

Syllabus of AutoCAD

AutoCAD 2016 (Fundamentals + Advanced)

1. Creating a Simple Drawing

Getting Started with AutoCAD

- o Starting AutoCAD
- o AutoCAD's Screen Layout
- o Working with Commands
- o Opening an Existing Drawing File
- o Saving Your Work
- o AutoCAD's Cartesian Workspace

Basic Drawing & Editing Commands

- o Drawing Lines
- o Erasing Objects
- o Drawing Lines with Polar Tracking
- o Drawing Rectangles
- o Drawing Circles
- o Viewing Your Drawing
- o Undoing and Redoing Actions

2. Making Your Drawings More Precise

Drawing Precision in AutoCAD

- o Using Object Snap
- o Object Snap Overrides

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- o Polar Tracking Settings
- o Object Snap Tracking
- o Drawing with SNAP and GRID

Making Changes in Your Drawing

- o Selecting Objects for Editing
- o Moving Objects
- o Copying Objects
- o Rotating Objects
- o Scaling Objects
- o Mirroring Objects
- o Editing Objects with Grips

3. Drawing Organization and Information

Organizing Your Drawing with Layers

- o Creating New Drawings With Templates
- o What are Layers?
- o Layer State
- o Changing an Object's Layer

Advanced Object Types

- o Drawing Arcs
- o Drawing Polylines
- o Editing Polylines
- o Drawing Polygons
- o Drawing Ellipses

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Getting Information From Your Drawing

- Measuring Objects
- Working with Properties

4. Creating More Complex Objects

Advanced Editing Commands

- Trimming and Extending
- Stretching Objects
- Creating Fillets and Chamfers
- Offsetting Objects
- Creating Arrays of Objects

Inserting Blocks

- What are Blocks?
- Inserting Blocks from Tool Palettes
- Inserting Blocks using Insert
- Inserting Blocks with DesignCenter

5. Preparing to Print

Setting Up a Layout

- Printing Concepts
- Creating Viewports
- Setting up Layouts
- Guidelines for Layouts

Printing Your Drawing

- Printing Layouts
- Printing a Check Plot

6. Annotating Your Drawing

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Text

- o Working with Annotations
- o Adding Text in a Drawing
- o Modifying Multiline Text
- o Formatting Multiline Text

Hatching

- o Hatching

Adding Dimensions

- o Dimensioning Concepts
- o Adding Linear Dimensions
- o Adding Radial and Angular Dimensions
- o Editing Dimensions
- o Adding Notes to Your Drawing

7. Beyond the Basics

Working Effectively with AutoCAD

- o Setting up the Interface
- o Using the Keyboard Effectively
- o Working in Multiple Drawings
- o Using Grips Effectively
- o Additional Layer Tools

Accurate Positioning

- o Coordinate Entry
- o Locating Points with Tracking
- o Construction Lines
- o Placing Reference Points

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8. Creating and Organizing Blocks

Creating Blocks

- o Creating Blocks
- o Editing Blocks
- o Removing Unused Elements

Blocks in Tool Palettes

- o Adding Blocks to Tool Palettes
- o Modifying Tool Properties in Tool Palettes

9. Drawing Setup and Utilities

Creating Templates

- o Why Use Templates?
- o Controlling Units Display
- o Creating New Layers
- o Adding Standard Layouts to Templates
- o Saving Templates

Annotation Styles

- o Creating Text Styles
- o Creating Dimension Styles
- o Creating Multileader Styles

10. Advanced Layouts and Printing

Advanced Layouts

- o Creating and Using Named Views
- o Creating Additional Viewports
- o Layer Overrides in Viewports
- o Additional Annotative Scale Features

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DWF Printing and Publishing

- o DWF Plotting and Viewing
- o Publishing Drawing Sets

11. Other Topics

- o How to Use Quick Calc
- o Additional Zoom Commands
- o Creating Model Space Viewports
- o Advanced Object Selection
- o Single-Line Text
- o Other Text Tools
- o Additional Dimensioning Tools
- o Creating Boundaries
- o Working with Regions
- o Temporary Overrides

12. AutoCAD 2016 3D Drawing and Modelling

3D Foundations

- Why use 3D?
- Introduction to the 3D Modeling Workspace
- Basic 3D Viewing Tools
- 3D Navigation Tools
- Introduction to the User Coordinate System

Simple Solids

- Working with Solid Primitives
- Solid Primitive Types
- Working with Composite Solids

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Working with Mesh Models

Creating Solids & Surfaces from 2D Objects

- Complex 3D Geometry
- Extruded Solids and Surfaces
- Swept Solids and Surfaces
- Revolved Solids and Surfaces
- Lofted Solids and Surfaces

Advanced Solid Editing

- Editing Components of Solids
- Editing Faces of Solids
- Fillets and Chamfers on Solids

Working Drawings from 3D Models

- Creating Multiple Viewports
- 2D Views from 3D Solids

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Syllabus of CREO Parametric

Part-A: Part modelling and assembly

Module-1 Introduction to Creo-2 modelling and basic concepts

Module-2 Using the creo-2 interface

Module-3 Selecting and Editing

Module-4 Sketcher geometry

Module-5 Creating datum Features: Planes and Axes

Module-6 Creating extrudes, Revolves and Ribs

Module-6 Creating sweeps and blends

Module-7 Creating holes, shells and drafts, Creating rounds, chamfers

Module-8 Copy and mirror tools

Module-9 Creating patterns

Module-10 Assembling with constraints

Module-11 Exploding assemblies

Module-12 Using layers

Module-13 Managing design intent

Module-14 Resolving failures and seeking help

Part-B: Surface modelling

Module-1 Surface modelling overview

Module-2 Advance selection

Module-3 Basic Surfacing tools

Module-4 Helical Sweep

Module-5 Creating and editing solids using quilts

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Part-C Sheetmetal Design

Module -1 Introduction to Sheetmetal design process

Module-2 Sheetmetal model fundamentals

Module-3 Creating primary and secondary Sheetmetal, Wall features

Module-4 Modifying Sheetmetal models

Module-5 Sheetmetal Bends

Module-6 Setting the Sheetmetal environment

Part-D Detailing of Drawings

Module-1 Introduction to drawings

Module-2 Creating new drawings and views

Module-3 Adding details to drawings

Module-4 Adding notes to drawings

Module-5 Adding tolerance and symbols

Module-6 Using layers in drawings

Module-7 Creating reports (BOM)

Extra topics covered

Application of mechanisms to assemblies

Creating animation clips of various assemblies and models

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ANSYS Course Duration: One Week

Day 1 - Fundamentals of Strength of Materials and FEM

Session 1:

Overview of FEM

FEA Model Entities (Nodes and Elements)

Strength of Materials

Stiffness and Strength

Plane stress, Plane strain, Stiffness Matrix

Stiffness Method and Flexibility Method

ANSYS Products

Overview of Boundary conditions,

General analysis procedure.

Introduction to ANSYS and Basic usage.

Workshops

ANSYS GUI

Memory management.

Picking and plotting.

Coordinate systems.

Logic picking and component manager

Session 2:

Demonstrations of 1D Elements.

General procedure for Link and Beam Modeling

General Procedure for Meshing

General Procedure for Post processing

Solving UDL and UVL Problems

Resolving Loads

Finding SFD and BMD

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Day 2 - Solving Basic Linear Static Structural Analysis

Session 3:

Introduction to 2D Elements

2D Element Behavior

Plane Stress

Plane Strain

Axisymmetry

General procedure for Modeling, Loading and Post processing

Workshops

Working with Symmetry BC's

Session 4:

Introduction to 3D Elements

Modeling Options

Glue

Overlap and other Boolean operations

Working with Co-ordinate system (Local, Global and User defined)

Importing Solid Models

Workshops

Creating Solid Model

Day 3 - Finite Element Modeling

Session 5:

Creating finite element models (meshing).

Element attributes

Mesh controls

Generating Mesh

Free mesh

Mapped Mesh

Sweep Mesh

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Session 6:

Preparing Models for Mesh

Mesh Import

Meshing Workshop

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Day 4 - Introduction to Dynamic Analysis

Session 7:

Overview of FEM applied to Basic Dynamics.

Modal analysis.

General procedure for Loading and Post processing

Workshops.

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Session 8:

Harmonic analyses

Transient analyses

Workshops

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Day 5 - Introduction to Thermal Analysis

Session 9:

Overview of Basic Heat transfer.

Elements used in Thermal Analysis

Loads and BC's

Solution of Conduction problems.

Solution of Convection problems.

Workshops.

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Session 10:

Introduction to Multiphysics Analysis

Solving Thermal – Structural problems (Coupled field analysis).

Workshops.

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Summary and Case studies

Effect of Pre-stress on natural frequency for an impeller (Pre stressed Modal analysis).

Heat transfer analysis on Heat sinks.

Stress analysis of a Hydraulic Press frame.

Fatigue life calculations on a connecting rod.

Questions & Answers.

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