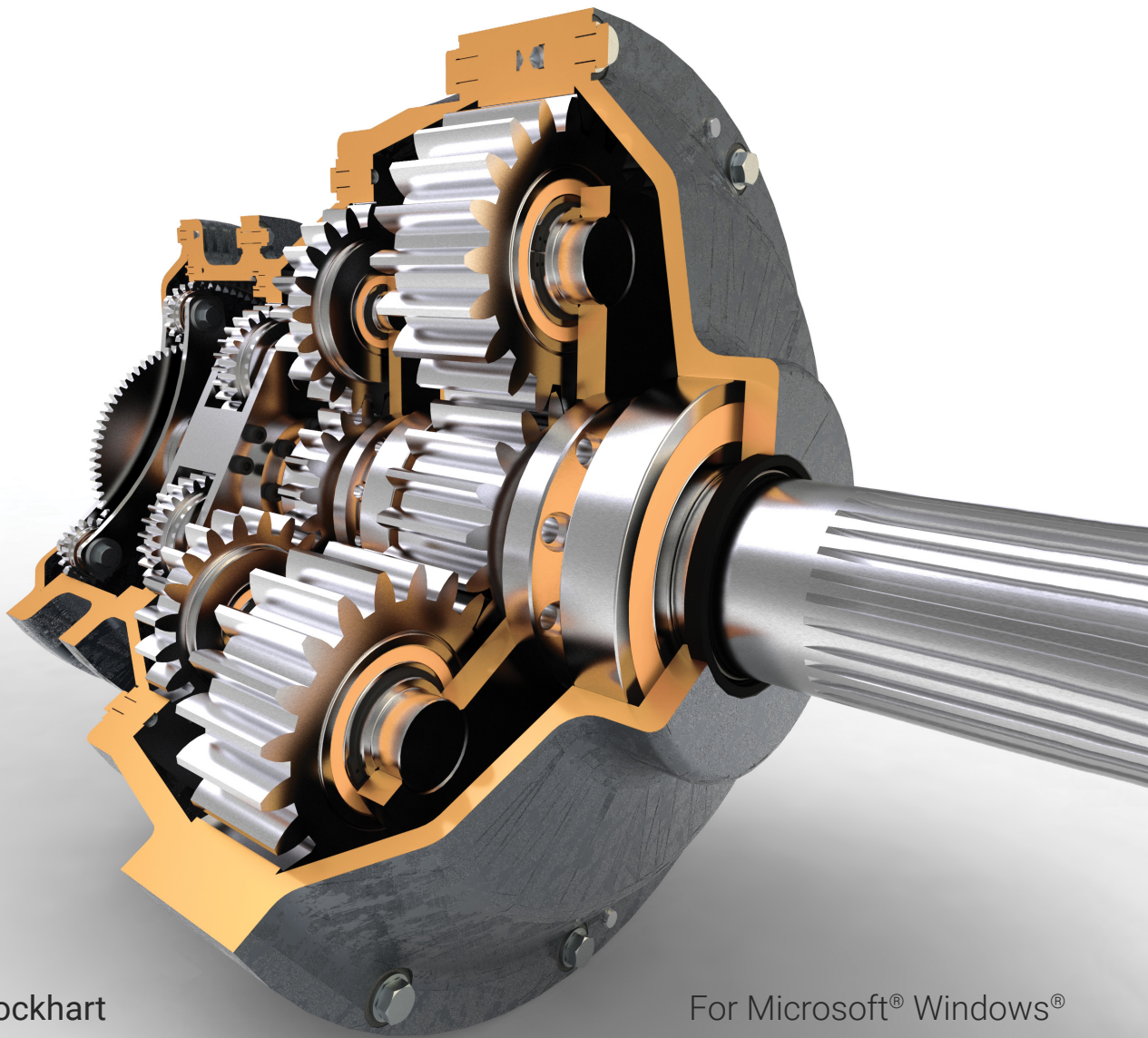


Tutorial Guide to AutoCAD® 2025

2D Drawing, 3D Modeling

Videos
Includes Video Tutorials



Shawna Lockhart

For Microsoft® Windows®



Better Textbooks. Lower Prices.
www.SDCpublications.com



ACCESS CODE
UNIQUE CODE INSIDE

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

GS-1 Preparing for the Tutorials **GS1-1**

Introduction to the Tutorials	GS1-1
Basic Mouse Techniques	GS1-1
Objectives	GS1-1
Recognizing Typographical Conventions	GS1-2
Creating a Work Folder	GS1-4
Installing Data Files for the Tutorials	GS1-5
Configuring AutoCAD for the Tutorials	GS1-5
User Profiles	GS1-8
Backing Up AutoCAD Defaults	GS1-11
Customizable Support Files	GS1-12

GS-2 AutoCAD® Basics **GS2-1**

Introduction	GS2-1
Starting the AutoCAD 2025 Software	GS2-1
Objectives	GS2-1
Microsoft Windows Conventions	GS2-2
Navigating in Windows	GS2-2
Basic Elements of the AutoCAD Graphics Window	GS2-2
Minimizing and Restoring an Application	GS2-3
Microsoft Windows Multitasking Options	GS2-3
Clicking Commands and Menu Options	GS2-4
Entering Points	GS2-4
Dragging	GS2-4
Object Selection	GS2-4
AutoCAD Commands and Options	GS2-5
Typing Commands	GS2-5
Switching the Workspace	GS2-6
Using the Ribbon	GS2-7
Backing Up and Backing Out of Commands	GS2-10
Repeating Commands	GS2-10
Working with the Ribbon	GS2-10
Working with Dialog Boxes	GS2-11
Accessing On-Line Help	GS2-13
Working with Documents	GS2-14
Exiting an AutoCAD Session	GS2-15

GS-3 Studying for the AutoCAD® Certification Exam **G3-1**

General Study Tips	G3-1
Objectives	G3-1
Certification Exam	G3-2
In this book	G3-2
Certified Associate Exam Categories	G3-2

1 Introduction to AutoCAD® **1**

Introduction	1
Starting	1
The AutoCAD Screen	1
Objectives	1
The Quick Access Toolbar	5
The Ribbon	6
Showing a Ribbon Panel	8
Canceling Commands	9
Typing Commands	9
Dynamic Entry	10
Starting a New Drawing	12
Naming Drawing Files	13
Working with Multiple Drawings	14
Using Grid	17
Using Zoom	17
Using Snap Mode	18
Drafting Settings	19
Using Line	20
Entering Coordinates	20
Using Absolute Coordinates	20
Drawing Using Grid and Snap	21
Using Last Point	22
Using Relative X- and Y-Coordinates	22
Using Polar Coordinates	23
Using Help	25
Using Save	27
Using Erase	28
Erasing with Window or Crossing	28
Using Undo	30
Using Redo	31
Drawing a Plot Plan	32

Setting the Units	32		
Sizing Your Drawing	35		
Using Limits	36		
Using Rectangle	37		
Drawing Circles	38		
Adding Text	39		
Copying Text	41		
In Place Text Editing	42		
Moving and Rotating Text	43		
Setting the Text Style	43		
Setting a Style Current	47		
Using Mtext	47		
Spell Checking Your Drawing	50		
Saving Your Drawing	52		
Transferring Files	52		
Exercises	54		
2 Basic Construction Techniques	57		
Introduction	57		
Starting	57		
Opening an Existing Drawing	57		
Objectives	57		
Saving as a New File	59		
Using Layers	60		
Current Layer	60		
Controlling Layers	60		
Controlling Colors	61		
Layer Visibility	62		
Freezing Layers	63		
Locking Layers	64		
Making Object's Layer Current	64		
Using Layer	65		
Using Object Snap	69		
Using Arc	72		
Using Zoom	77		
Using the Scroll Wheel to Zoom	80		
Zoom Dynamic	81		
Using Pan Realtime	82		
Using Circle Options	82		
Circle Tangent, Tangent, Radius	85		
Using Ellipse	85		
Exercises	89		
3 Basic Editing and Plotting Techniques	93		
Introduction	93		
Starting	93		
Starting from a Template Drawing	93		
Objectives	93		
Using Trim	96		
Using Offset	99		
Changing Object Properties	101		
Using the Properties Panel	102		
The Properties Palette	103		
Using Fillet	104		
Using Chamfer	106		
Using Polyline	107		
Using Spline	110		
Using Blend	111		
Getting Information about Your Drawing	112		
Using List	112		
Locating Points	113		
Measuring Geometry	114		
Area	114		
Using Multilines	115		
The Plot Dialog Box	119		
Exercises	126		
4 Geometric Constructions	133		
Introduction	133		
Starting	133		
Setting the Units and Limits	133		
Objectives	133		
Drawing the Wrench	134		
Using Copy Object	134		
Effective Use of Layers	136		
Changing Properties	138		
Setting the Global Linetype Scaling Factor	139		
Changing an Object's Linetype Scale	140		
Using Polygon	143		
Using Polar Tracking	145		
Using Object Snaps	148		
Showing a Floating Toolbar	148		
Object Snap Overrides	149		
More Object Snaps	154		
Object Tracking	156		

Using Break	156	Creating Default Layers	230
Using Extend	158	Using the Drafting Settings Dialog Box	238
Using Rotate	160	Selecting the Default Text Font	239
Using Move	160	Setting the Viewres Default	240
Methods of Selecting Objects	161	Switching to a Paper Space Layout	240
Select Similar	163	Adding a Title Block and Text to Paper Space	241
Using Selection Filters	164	Hide/Show Lineweight on Status Bar	242
Using Quick Select	165	Using Divide	243
Creating the Geneva Cam	166	Setting Point Style	243
Using Construction Line (Xline)	168	Adding the Titles	244
Using Mirror	170	Beginning a New Drawing from a Template Drawing	246
Using Array	172	Changing the Title Block Text	247
Editing Associative Arrays	173	Exercises	248
Making Changes using Grips	174		
Noun/Verb Selection	177		
Using the Path Array	178		
Editing an Associative Path Array	180		
Using the Count Command	182		
Using 2D Parametric Constraints	184		
Exercises	195		
5 Template Drawings and More Plotting	201	6 2D Orthographic Drawings	253
Introduction	201	Introduction	253
Starting	201	The Front, Top, and Right-Side Orthographic Views	253
Using a Standard Template	201	Objectives	253
Objectives	201	View Location	254
Paper Space Layouts	203	Starting	254
Printer Area	204	Switching to Model Space	256
Viewport	204	Deciding the Model Space Limits	256
Switching to Model Space	206	Viewing the Model Space Limits	256
Inserting an Existing Drawing	206	Using Ortho	257
Showing the Drawing in the Layout	209	Drawing Construction Lines	257
Setting the Viewport Zoom Scale	210	Hidden Lines	260
Using Pan to Position the Drawing	213	Drawing Hidden Lines	261
Locking the Viewport Scale	214	Line Precedence	264
Creating a Second Floating Viewport	214	Slanted Surfaces	264
Making a Viewport Active	216	Top-View to Side-View Projection	266
Attributes and Fields	217	Drawing the Miter Line	266
Using Irregularly Shaped Viewports	220	Using Object Snap Tracking	266
Plotting from Paper Space	221	Sizing and Positioning the Drawing	270
Sheet Sets	222	Locking the Viewport Scale	270
Creating a Template Drawing	229	Showing Holes	271
		Drawing Centerlines and Centermarks	272
		Adding the Centerline	274
		Setting the Global Linetype Scaling Factor	276
		Projecting Slanted Surfaces on Cylinders	277
		Exercises	281

7	Dimensioning	287		
	Introduction	287		
	Terminology and Conventions	287		
	Objectives	287		
	Semiautomatic Dimensioning	288		
	Starting	289		
	Dimensioning a Shape	289		
	Setting the Dimension Layer	290		
	Dimension Standards	290		
	Associating Dimensions	291		
	Annotation Scaling	291		
	The Dimension Panel	292		
	Using Dimension Styles	292		
	Creating a Named Dimension Style	293		
	Scaling Dimension Features	294		
	Lines tab	295		
	Symbols and Arrows tab	296		
	Text tab	298		
	Fit Tab	299		
	Setting the Current Style	305		
	Checking Your Dimension Settings	306		
	Associative Dimensioning	307		
	Adding Dimensions to the Layout or the Model	307		
	Adding Dimensions	308		
	Creating a Diameter Dimension	309		
	Baseline Dimensioning	311		
	Using Xplode	314		
	Adding Text with Special Characters	314		
	Using Quick Dimension	316		
	Saving As a Template	316		
	Dimensioning the Adapter	317		
	Using the Continue Option	318		
	Angular Dimensions	318		
	Centering the Views	320		
	Adding the Tolerance Note	320		
	Updating Associative Dimensions	321		
	Using Stretch	321		
	Modifying Dimensions	322		
	Updating a Dimension Style	323		
	Changing the Drawing Scale	324		
	The Annotation Property	327		
	Synch the Annotative and Viewport Scales	328		
	Creating an Annotative Text Style	328		
	Exercises	331		
8	Advanced Dimensioning	335		
	Tolerance	335		
	Objectives	335		
	Tolerance Formats	336		
	Starting	337		
	Automatic Bilateral Tolerances	337		
	Using Limit Tolerances	344		
	Creating Feature Control Frames	346		
	Using Leader with Tolerances	350		
	Creating Datum Flags	352		
	Creating an Annotative Dimension Style	354		
	Exercises	356		
9	Section and Auxiliary Views	359		
	Introduction	359		
	Section Views	359		
	Objectives	359		
	Starting	361		
	Creating 2D Section Views	361		
	Cutting Plane Lines	362		
	Changing Hidden Lines to Visible	367		
	Using Hatch	367		
	Adding the Hatch Pattern	373		
	Creating the Side Section View	374		
	Solid Fill	378		
	Using Draworder	380		
	Changing Associative Hatches	381		
	Auxiliary Views	383		
	Drawing Auxiliary Views Using 2D	383		
	Aligning the UCS with the Angled Surface	385		
	Adding Visual Reference Lines	389		
	Linetype Conventions	389		
	Curved Surfaces	390		
	Drawing the Ellipse	394		
	Exercises	396		

10 Blocks, DesignCenter, and Tool Palettes 401

Introduction	401
Objectives	401
Starting	402
Using the Block Command	402
Inserting a Block	405
Using Explode	407
Using Write Block	407
Using DesignCenter and Tool Palettes	409
Drawing the Half-Adder Circuit	414
Using Donut	415
Freezing the TEXT2 Layer	416
Creating Object Groups	416
Creating Custom Interfaces	419
Creating a Toolbar	422
Using Special Characters in Programmed Commands	424
Exercises	429

11 Introduction to Solid and Surface Modeling 435

Introduction	435
Objectives	435
Starting	436
The 3D Modeling Workspace	436
3D Coordinate Systems	437
Creating 3D Objects	437
Setting the Viewpoint	438
User Coordinate Systems	442
The UCS Icon	443
Dynamic UCS System Variable	444
Using Layers	444
Creating Multiple Viewports	445
Viewports Using Different UCSs	448
Creating Cylinders	450
Selection Cycling	450
Setting Isolines	453
Building Complex Solid Models	454
Using the Viewport Controls	455
Creating Wedges	456
Creating Cones	457
Creating User Coordinate Systems	458
Plotting Solid Models from Paper Space	461

Saving Your Multiview Setup as a Template	463
Creating Solid Models with Extrude and Revolve	464
Region Modeling	466
Extruding a Shape	467
Creating Solids by Revolution	469
Aligning the Views	469
Using the Boolean Operator Intersection	471
Dynamic UCS	474
Creating Surface Models	476
Using Loft	478
Creating a Patch (SURFPATCH)	478
Creating Mesh Models	480
Creating an Edge Mesh	481
Using the Steering Wheel	481
Creating a Network Surface	483
Creating 3D Mesh Primitives	484
Exercises	486

12 Changing and Plotting Solid Models 491

Introduction	491
Starting	491
Objectives	491
Using Fillet on Solids	492
Using Chamfer on Solids	492
Using Slice	493
Creating the Hole	500
Placing Views to Create a Drawing	502
Adding the Centerlines	506
Exercises	508

13 Creating Assembly Drawings from Solid Models 513

Introduction	513
Attaching Solid Models	513
Objectives	513
Starting	514
Using External References	515
Layers and External References	518
Inserting the Solid Part Drawings	519
Checking for Interference	523
Determining Mass Properties (MASSPROP)	525
Creating an Exploded Isometric View	526

Creating a Dynamic Block for the Ball Tags	528		
Defining Attributes	531		
Defining the Parameters	535		
Defining the Actions	536		
Inserting the Ball Tags	537		
Changing an Attribute Value	540		
Changing an Externally Referenced Drawing	540		
Creating the Parts List	542		
Extracting Attribute Information	542		
Exercises	548		
<hr/>			
14 Solid Modeling for Section & Auxiliary Views	555		
Introduction	555		
Creating Sections from a Solid Model	555		
Objectives	555		
Adding a Section View	557		
Using Section Plane	560		
Using Live Section	561		
Section Settings	562		
Creating an Auxiliary View from a 3D Model	563		
Orienting the View	564		
3 Point UCS	564		
Using Plan	565		
Using 3D Dynamic View	566		
Exercises	569		
<hr/>			
		15 Rendering	573
		Introduction	573
		Starting	573
		Objectives	573
		The Render Panel	574
		Adding Lights	581
		Choosing Materials	585
		Creating a New Material	587
		Adjusting Mapping	590
		Adding Backgrounds	591
		Rendering to a File	592
		Using Sun Properties	593
		Geographic Location	594
		Exporting AutoCAD Files	600
		Exercises	602
		Glossary	609
<hr/>			
		Glossary	609
<hr/>			
		AutoCAD[®] Command Summary	623
<hr/>			
		Index	651