



## Course Content

### Course Description:

In this course, you will cover: working with files, drawing command concepts, selecting sets, basic drawing setup, object snap and object snap tracking, drawing commands I, modifying & viewing commands, layering and object properties, advanced drawing setup, layouts and viewports, printing and plotting, draw commands II and modify commands II, inquiry commands, creating & editing text, grip editing, blocks, design center and tool palettes, multiview drawing, pictorial drawings, section & auxiliary views, dimensioning, dimension styles and dimension variables. This class will cover the latest version of AutoCAD.

### Prerequisites

Windows Level 1, understanding of graphics is a plus. Engineering background beneficial.

### Topics:

#### Getting Started with AutoCAD

- Concepts
- Coordinate Systems
- The CAD Database
- Angles in AutoCAD
- Draw True Size
- Plot to Scale

#### Starting AutoCAD

- The AutoCAD Drawing Editor
- Workspaces
- Beginning a Drawing
- Graphics Area
- Command Line
- Palettes
- Toolbars
- Application Menu and Quick Access Toolbar
- Pull-Down Menus
- Dialog Boxes and Palettes
- Shortcut Menus
- Screen (Side) Menu
- Digitizing Tablet Menu
- Command Entry Using the Keyboard
- Accelerator Keys (Control Key Sequences)
- Special Key Functions
- Mouse buttons
- Command Entry

- Methods for Entering Commands
- Using the 'Command Tables'
- Command Entry Methods Practice
- AutoCAD Drawing Aids
- Coordinate Display (Coords)
- Status Bar
- Drawing Aids
- Function Keys
- AutoCAD Text Window
- Model Space and Layouts
- Customizing the AutoCAD Screen
- Toolbars
- Ribbon
- Clean Screen
- Communication Center
- Tray Settings
- Command Line
- Options

#### Working with Files

- AutoCAD Drawing Files
- Naming Drawing Files
- Beginning and Saving an AutoCAD Drawing
- Accessing File Commands
- File navigation dialog box Functions
- Windows Right-Click Shortcut Menus
- AutoCAD File Commands



- AutoCAD Backup Files
- Drawing Recovery
- AutoCAD Drawing File Management
- Using other File Formats

## Draw Command Concepts

### AutoCAD Objects

#### Locating the Draw Commands

#### Coordinate Entry

- Coordinate Formats and Types
- Coordinate Formats
- Coordinate Types
- Typical Combinations
- Three Methods of Coordinate Input
- Mouse Input
- Dynamic Input
- Command Line Input
- Using the Three Coordinate Input Methods
- Line
- Circle
- Using Mouse Input
- Using Dynamic Input
- Using Command Line Input
- Direct Distance entry and Angle Override
- Dynamic Input Settings
- Polar Tracking and Polar Snap
- Polar Tracking
- Polar Tracking with Direct Distance Entry
- Polar Tracking Override
- Polar Snap
- Drawing Lines Using Polar Tracking
- Using Polar Tracking and Grid Snap
- Using Polar Tracking and Dynamic Input
- Using Polar Tracking, Polar Snap, and Dynamic Input

#### Selection Sets

- Modify Command Concepts
- Selection Sets
- Selection Set Options
- Select
- Noun/Verb Syntax
- Selection Sets Practice
- Using Erase

- Using Move
- Using Copy
- Helpful Commands
- Help and Search
- Oops and U
- Undo and redo
- Mredo and Regen

#### Basic Drawing Setup

- Steps for Basic Drawing Setup
- Startup Options
- Drawing Setup Options
- Start from Scratch
- Template
- Table of Start from Scratch Imperial Settings
- Table of Start from Scratch Metric Settings
- Wizard
- Setup Commands
- Units
- Keyboard Input of Units Values
- Limits
- Snap
- Grid
- Dsettings
- Using Snap and Grid
- Introduction to Layouts and Printing
- Model Tab and Layout Tabs
- Why Set Up Layouts Before Drawing
- Printing and Plotting
- Setting Layout Options and Plot Option

#### Object Snap and Object Snap Tracking

- CAD Accuracy
- Object Snap
- Object Snap Modes
- Acquisition Object Snap Modes
- Object Snap Modifiers
- OSNAP Single Point Selection
- OSNAP Running Mode
- Running Object Snap Modes
- Running Object Snap Toggles
- Object Snap Options
- Object Snap Tracking
- To Use Object Snap Tracking



# AutoCAD Level 1

Course ID#: 0650-100-19-W

21 Hrs

- Object Snap Tracking with Polar Tracking
- Object Snap Tracking settings
- OSNAP Applications
- OSNAP Practice

## Draw Commands I

- Draw commands – Simple and Complex
- Draw Command Access
- Coordinate Entry Input Methods
- Commands
- Line
- Circle
- Arc
- Use Arcs or Circles?
- Point
- Ddptype
- Pline
- Pline Arc Segments

## Modify Commands I

- Concepts
- Commands
- Erase and Move
- Rotate and Scale
- Stretch and Lengthen
- Trim and Extend
- Break and Join
- Copy and Mirror
- Offset and Array
- Fillet and Chamfer

## Viewing Commands

- Concepts
- Zoom and Pan with the Mouse Wheel
- Commands
- Zoom and Realtime (RTzoom)
- Pan
- Zoom and Pan with Undo and Redo
- Scroll Bars
- View and Dsvviewer
- Viewres and Ucsicon
- Viewgo and Navswheel
- Qvdrawing and Vports

## Layers and Object Properties

- Concepts
- Assigning colors, Linetypes, and Lineweights
- Object properties
- Plot Styles
- Layers and Layer Properties Controls
- Layer Control Drop-Down List
- Layer Properties Manager Layer List
- Color, Linetype, Lineweight, and other Properties
- Layer Filters
- Displaying an Object's Properties and Visibility Settings
- Laymcur
- Layerp
- Layerstate
- Object-Specific Properties Controls
- Linetype
- Lweight
- Color
- True Color and Color Books
- Setbylayer
- Controlling Linetype Scale
- Ltyscale
- Celtscale
- Changing Object Properties
- Object Properties Toolbar
- Properties
- Matchprop
- Layer Tools

## Advanced Drawing Setup

- Steps for Drawing Setup
- Using and Creating Template Drawings
- Using Template Drawings
- Table of Standard AutoCAD Templates
- Creating Template Drawings
- Additional Advanced Drawing Setup Concepts
- Drawing Setup Using Annotative Objects



## Layouts and Viewports

- Concepts
- Paper Space and Model Space
- Layouts
- Viewports
- Layouts and Viewports Example
- Guidelines for Using Layouts and Viewports
- Creating and Setting up Layouts
- Layoutwizard
- Layout
- Inserting Layouts with AutoCAD DesignCenter
- Setting up the Layout
- Using Viewports in paper Space
- Vports
- Qvlayout
- Scaling the Display of Viewport Geometry
- Locking Viewport Geometry
- Linetype Scale in Viewports-PSLTSCALE
- Vpmax, Vpmin and Scalelistedit
- Advanced Applications of Paper space viewports

## Printing and Plotting

- Concepts
- Typical Steps to Plotting, Printing, Plotting, and Saving Page Setups
- Plot and -Plot
- Viewplotdetails and Pagesetup
- Using the Plot Dialog box & Page Setup Manager
- Preview
- Plotting to Scale
- Standard Paper Sizes
- Calculating the Drawing Scale Factor
- Guidelines for Plotting Model Space to Scale
- Guidelines for Plotting Layouts to Scale
- Tables of Limits Settings
- Mechanical Table of Limits Settings for ANSI Sheet Sizes
- Architectural Table of Limits Settings for Architectural Sheet Sizes
- Metric Table of Limits Settings for Metric (ISO) Sheet Sizes
- Metric Table of Limits Settings for ANSI Sheet Sizes
- Civil Table of Limits Settings for ANSI Sheet Sizes

## Draw Commands II

- Concepts
- Commands
- Xline, Ray, Polygon and Rectang
- Donut, Spline, Ellipse, Divide and Measure
- Mline and Mlstyle
- Multiline Style Dialog box
- New Multiline Style Dialog box
- Editing Multilines
- Sketch
- The SKPOLY Variable
- Solid, Boundary, Region, Wipeout and Revcloud

## Modify Commands II

- Concepts
- Commands
- Considerations for changing Basic Properties of Objects
- Properties, DBLCLKEDIT, Matchprop
- Object Properties Toolbar
- Chprop, Change, Iquick Properties
- Explode, Align
- Find/Replace in the Text Formatting Editor
- Scaletext, Justifytext, Qtext, Textfill
- Substituting Fonts
- Text Fields and Tables
- Text fields, Field, Updatefield
- Creating and Editing Tables
- Table, Tablestyle, Tabledit
- The Table Editor
- Editing tables with Grips
- Editing Tables with the Properties Palette
- Importing and Exporting Tables
- Table Breaks
- Text Fields and Calculations in Tables
- Text Attributes

## Grip Editing

- Concepts
- Grips Features
- Activating Grips on Objects
- Cold and Hot Grips
- Grip Editing Options
- Shift to Turn on ORTHO



# AutoCAD Level 1

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21 Hrs

- Auxiliary Grid
- Editing Dimensions
- Guidelines for Using Grips
- Grips Settings
- Point Specification Precedence
- More Grips

## Blocks, DesignCenter, and Tool Palettes

- Concepts
- Commands
- Block
- Block Color, Linetype, and Lineweight Settings
- Insert, Minsert, Explode, -Insert with \*
- Xplode, Wblock, Base
- Redefining blocks and the Block Editor
- Bedit, Blocks Search Path
- Purge, Rename and Setbylayer
- DesignCenter
- Adcenter
- DesignCenter Options
- To Open a Drawing from DesignCenter
- To Insert a Block Using DesignCenter
- Resulting Scale Factors with Autoscale (Drag-and-Drop)
- Tool Palettes
- Toolpalettes
- Creating and Managing Tool Palettes

## Multiview Drawing

- Concepts
- Projection and Alignment of Views
- Using ORTHO and OSNAP to Draw Projection Lines
- Using Polar Tracking to Draw Projection Lines Aligned with OSNAP Points
- Using Xline and Ray for construction Lines
- Using Offset for Construction of Views
- Realignment of Views Using Polar Snap and Polar Tracking
- Using Construction Layers
- Using Linetypes
- Drawing Hidden and Center Lines
- Managing Linetypes, Lineweights, and Colors
- Creating Fillets, Rounds, and Runouts

- Guidelines for Creating a Typical Three-View Drawing

## Pictorial Drawings

- Concepts
- Types of Pictorial Drawings
- Pictorial Drawings Are 2D Drawings
- Isometric Drawing in AutoCAD
- Snap
- Isometric Ellipses
- Ellipse
- Creating an Isometric Drawing
- Dimensioning Isometric Drawings in AutoCAD
- Oblique Drawing In AutoCAD

## Section Views

- Concepts
- Defining hatch patterns and hatch Boundaries
- Step for Creating a Section View Using the hatch Command
- Hatch
- Hatch and Gradient Dialog box – hatch Tab
- Selecting the Hatch Area
- Expanded Dialog box Options
- Gradient Tab
- -hatch command Line Options
- Annotative hatch Patterns
- Toolpalettes
- Creating Tool Palettes
- Editing hatch Patterns and Boundaries
- Hatchedit
- Using Grips with Hatch Patterns
- Using Trim with Hatch Patterns
- Object Selection Features of Hatch Patterns
- FILLMODE for Solid Hatch Fills
- Draworder and Texttofront
- Drawing Cutting Plane Lines

## Auxiliary Views

- Concepts
- Constructing an Auxiliary View
- Setting up the Principal Views
- Using Snap Rotate and ORTHO
- Rotating SNAP Back to the Original Position



- Using Polar Tracking
- Using the Offset Command
- Using the Xline and Ray Commands
- Constructing Full Auxiliary Views

## Dimensioning

- Concepts
- Dimension Drawing Commands
- Dimlinear, Dimaligned, and Dimbaseline
- Dimcontinue, Dimspace, and Dimjogline
- Dimdiameter, Dimradius, Dimjog and Dimarc
- Dimcenter, Dimangular, and Dimbreak
- Leader, Qleader and Annotation Tab
- Leader Line and Arrow Tab
- Mleader, Mleaderstyle and Mleaderedit
- Mleaderalign, Mleadercollect and Dimordinate
- Qdim and Tolerance
- Editing Feature Control Frames
- Basic Dimensions
- GDT-Related Dimension Variables
- Geometric Dimensioning and Tolerancing
- Diminspect
- Editing Dimensions
- Grip Editing Dimensions
- Dimension Right-Click Menu
- Exploding Associative Dimensions
- Dimension Editing Commands
- Dimtedit, Dimedit and Properties
- Customizing Dimensioning Text
- Associative Dimensioning
- Dimreassociate, Dimdisassociate and Dimregen
- Dimensioning Variables Introduction

## Dimension Styles and Variables

- Concepts
- Dimension Variables
- Dimension Styles
- Dimension Style Families
- Dimension Style Overrides
- Dimension Styles
- Dimstyle and Ddim
- -Dimstyle
- Dimension Variables

- Changing Dimension Variables Using the Dialog Box Method
- Lines Tab (Dimension Lines & Extension Line)
- Symbols and Arrows Tab (Arrowheads & Other)
- Text Tab (Appearance, Placement & Alignment)
- Fit Tab (Scale for Dimension, Fit Options, Text Placement and Fine Tuning)
- Primary Units Tab (Linear Dimensions, Measurement Scale, Zero Suppression, and Angular Dimensions)
- Alternate Units Tab (Alternate Units Section, Zero Suppression, and Placement Section)
- Tolerances Tab (Tolerance Format, and Alternate Unit)
- Changing Dimension Variables Using Command Line Format
- DIM (Variable name)
- Associative Dimensions
- Using Setup Wizards and Template Drawings
- Modifying Existing Dimensions
- Modifying a Dimension Style (Properties)
- Creating Dimension Style Overrides and using Update (Update, Dimoverride and Matchprop)
- Dimension right-Click Menu
- Guidelines for Non-Annotative Dimensioning in AutoCAD
- Dimensioning in a Single Drawing
- Creating Dimension Styles as Part of Template Drawings
- Optional Method for Fixed Dimension Text height in Template Drawings
- Dimensioning in Paper Space Layouts
- When to Dimension in Paper Space
- Procedure for Dimensioning in Paper Space
- Annotative Dimensions
- Dimensioning Isometric Drawings

## Advanced Layouts, Annotative Objects & Plotting

- Concepts
- Advanced Layouts
- Layer Visibility for Viewports
- Layer and Vplayer
- Layer Property Overrides
- Linetype Scale in Viewports (PSLTSCALE)



# AutoCAD Level 1

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21 Hrs

- Dimensioning in Paper Space
- The “Reverse Method” for Calculating Drawing Scale Factor
- Steps for Calculating the Drawing Scale Factor by the “Reverse Method
- Annotative Objects
- Setting Annotation Scale and Viewport Scale
- Creating and Displaying Annotative Objects in Multiple viewports
- SELECTIONANNODISPLAY
- Adding and Deleting Scale Representations for Annotative Objects
- Objectscale
- Adjusting Positions for Individual Annotative Object Scale Representations
- Annoreset
- ANNOALLVISIBLE
- Annoupdate
- SAVEFIDELITY
- Linetype Scales for Annotative Drawings
- MSLTSCALE
- Applications for Multiple viewports
- Using Two Layouts to Plot the Same Geometry at Different Scales
- Using Two Viewports to Display the Same Geometry at Different Scales
- Using One Layout to Plot Xref Drawings in Multiple Viewports at Different Scales
- Plot Style Tables and Plot Styles
- What is the Difference between a Plot Style and a Plot Style Table?
- Color-Dependent and Named Plot Style Tables
- Attaching a Plot Style Table to a layout
- Stylesmanager
- Creating a Plot Style Table
- Editing Plot Styles
- Assigning Named Plot Styles to Objects
- Plotstyle
- Convertpstyles and convertctb
- Plot Stamping (Plotstamp)