorial: Drawing Name Procedure 2-4	2-11
Tutorial: Drawing Name Procedure 2-5	2-11
Tutorial: Drawing Name Procedure 2-6	2-12
Tutorial: Drawing Name Procedure 2-7	2-12
Tutorial: Drawing Name Procedure 2-8	2-12
Summary	2-14
Questions/Problems	2-15
Chapter 3: Basic Part and Intermediate Part Creation and Modification	3-1
Objectives	3-1
Read and understand an Engineering Document	3-2
Document Properties	3-4
Build a Basic Part from a Detailed Dimensioned Illustration	3-5
Tutorial: Volume/Center of Mass 3-1	3-5
Tutorial: Volume/Center of Mass 3-2	3-6
Tutorial: Mass-Volume 3-3	3-9
Tutorial: Mass-Volume 3-4	3-10
Tutorial: Simple Cut 3-1	3-13
Tutorial: Mass-Volume 3-5	3-14
Tutorial: Mass-Volume 3-6	3-16
Tutorial: Mass-Volume 3-7	3-18
2D vs. 3D Sketching	3-20

Tutorial: 3DSketch 3-1	3-20
Tutorial: Mass-Volume 3-8	3-22
Tutorial: Mass-Volume 3-9	3-24
Callout Value	3-27
Tolerance Type	3-27
Tutorial: Dimension Text 3-1	3-28
Tutorial: Dimension Text 3-2	3-28
Tutorial: Dimension Text 3-3	3-29
Dimension Text Symbols	3-29
Tutorial: Dimension Text Symbols 3-1	3-30
Tutorial: Dimension Text Symbols 3-2	3-30
Build Additional Basic Parts	3-31
Tutorial: Mass-Volume 3-10	3-31
Tutorial: Mass-Volume 3-11	3-33
Tutorial: Mass-Volume 3-12	3-35
Tutorial: Mass-Volume 3-13	3-36
Tutorial: Mass-Volume 3-14	3-38
Tutorial: Mass-Volume 3-15	3-39
Tutorial: Mass-Volume 3-16	3-41
Tutorial: Basic/Intermediate Part 3-1	3-43
Tutorial: Basic/Intermediate Part 3-2	3-46
Tutorial: Basic/Intermediate Part 3-3	3-49
Tutorial: Basic/Intermediate Part 3-4	3-52
Summary	3-54
Questions/Problems	3-55
Chapter 4: Advanced Part Creation and Modification	4-1
Objectives	4-1
Build an Advanced Part from a Detailed Dimensioned Illustration	4-2
Tutorial: Advanced Part 4-1	4-2
Tutorial: Advanced Part 4-2	4-7
Tutorial: Advanced Part 4-3	4-10
Tutorial: Advanced Part 4-4	4-13
Calculate the Center of Mass Relative to a Created Coordinate System	4-18
Tutorial: Coordinate Location 4-1	4-18
Tutorial: Coordinate Location 4-2	4-20
Tutorial: Advanced Part 4-5	4-21
Tutorial: Advanced Part 4-5A	4-25
Tutorial: Advanced Part 4-5B	4-26
Tutorial: Advanced Part 4-6	4-28
Tutorial: Advanced Part 4-6A	4-34
Tutorial: Advanced Part 4-7	4-35
Summary	4-40
Questions/problems	4-42
Chapter 5: Assembly Creation and Modification	5-1
Objectives	5-1
Bottom-Up	5-1

Introduction

Mates	5-4
Standard Mates	5-4
Build an Assembly for a Detailed Dimensioned illustration	5-4
Tutorial: Assembly Model 5-1	5-5
Tutorial: Assembly Model 5-2	5-12
Tutorial: Assembly Model 5-3	5-17
Mate the First Component with Respect to the Assembly Reference Planes	5-22
Tutorial: Assembly Model 5-4	5-22
Tutorial: Assembly Model 5-5	5-27
Summary	5-30
Questions/Problems	5-31

Chapter 6: CSWA-SD Certification **6-1**

Introduction	6-1
Goals	6-3
Background	6-4
Life Cycle Assessment	6-5
Life Cycle Assessment Key Elements	6-6
Design Categories	6-6
References	6-9
SOLIDWORKS Sustainability Methodology	6-9
Sustainable Design Guide	6-10
Tutorial: Analyze a Simple Part	6-11
Summary	6-18
Sample Exam Questions	6-19

Chapter 7: CSWA-S Certification **7-1**

Chapter Objective	7-1
Finite Element Modeling	7-1
Introduction	7-1
CSWA-S Audience	7-6
Basic CSWA-S Concepts	7-8
Simulation Advisor	7-9
Simulation Help & Tutorials	7-10
Linear Static Analysis	7-11
General Procedure to Perform a Linear Static Analysis	7-13
Sequence of Calculations in General	7-15
Stress Calculations in General	7-15
Overview of the Yield or Inflection Point in a Stress-Strain Curve	7-15
Material Properties in General	7-16
Connections in General	7-17
Restraint Types	7-17
Loads and Restraints in General	7-19
Meshing in General	7-20
Meshing Types	7-21
SOLIDWORKS Simulation meshing Tips	7-24
Running the Study	7-26
Displacement Plot - Output of Linear Static Analysis	7-26

Adaptive Methods for Static Studies	7-27
Sample Exam Questions	7-28
FEA Modeling Section	7-49
Tutorial FEA Model 7-1	7-49
Tutorial FEA Model 7-2	7-56
Tutorial FEA Model 7-3	7-65
Tutorial FEA Model 7-4	7-69
Tutorial FEA Model 7-4 Part 2	7-74
Tutorial FEA Model 7-4 Part 3	7-75
Tutorial FEA Model 7-5	7-76
Tutorial FEA Model 7-5 Part 2	7-81
Tutorial FEA Model 7-5 Part 3	7-83
Tutorial FEA Model 7-6	7-84
Tutorial FEA Model 7-7	7-85
Tutorial FEA Model 7-8	7-86
Definitions	7-87
Additional Resources	7-91
Chapter 8 - Additive Manufacturing - 3D Printing	8-1
Additive vs. Subtractive Manufacturing	8-3
3D Printer Technology	8-4
Stages of 3D Printing	8-4
Fused Filament Fabrication (FFF)	8-5
StereoLithography (SLA)	8-8
Selective Laser Sintering (SLS)	8-10
Select the Correct Filament Material for FFF	8-11
PLA (Polylactic Acid)	8-12
Flex/Soft PLA	8-12
PLA Storage	8-13
PLA Part Accuracy	8-13
ABS (Acrylonitrile-Butadiene-Styrene)	8-13
ABS Storage	8-14
ABS Part Accuracy	8-14
Nylon	8-15
Nylon 618	8-15
Nylon 645	8-15
Nylon Storage	8-16
Nylon Accuracy	8-16
PVA (Polyvinyl Alcohol)	8-16
STereoLithography (*.stl) file	8-17
Save an STL (*.stl) file	8-17
Additive Manufacturing (*.amf) file	8-18
Save an Additive Manufacturing (*.amf) file	8-18
3D Manufacturing Format (*.3mf) file	8-19
Save a 3D Manufacturing Format (*.3mf) file	8-19
What is a Slicer?	8-20
How does a Slicer Work?	8-20

Introduction

Slicer Parameters	8-20
Layer Height	8-20
Shell (Wall) Thickness	8-21
Infill Density/Overlap	8-21
Infill Patterns	8-21
Print Speed	8-22
Support Types	8-22
Touching Buildplate	8-22
Everywhere	8-23
Bed Platform Adhesion	8-23
Raft	8-23
Skirt	8-23
Brim	8-23
Part Orientation	8-24
Example 1	8-24
Example 2	8-25
Optimize Print Direction	8-25
Thin Region	8-25
Area of Overhang	8-25
Amount of needed Support	8-25
Remove Model from the Build Plate	8-27
Non-heated Build Plate	8-27
Heated Build Plate	8-27
Know the Printer's Limitations	8-28
Tolerance for Interlocking Parts	8-28
General Printing Tips	8-28
Reduce Infill/Overlap	8-28
Control Build Area Temperature	8-29
Add Pads	8-30
Safe Zone Rule	8-30
First Layer Not Sticking	8-30
Level Build Platform	8-31
Minimize Internal Support	8-31
Design a Water Tight Mesh	8-31
Clearance	8-31
In General (FFF Printers)	8-32
Summary	8-33
Chapter 9 - SOLIDWORKS - COLLABORATIVE DESIGNER Role	9-1
Chapter Objective	9-1
Introduction	9-1
Explore the Collaborative Designer for SOLIDWORKS - Learning Modular 1	9-4
Explore Cloud Services - Learning Modular 2	9-6
Explore the Collaborative Designer for SOLIDWORKS - Learning Modular 3	9-8
Sample Exam Questions	9-11

Chapter 10 - SOLIDWORKS ASSOCIATE - 3D CREATOR (xDesign)	10-1
Chapter Objective	10-1
Introduction	10-2
Explore the 3D Creator Role: Getting Started - Learning Modular 1	10-5
Explore 3D Creator Role - Learning Modular 2	10-7
Sample Exam Questions	10-29
Appendix	A-1
SOLIDWORKS Keyboard Short Cuts	A-1
Modeling - Best Practices	A-3
Helpful On-line Information	A-5
SOLIDWORKS Document Types	A-6
Answer Key	A-7
Chapter 2	A-7
Chapter 3	A-7
Chapter 4	A-9
Chapter 5	A-10
Chapter 6	A-11
Chapter 7	A-15
Chapter 8	A-37
Chapter 9	A-54
Chapter 10	A-72