

Official Guide to Certified **SOLIDWORKS® Associate Exams:** **CSWA, CSDA, CSWSA-FEA**

SOLIDWORKS® 2015 - 2017

An authorized CSWA preparation exam guide
with additional information on the CSDA and
CSWSA-FEA exams

DAVID C. PLANCHARD
CSWP & SOLIDWORKS Accredited Educator



Visit the following websites to learn more about this book:



amazon.com

Google books

BARNES&NOBLE

TABLE OF CONTENTS

Introduction	I-1
Goals	I-2
CSWA Audience	I-3
CSDA Audience	I-3
CSWSA-FEA Audience	I-3
About the Author	I-3
Acknowledgements	I-5
Contact the Author	I-5
Note to Instructors	I-5
Trademarks, Disclaimers and Copyrighted Materials	I-6
References	I-6
Table of Contents	I-7
What is SOLIDWORKS	I-14
Design Intent	I-16
About the Book	I-19
Windows Terminology in SOLIDWORKS	I-20
 Chapter 1 - Overview of SOLIDWORKS and the User Interface	 1-1
Chapter Overview	1-3
Chapter Objective	1-3
What is SOLIDWORKS?	1-3
Start a SOLIDWORKS Session	1-4
SOLIDWORKS UI and CommandManager	1-4
Menu bar toolbar	1-6
Menu bar menu	1-6
Drop-down menu	1-7
Create a new Part Document	1-7
Novice Mode	1-8
Advanced Mode	1-8
Graphic Interface	1-9
Open a Part	1-10
FeatureManager	1-10
Rollback Bar	1-11
Heads-up View toolbar	1-13
Zoom to Fit	1-13
Zoom to Area	1-13
Zoom in	1-13
Rotate	1-13
Standard Views	1-14
SOLIDWORKS Help	1-14
SOLIDWORKS Tutorials	1-15
SOLIDWORKS Icon Style	1-15
Additional User Interface Tools	1-15

Introduction

Right-click Context toolbar	1-16
Consolidated toolbar	1-16
System feedback icons	1-16
Confirmation Corner	1-17
Heads-up View toolbar	1-17
SOLIDWORKS CommandManager	1-20
Part (default tab)	1-20
Drawing (default tab)	1-21
Assembly (default tab)	1-22
Float/Dock	1-23
Selection Enhancements	1-23
FeatureManager Design Tree	1-24
Fly-out FeatureManager	1-26
Task Pane	1-27
SOLIDWORKS Resources	1-27
Design Library	1-28
File Explorer	1-28
Search	1-29
View Palette	1-29
Appearances, Scenes and Decals	1-30
Custom Properties	1-30
SOLIDWORKS Forum	1-30
User Interface for Scaling High Resolution Screens	1-30
Motion Study tab	1-31
3D Views tab	1-32
Dynamic Reference Visualization	1-32
Mouse Movements	1-33
Summary	1-34

Chapter 2 - CSWA Introduction and Drafting Competencies	2-1
Introduction	2-1
Goals	2-6
Objectives	2-7
Procedure to Create a Named Drawing View	2-8
Tutorial: Drawing Named Procedure 2-1	2-9
Tutorial: Drawing Named Procedure 2-2	2-9
Tutorial: Drawing Named Procedure 2-3	2-9
Tutorial: Drawing Named Procedure 2-4	2-10
Tutorial: Drawing Named Procedure 2-5	2-10
Tutorial: Drawing Named Procedure 2-6	2-11
Tutorial: Drawing Named Procedure 2-7	2-11
Tutorial: Drawing Named Procedure 2-8	2-12
Summary	2-12
Questions/Problems	2-13

Chapter 3: Basic Part and Intermediate Part Creation and Modification	3-1
Objectives	3-1
Engineering Documentation Practices	3-2
Build a Basic Part from a Detailed 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

Introduction

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 Location	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	4-41
 Chapter 5: Assembly Creation and Modification	 5-1
Objectives	5-1
Assembly Modeling	5-2
Top-Down	5-2
Bottom-Up	5-2
Build an Assembly from a Detailed Dimensioned illustration	5-3
Tutorial: Assembly Model 5-1	5-5
Tutorial: Assembly Model 5-2	5-11
Tutorial: Assembly Model 5-3	5-16
Mate the First Component with Respect to the Assembly Reference Planes	5-21
Tutorial: Assembly Model 5-4	5-21
Tutorial: Assembly Model 5-5	5-25
Summary	5-28
Questions/Problems	5-29
 Chapter 6: Certified SOLIDWORKS Sustainable Design Associate (CSDA)	 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
Activity: Run Sustainability Analyze a Simple Part	6-11
Summary	6-18
Sample Exam Questions	6-19

Chapter 7: Certified SOLIDWORKS Simulation Associate – Finite Element

Analysis (CSWSA-FEA) Exam	7-1
Introduction	7-1
CSWSA-FEA Exam Audience	7-3
Basic FEA Concepts	7-4
Simulation Advisor	7-5
SOLIDWORKS Simulation Help & Tutorials	7-7
Linear Static Analysis	7-8
General Procedure to Perform a Linear Static Analysis	7-10
Sequence of Calculations in General	7-12
Stress Calculations in General	7-12
Overview of the Yield or Inflection Point in a Stress-Strain Curve	7-12
Material Properties in General	7-13
Connections in General	7-14
Restraint Types	7-14
Loads and Restraints in General	7-16
Meshing in General	7-17
Meshing Types	7-18
SOLIDWORKS Simulation Meshing Tips	7-21
Running the Study	7-23
Displacement Plot - Output of Linear Static Analysis	7-23
Adaptive Methods for Static Studies	7-24
Sample Exam Questions	7-25
FEA Modeling Section	7-39
Tutorial FEA Model 7-1	7-39
Tutorial FEA Model 7-2	7-43
Tutorial FEA Model 7-3	7-47
Tutorial FEA Model 7-4	7-51
Tutorial FEA Model 7-5 Part 1	7-54
Tutorial FEA Model 7-5 Part 2	7-57
Tutorial FEA Model 7-5 Part 3	7-57
Tutorial FEA Model 7-6 Part 1	7-58
Tutorial FEA Model 7-6 Part 2	7-61
Tutorial FEA Model 7-6 Part 3	7-61
Definitions	7-62

Appendix	A-1
SOLIDWORKS Keyboard Shortcuts	A-1
Windows Shortcuts	A-2
Helpful Online Information	A-3

Introduction

Answer Key	A-4
Chapter 2	A-4
Chapter 3	A-4
Chapter 4	A-6
Chapter 5	A-7
Chapter 6	A-8
Chapter 7	A-12
SOLIDWORKS Document Types	A-26

Index	I-1
-------	-----

About the Book

You will find a wealth of information in this book. The book is written for new and intermediate users. The following conventions are used throughout this book:

- The term document refers to a SOLIDWORKS part, drawing or assembly file.
- The list of items across the top of the SOLIDWORKS interface is the Menu bar menu or the Menu bar toolbar. Each item in the Menu bar has a pull-down menu. When you need to select a series of commands from these menus, the following format is used: Click **Insert**, **Reference Geometry**, **Plane** from the Menu bar. The Plane PropertyManager is displayed.
- The book is organized into chapters. Each chapter is focused on a specific certification category. Use the model files in the book for the chapter exercises.
- Copy the corresponding model folders that match your release of SOLIDWORKS to your hard drive. Work directly from your hard drive on the tutorials in the book. SOLIDWORKS model files for 2015 - 2017 are provided.
- The ANSI overall drafting standard and Third Angle projection is used as the default setting in this text. IPS (inch, pound, second) and MMGS (millimeter, gram, second) unit systems are used.

