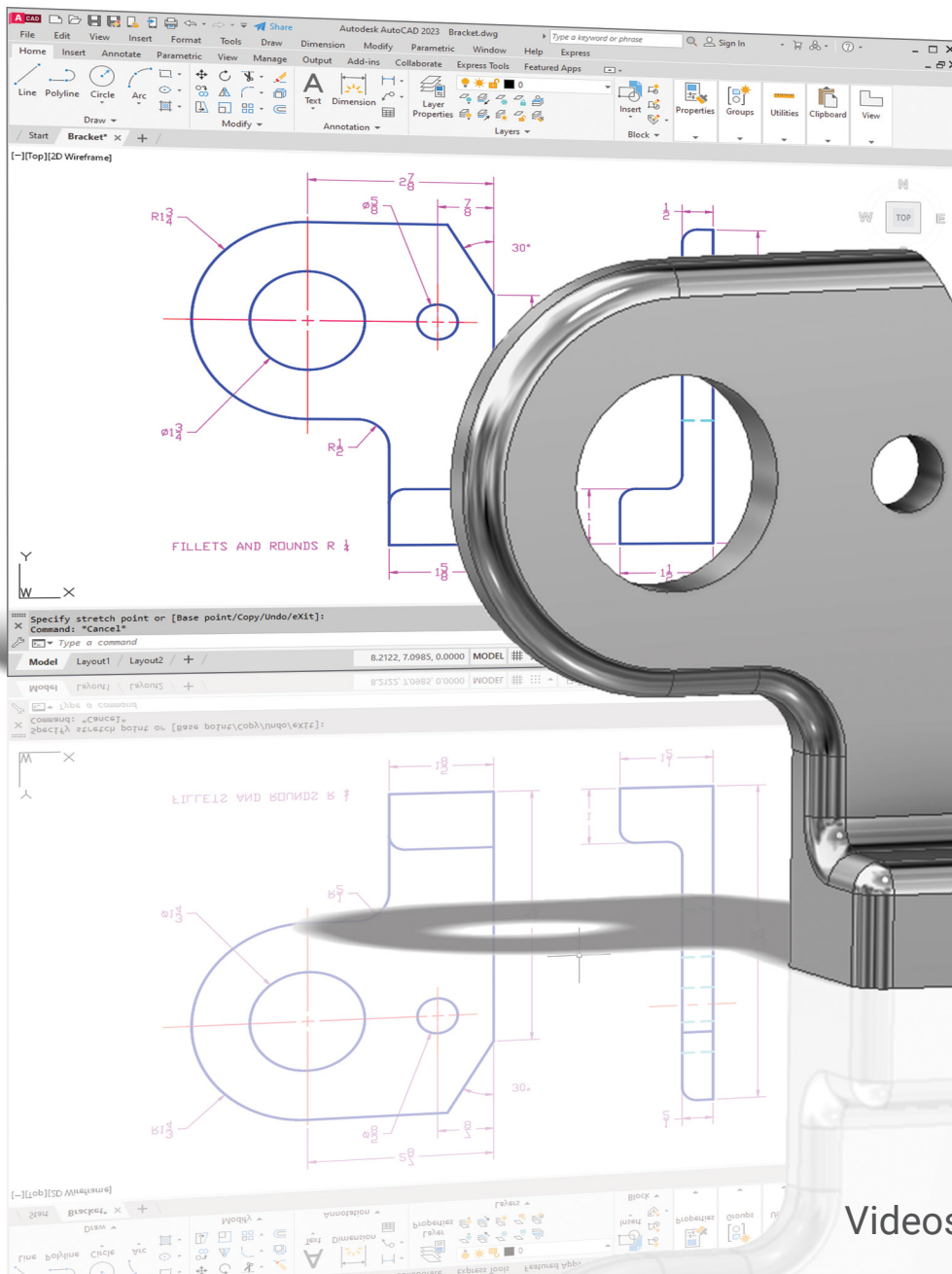


# AutoCAD® 2023

# Tutorial First Level

## 2D Fundamentals

**Videos**  
Includes Extensive  
Video Training



Randy H. Shih  
Videos by Luke Jumper

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

<b>Preface</b>	i
<b>Acknowledgments</b>	ii
<b>Notes on using this book to prepare for the AutoCAD Certified User Examination</b>	iii
<b>AutoCAD Certified User Examination Reference Guide</b>	iv
<b>Tips on Taking the AutoCAD Certified User Examination</b>	x
<b>Introduction</b>	
<b>Getting Started</b>	
Introduction	Intro-2
Development of Computer Geometric Design	Intro-2
Why use AutoCAD 2023?	Intro-5
Getting Started with AutoCAD 2023	Intro-7
AutoCAD 2023 Screen Layout	Intro-8
Application Menu	Intro-9
Quick Access Toolbar	Intro-9
AutoCAD Menu Bar	Intro-9
Layout Tabs	Intro-9
Drawing Area	Intro-10
Graphics Cursor or Crosshairs	Intro-10
Command Prompt Area	Intro-10
Cursor Coordinates	Intro-10
Status Toolbar	Intro-10
Ribbon Tabs and Panels	Intro-11
Draw and Modify Toolbar Panel	Intro-11
Layers Control Toolbar Panel	Intro-11
Viewport/View/Display Controls	Intro-11
Mouse Buttons	Intro-12
[Esc] - Canceling Commands	Intro-12
Online Help	Intro-13
Leaving AutoCAD 2023	Intro-14
Creating a CAD File Folder	Intro-14
<b>Chapter 1</b>	
<b>AutoCAD Fundamentals</b>	
AutoCAD Certified User Examination Objectives Coverage	1-2
Introduction	1-3
Starting Up AutoCAD 2023	1-3
Drawing Units Setup	1-5
Drawing Area Setup	1-6
Drawing Lines with the Line Command	1-8

Visual Reference	1-10
GRID ON	1-11
SNAP Mode ON	1-12
Using the Erase Command	1-13
Repeat the Last Command	1-14
The CAD Database and the User Coordinate System	1-15
Changing to the 2D UCS Icon Display	1-16
Cartesian and Polar Coordinate Systems	1-17
Absolute and Relative Coordinates	1-17
Defining Positions	1-18
Grid Style Setup	1-18
The Guide Plate	1-19
Creating Circles	1-23
Saving the CAD Design	1-25
Close the Current Drawing	1-26
The Spacer Design	1-27
Start a New Drawing	1-27
Drawing Units Setup	1-28
Drawing Area Setup	1-29
Use the Line Command	1-31
Use the Erase Command	1-33
Using the Arc Command	1-33
Using the Circle Command	1-35
Saving the CAD Design	1-36
Exit AutoCAD	1-36
Review Questions	1-37
Exercises	1-38

## **Chapter 2**

### **Basic Object Construction Tools**

AutoCAD Certified User Examination Objectives Coverage	2-2
Introduction	2-3
Starting Up AutoCAD 2023	2-3
Dynamic Input	2-4
The RockerArm Design	2-7
Activate the Startup Option	2-8
Drawing Units Display Setup	2-9
GRID and SNAP Intervals Setup	2-10
Drawing Area Setup	2-11
Referencing the World Coordinate System	2-12
Creating Circles	2-13
Object Snap Toolbar	2-14
Using the Line command	2-15
Creating a TTR Circle	2-17
Using the Trim Command	2-19

Using the Polygon Command	2-21
Creating a Concentric Circle	2-23
Using the QuickCalc Calculator to Measure Distance and Angle	2-24
Saving the CAD file	2-28
Exit AutoCAD	2-28
AutoCAD Quick Keys	2-29
Review Questions	2-30
Exercises	2-31

### **Chapter 3**

## **Geometric Construction and Editing Tools**

AutoCAD Certified User Examination Objectives Coverage	3-2
Geometric Constructions	3-4
Starting Up AutoCAD 2023	3-5
Geometric Construction - CAD Method	3-6
Bisection of a Line or Arc	3-6
Bisection of an Angle	3-9
Transfer of an Angle	3-11
Dividing a Given Line into a Number of Equal Parts	3-14
Circle through Three Points	3-16
Line Tangent to a Circle from a Given Point	3-17
Circle of a Given Radius Tangent to Two Given Lines	3-18
The Gasket Design	3-21
Drawing Units Display Setup	3-22
GRID and SNAP Intervals Setup	3-23
Using the LINE Command with ORTHO Option	3-24
Object Snap Toolbar	3-26
Using the Extend Command	3-29
Using the Trim Command	3-30
Creating a TTR Circle	3-31
Using the Fillet Command	3-32
Converting Objects into a Polyline	3-33
Using the Offset Command	3-34
Using the Area Inquiry Tool to Measure Area and Perimeter	3-35
Using the Explode Command	3-37
Create another Fillet	3-37
Saving the CAD file	3-38
Exit AutoCAD	3-38
Review Questions	3-39
Exercises	3-40

## **Chapter 4**

### **Object Properties and Organization**

AutoCAD Certified User Examination Objectives Coverage	4-2
Introduction	4-3
The Floor Plan Design	4-3
Starting Up AutoCAD 2023	4-4
Using the Setup Wizard	4-4
Drawing Units Setup	4-5
Reference Area Setup	4-5
GRID and SNAP Intervals Setup	4-6
Using the Zoom Extents Command in the Navigation Bar	4-7
The AutoCAD Multiline Command	4-7
Object Snap Toolbar	4-10
Drawing Multilines	4-11
Creating Interior Walls	4-14
Joining the Walls using Multiline Edit	4-17
Using Layers and Object Properties	4-19
Using Zoom Realtime	4-22
Modeling the Bathroom	4-23
Controlling Layer Visibility	4-25
Adding a New Layer	4-25
Moving Objects to a Different Layer	4-26
Matching Layer Properties	4-27
Review Questions	4-29
Exercises	4-30

## **Chapter 5**

### **Orthographic Views in Multiview Drawings**

AutoCAD Certified User Examination Objectives Coverage	5-2
Introduction	5-3
The Locator Design	5-3
The Locator Part	5-4
Starting Up AutoCAD 2023	5-4
Layers Setup	5-5
Drawing Construction Lines	5-6
Using the Offset Command	5-6
Set Layer Object as the Current Layer	5-8
Using the Running Object Snaps	5-8
Creating Object Lines	5-10
Turn Off the Construction Lines Layer	5-11
Adding More Objects in the Front View	5-11
AutoCAD's AutoSnap™ and AutoTrack™ Features	5-12
Adding More Objects in the Top View	5-14
Drawing Using the Miter Line Method	5-18
More Layers Setup	5-20

---

Top View to Side View Projection	5-21
Completing the Front View	5-23
Object Information Using the List Command	5-25
Object Information Using the Properties Command	5-26
Review Questions	5-27
Exercises	5-28

## **Chapter 6**

### **AutoCAD 2D Isometric Drawings**

Introduction	6-2
The Angle Support Design	6-3
Starting Up AutoCAD 2023	6-4
AutoCAD ISOPLANE and ISODRAFT Commands	6-5
Layers Setup	6-6
Create the Base Box of the Design	6-7
Create the Design inside the Base Box	6-11
Create the Isocircle on the top face	6-14
Using the Editing Tools in an Isometric drawing	6-17
The Tube Anchor Design – Modeling Strategy	6-17
Start a New Drawing and Layers Setup	6-18
Create a Base Box of the Design	6-19
Locate the Centers for the Isocircles	6-22
Create the Isocircles	6-24
Using the Parametric tools to complete the drawing	6-31
Review Questions	6-36
Exercises	6-37

## **Chapter 7**

### **Basic Dimensioning and Notes**

AutoCAD Certified User Examination Objectives Coverage	7-2
Introduction	7-3
The Bracket Design	7-3
Starting Up AutoCAD 2023	7-4
Layers Setup	7-5
The Bracket Design	7-6
LineWeight Display Control	7-6
Drawing Construction Lines	7-7
Using the Offset Command	7-7
Set Layer Object_Lines as the Current Layer	7-9
Creating Object Lines	7-9
Creating Hidden Lines	7-10
Creating Center Lines	7-11
Turn Off the Construction Lines	7-11

Using the Fillet Command	7-12
Saving the Completed CAD Design	7-13
Accessing the Dimensioning Commands	7-14
The Dimension Toolbar	7-15
Using Dimension Style Manager	7-15
Dimensions Nomenclature and Basics	7-16
Using the Center Mark Command	7-19
Adding Linear Dimensions	7-20
Adding an Angular Dimension	7-21
Adding Radius and Diameter Dimensions	7-22
Using the Multiline Text Command	7-23
Adding Special Characters	7-24
Saving the Design	7-25
A Special Note on Layers Containing Dimensions	7-25
Review Questions	7-26
Exercises	7-27

## **Chapter 8**

### **Templates and Plotting**

AutoCAD Certified User Examination Objectives Coverage	8-2
Introduction	8-3
The Geneva Cam Design	8-3
Starting Up AutoCAD 2023	8-4
Setting up the Plot Style Mode	8-5
Starting a New File	8-7
Grid and Snap Intervals Setup	8-8
Layers Setup	8-9
Adding Borders and Title Block in the Layout	8-10
Create a Template File	8-13
Exit AutoCAD 2023	8-14
Starting Up AutoCAD 2023	8-14
The Geneva Cam Drawing	8-15
Drawing Construction Lines	8-16
Creating Object Lines	8-17
Using the Offset Command	8-18
Using the Mirror Command	8-20
Using the Array Command	8-21
Creating a Viewport Inside the Title Block	8-24
Viewport Properties	8-25
Hide the Viewport Borders	8-26
Adjusting the Dimension Scale	8-26
Plot/Print the Drawing – Color or Grey Scale Prints	8-28
Create a B size Layout of the design	8-30
Adjust the Dimension Scale for the B size Print	8-34
Additional Title Blocks	8-36



Review Questions	8-38
Exercises	8-39

## **Chapter 9**

### **Parametric Drawing Tools**

AutoCAD Certified User Examination Objectives Coverage	9-2
Introduction	9-3
Starting Up AutoCAD 2023	9-5
Layers Setup	9-5
Creating Rough Sketches	9-6
Parametric Drawing Tools	9-8
Applying Geometric Constraints	9-9
Applying Dimensional Constraints	9-12
Additional Geometric and Dimensional Constructions	9-14
Using the Mirror Command	9-25
Using the Trim Command	9-26
Using the Auto Constrain Command	9-28
Creating and Constraining Additional Circles	9-30
Control the Display of Constraints	9-33
The Implicit Geometric Constraint Approach	9-34
Review Questions	9-40
Exercises	9-41

## **Chapter 10**

### **Auxiliary Views and Editing with GRIPS**

AutoCAD Certified User Examination Objectives Coverage	10-2
Introduction	10-3
The V-Block Design	10-3
The V-Block Example	10-4
Starting Up AutoCAD 2023	10-4
Setting up the Principal Views	10-5
Setting up the Top View	10-8
Using the Offset Command	10-9
Creating Object Lines in the Front View	10-11
Setting the Polar Tracking Option	10-12
Setting up the Auxiliary View	10-15
Aligning the Auxiliary View to the Front View	10-16
Creating the V-cut in the Auxiliary View	10-16
Creating the V-cut in the Front View and Top View	10-19
Setting the Polar Tracking Option	10-21
Completing the Top View	10-21
Edit the Plot Style Table – Black and White Prints	10-24
Start a new drawing for a Metric Template File	10-27
Layers Setup	10-28

Set up the Metric Borders and Title Block by Copy & Paste	10-29
Review Questions	10-34
Exercises	10-35

## **Chapter 11**

### **Section Views**

AutoCAD Certified User Examination Objectives Coverage	11-2
Introduction	11-3
The Bearing Design	11-3
Starting Up AutoCAD 2023	11-4
The Bearing Design	11-5
Setting up the Principal Views	11-5
Creating Object Lines in the Front View	11-7
Editing the Circles	11-9
Setting up the Side View	11-10
Adding Hidden Lines in the Side View	11-12
Changing the Linetype Scale Property	11-14
Stretching and Moving Objects with Grips	11-15
Drawing a Cutting Plane Line	11-16
Converting the Side View into a Section View	11-19
Adding Section Lines	11-21
Review Questions	11-24
Exercises	11-25

## **Chapter 12**

### **Assembly Drawings and Blocks**

AutoCAD Certified User Examination Objectives Coverage	12-2
Introduction	12-3
The Shaft Support Subassembly	12-4
Additional Parts	12-4
(1) Cap-Screw	12-4
(2) Collar	12-5
(3) Base-Plate	12-5
Starting Up AutoCAD 2023 and Loading Multiple Drawings	12-6
Using AutoCAD with the Internet	12-7
Rearrange the Displayed Windows	12-8
Defining a Block	12-9
Insert and Rotate a Block	12-11
Starting the Assembly Drawing	12-12
Copying and Pasting with the Windows Clipboard	12-13
Converting the View into a Section View	12-14
Adding the Bearing to the Assembly	12-16
Adding the Cap-Screws to the Assembly	12-19
Creating Callouts with the Multileader Command	12-21

Creating a Viewport in the A-Size Layout	12-24
Viewport Properties	12-25
Adding a Parts List to the Assembly Drawing	12-26
Review Questions	12-32
Exercises	12-33

## **Index**