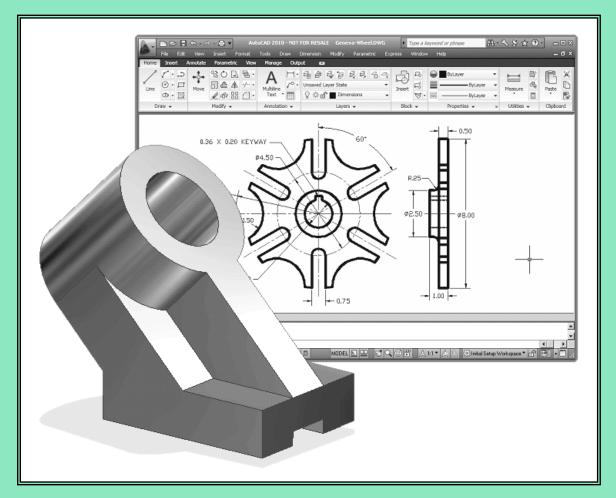
AutoCAD[®] 2010 Tutorial First Level: 2D Fundamentals



by **Randy H. Shih** Oregon Institute of Technology



Table of Contents

Preface	i
Acknowledgments	ii
Notes on using this book to prepare for the AutoCAD	
Certified Associate Examination	iii
AutoCAD Certified Associate Examination Reference Guide	iv
Tips on Taking the AutoCAD Certified Associate Examination	X

Introduction Getting Started

Introduction	Intro-2
Development of Computer Aided Design	Intro-2
Why use AutoCAD [®] 2010	Intro-5
Getting started with AutoCAD [®] 2010	Intro-7
AutoCAD [®] 2010 Screen Layout	Intro-8
Menu Browser	Intro-9
Quick Access Toolbar	Intro-9
Graphics Window	Intro-9
Graphics Cursor or Crosshairs	Intro-9
Command prompt Area	Intro-9
Cursor Coordinates	Intro-10
Status Toolbar	Intro-10
Ribbon Tabs and Panels	Intro-10
Draw and Modify Toolbar Panel	Intro-10
Layers Control Toolbar Panel	Intro-11
Annotation Toolbar Panel	Intro-11
Layout/Model Toolbar	Intro-11
Viewing Toolbar	Intro-11
Workspace switching	Intro-11
Mouse Buttons	Intro-12
[Esc] - Canceling commands	Intro-12
On-Line Help	Intro-13
Leaving AutoCAD [®] 2010	Intro-14
Creating a CAD file folder	Intro-15
Tips about Taking the AutoCAD Certification Examination	Intro-16

Chapter 1 AutoCAD Fundamentals

AutoCAD Certified Associate Examination Objectives Coverage	1-2
Introduction	1-3
Starting Up AutoCAD [®] 2010	1-3

Drawing Units display Setup	1-4
Drawing Area Setup	1-6
Using the InfoCenter to get more information	1-7
Drawing Lines with the LINE command	1-8
Visual reference	1-10
GRID ON	1-11
SNAP ON	1-12
Using the ERASER	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
The Guide Plate	1-18
Creating Circles	1-22
Save the CAD file	1-24
Exit AutoCAD	1-25
Review Questions	1-26
Exercises	1-27

Chapter 2 Basic Object Construction Tools

AutoCAD Certified Associate Examination Objectives Coverage Introduction Starting Up AutoCAD [®] 2010	2-2 2-3 2-4
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 <i>Circles</i>	2-13
Object Snap Toolbar	2-14
Using the LINE command	2-15
Creating a TTR circles	2-17
Using the TRIM Command	2-19
Using the Polygon command	2-21
Creating a Concentric Circle	2-23
Using the QuickCal calculator to Measure Distance and Angle	2-24
Saving the CAD file	2-28
Exit AutoCAD	2-28
Review Questions	2-29
Exercises	2-30

xii

Chapter 3 Geometric Construction and Editing Tools

AutoCAD Certified Associate Examination Objectives Coverage	3-2
Tips on Taking the AutoCAD Certified Associate Examination	3-3
Geometric Constructions	3-4
Starting Up AutoCAD [®] 2010	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 <i>LINE</i> command	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 <i>Polyline</i>	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 Associate Examination Objectives Coverage	4-2
Introduction	4-3
The Floor Plan Design	4-3
Starting Up AutoCAD [®] 2010	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 Extent command	4-7
The AutoCAD MULTILINE command	4-7
Drawing <i>Multilines</i>	4-10
Creating interior walls	4-12
Joining the walls using MULTILINE EDIT	4-16
Using Layers and Object Properties	4-18
Using ZOOM REALTIME	4-21
Modeling the Bathroom	4-22
Controlling Layer Visibility	4-24
Adding a New Layer	4-24
Moving objects to a different layer	4-25
Review Questions	4-27
Exercises	4-28

Chapter 5 Orthographic Views in Multiview Drawings

AutoCAD Certified Associate Examination Objectives Coverage	4-2
Introduction	5-2
The LOCATOR Design	5-2
The Locator part	5-3
Starting Up AutoCAD [®] 2010	5-3
GRID and SNAP intervals Setup	5-4
Layers setup	5-5
Drawing Construction Lines	5-6
Using the OFFSET command	5-6
Set Layer <i>Object</i> as the current layer	5-8
Using the Running Object Snaps	5-8
Creating Object lines	5-10
Turn OFF the construction Lines	5-11
Adding more objects in the Front View	5-11
AutoCAD's AutoSnap TM and AutoTrack TM 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

XV

Chapter 6 Basic Dimensioning and Notes

AutoCAD Certified Associate Examination Objectives Coverage	6-2
Introduction	6-3
The Bracket Design	6-3
Starting Up AutoCAD [®] 2010	6-4
GRID and SNAP intervals Setup	6-5
Layers setup	6-6
The Bracket Design	6-7
Drawing Construction Lines	6-8
Using the <i>OFFSET</i> command	6-8
Set Layer Object Lines as the current layer	6-9
Creating Object lines	6-9
Creating Hidden lines	6-10
Creating Center lines	6-11
Turn OFF the Construction Lines	6-11
Using the FILLET command	6-12
Saving the Completed CAD Design	6-13
Accessing the Dimensioning Commands	6-15
The Dimension toolbar	6-16
Using Dimension Style Manager	6-16
Dimensions Nomenclature and Basics	6-17
Using the Center Mark command	6-20
Adding Linear Dimensions	6-21
Adding Angular Dimensions	6-22
Adding Radius and Diameter Dimensions	6-23
Using the SINGLE LINE TEXT command	6-24
Adding Special Characters	6-25
Saving the design	6-26
A Special Note on Layers containing Dimensions	6-26
Review Questions	6-27
Exercises	6-28

Chapter 7 Templates and Plotting

AutoCAD Certified Associate Examination Objectives Coverage	7-2
Introduction	7-3
The Geneva Cam Design	7-3
Starting Up AutoCAD [®] 2010	7-4
Setting up the Plot Style Mode	7-5
Starting a new file	7-7
GRID and SNAP intervals Setup	7-8
Layers setup	7-9
Adding Borders and Title Block in the Layout	7-10

Create a <i>Template file</i>	7-13
Exit AutoCAD [®] 2010	7-14
Starting Up AutoCAD [®] 2010	7-14
The Geneva Cam Drawing	7-15
Drawing Construction Lines	7-16
Creating Object lines	7-17
Using the OFFSET command	7-18
Using the MIRROR command	7-20
Using the ARRAY command	7-21
Creating a <i>Viewport</i> inside the Title Block	7-23
Viewport properties	7-24
Hide the Viewport borders	7-25
Adjusting the dimension scale	7-25
<i>Plot/Print</i> the drawing	7-27
Review Questions	7-29
Exercises	7-30

Chapter 8 Parametric Drawing Tools

AutoCAD Certified Associate Examination Objectives Coverage	8-2
Introduction	8-3
Starting Up AutoCAD [®] 2010	8-5
Layers setup	8-6
Creating Rough Sketches	8-7
Parametric drawing tools	8-9
Applying Geometric Constraints	8-10
Applying Dimensional Constraints	8-12
Additional Geometric and Dimensional Constructions	8-15
Using the MIRROR command	8-26
Using the TRIM command	8-27
Using the Auto Constrain command	8-29
Creating and Constraining Additional Circles	8-31
Control the Display of Constraints	8-34
Review Questions	8-35
Exercises	8-36

Chapter 9 Auxiliary Views and Editing with GRIPS

AutoCAD Certified Associate Examination Objectives Coverage	9-2
Introduction	9-3
The V-Block Design	9-3
Starting Up AutoCAD [®] 2010	9-4

Using the AutoCAD Classic Workspace	9-5
Setting up the Principal Views	9-6
Setting up the Top View	9-9
Using the OFFSET command	9-10
Creating Object lines in the Front View	9-12
Setting the POLAR TRACKING option	9-13
Setting up the Auxiliary View	9-16
Aligning the Auxiliary View to the Front View	9-17
Creating the V-cut in the Auxiliary View	9-17
Creating the V-cut in the Front-View and Top-View	9-20
Setting the Polar Tracking option	9-22
Completing the <i>Top-View</i>	9-22
Edit the Plot style table	9-26
Review Questions	9-28
Exercises	9-29

Chapter 10 Section Views

AutoCAD Certified Associate Examination Objectives Coverage	10-2
Introduction	10-3
The <i>Bearing</i> Design	10-3
Starting Up AutoCAD [®] 2010	10-4
The <i>Bearing</i> Example	10-5
Setting up the Principal Views	10-5
Creating Object lines in the Front View	10-7
Editing the circles	10-9
Setting up the Side View	10-10
Adding Hidden Lines in the Side view	10-12
Changing the Line Type Scale Property	10-13
Stretching and Moving Objects with GRIPS	10-15
Drawing a cutting plane line	10-16
Converting the Side View into a Section View	10-19
Adding Section Lines	10-21
Review Questions	10-24
Exercises	10-25

Chapter 11 Assembly Drawings and Blocks

AutoCAD Certified Associate Examination Objectives Coverage	11-2
Tips on Taking the AutoCAD Certified Associate Examination	11-3
Introduction	11-4
The Shaft Support Subassembly	11-5
Additional parts	11-5

(1) Cap-Screw	11-5
(2) Collar	11-6
(3) Base-plate	11-6
Starting Up AutoCAD [®] and Loading multiple drawings	11-7
Using AutoCAD with the Internet	11-8
Rearrange the Displayed Windows	11-9
Defining a <i>Block</i>	11-10
Inserting a <i>Block</i>	11-12
Starting the Assembly drawing	11-13
Copying and Pasting with the Windows Clipboard	11-14
Converting the View into a Section View	11-15
Adding the Bearing to the Assembly Drawing	11-17
Adding the Cap-screws to the Assembly Drawing	11-20
Creating Callouts with the Multileader command	11-22
Creating a <i>Viewport</i> in the A-size layout	11-25
Viewport properties	11-26
Adding a PARTS LIST to the assembly drawing	11-27
Review Questions	11-33
Exercise	11-34

Index