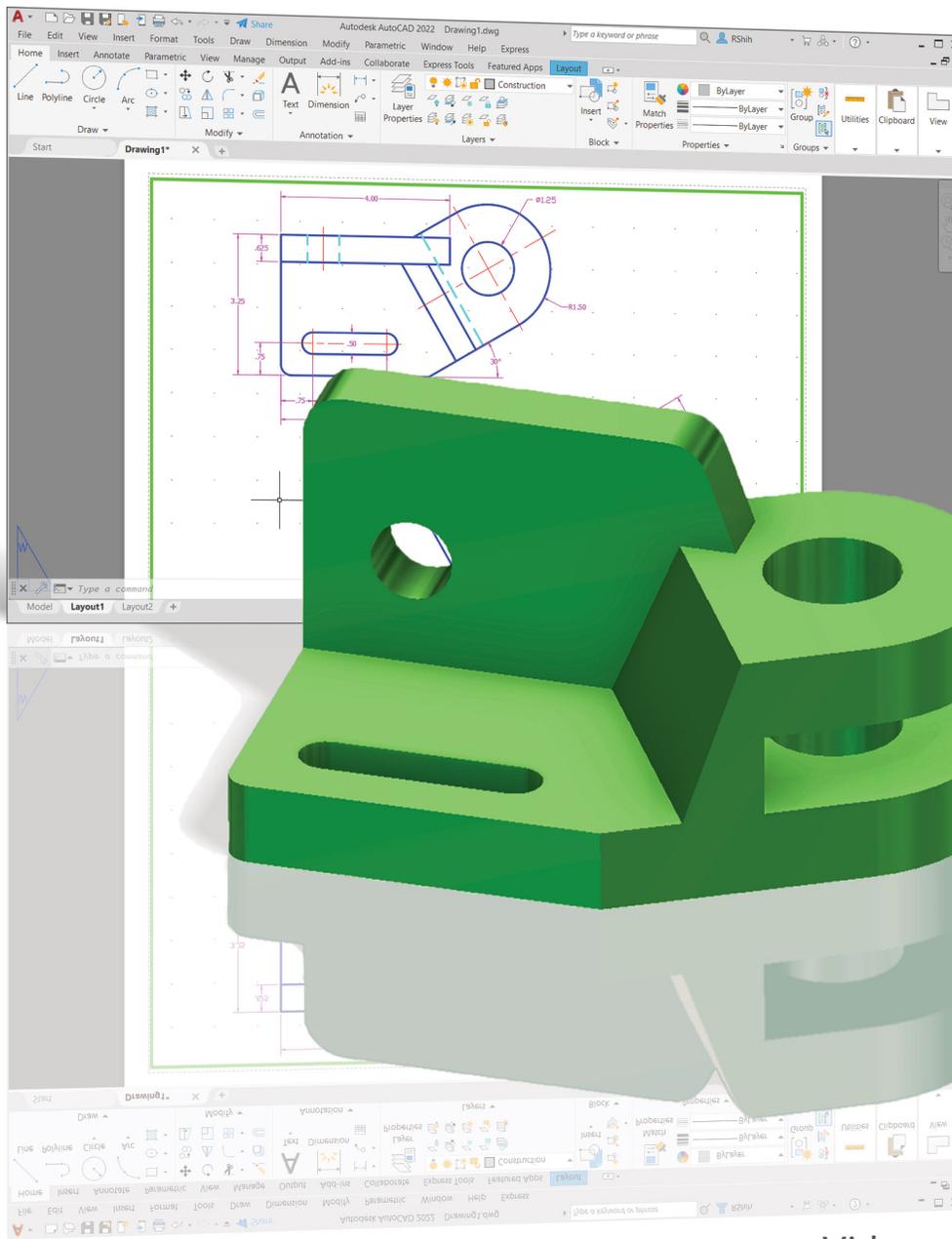


Videos
Includes Extensive
Video Training

AutoCAD® 2022 Tutorial

First Level 2D Fundamentals



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

| | |
|---|----------|
| Preface | i |
| Acknowledgments | ii |
| Notes on using this book to prepare for the AutoCAD Certified User Examination | iii |
| AutoCAD Certified User Examination Reference Guide | iv |
| Tips on Taking the AutoCAD Certified User Examination | x |
| | |
| Introduction | |
| Getting Started | |
| Introduction | Intro-2 |
| Development of Computer Geometric Design | Intro-2 |
| Why use AutoCAD 2022? | Intro-5 |
| Getting Started with AutoCAD 2022 | Intro-7 |
| AutoCAD 2022 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 2022 | Intro-14 |
| Creating a CAD File Folder | Intro-14 |
| | |
| Chapter 1 | |
| AutoCAD Fundamentals | |
| AutoCAD Certified User Examination Objectives Coverage | 1-2 |
| Introduction | 1-3 |
| Starting Up AutoCAD 2022 | 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 2022 | 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 2022 | 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 | 3-15 |
| Circle through Three Points | 3-17 |
| Line Tangent to a Circle from a Given Point | 3-18 |
| Circle of a Given Radius Tangent to Two Given Lines | 3-19 |
| The Gasket Design | 3-22 |
| Drawing Units Display Setup | 3-23 |
| GRID and SNAP Intervals Setup | 3-24 |
| Using the LINE Command with ORTHO Option | 3-25 |
| Object Snap Toolbar | 3-27 |
| Using the Extend Command | 3-30 |
| Using the Trim Command | 3-31 |
| Creating a TTR Circle | 3-32 |
| Using the Fillet Command | 3-33 |
| Converting Objects into a Polyline | 3-34 |
| Using the Offset Command | 3-35 |
| Using the Area Inquiry Tool to Measure Area and Perimeter | 3-36 |
| Using the Explode Command | 3-38 |
| Create another Fillet | 3-38 |
| Saving the CAD file | 3-39 |
| Exit AutoCAD | 3-39 |
| Review Questions | 3-40 |
| Exercises | 3-41 |

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 2022 | 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 2022 | 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 2022 | 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 2022 | 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 2022 | 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 2022 | 8-14 |
| Starting Up AutoCAD 2022 | 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 2022 | 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 2022 | 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 2022 | 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 2022 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