

**Course:** AutoCAD 2023 – 3D Drawing & Modeling (Level 3)

**Contact Hours:** 30

**Pre-requisite:** AutoCAD 2023 – 2D Drafting (Level 2)

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## **Abstract**

The Primary objective of this courseware is to teach students the most efficient commands necessary for professional 3D drawings. AutoCAD users don't realize the 3D capabilities of AutoCAD, so they end up using other software (such as 3ds Max or Maya) to build 3D models, create lights and materials, and create still rendered images and animation. This course clears up this misunderstanding and introduces the real power of AutoCAD in 3D.

## **Target Audience**

- Engineers
- Students
- Draftsman
- Surveying Technicians

## **Learning Outcomes**

On completion of this course, learners will be able to:

1. AutoCAD 2017 3D Basics
2. Creating Solids
3. Creating Meshes
4. Creating Surfaces
5. Creating Complex Solids & Surfaces
6. Solid Editing Commands
7. 3D Modifying Commands
8. Converting and Sectioning
9. Printing in 3D and Creating 3D DWF Files
10. Cameras and Lights
11. Materials, Rendering, Visual Styles and Animation

# Course Content

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## 1. AutoCAD 3D Basics

- What is 3D Modeling?
- 3D Templates and Workspaces
- 3D Viewing Commands
- UCS, DUCS

## 2. Creating Solids

- Create solid models
- Manipulating solids
- Use the Press Pull Command
- 3D OSNAPS
- Sub objects and gizmos

## 3. Creating Meshes

- Basic Mesh shapes
- Mesh Sub-objects and Gizmos
- Creating meshes from 2D objects
- Converting, smoothing, refining, and creasing
- Face editing commands

## 4. Creating Surfaces

- Creating Surfaces using Planar, Network
- Blend, Patch, and Offset
- Editing Surfaces
- Nurbs and control vertices

## 5. Creating Complex Solids & Surfaces

- 3D Poly and Helix commands
- Extrude command
- Loft command
- Revolve command
- Sweep command

## 6. Solid Editing Commands

- Solid face manipulation commands
- Solid edge manipulation commands
- Solid body manipulation commands

## 7. 3D Modifying Commands

- 3D Move, 3D Rotate, 3D Scale
- 3D Array, 3D Align
- Filletting and Chamfering solids

## **8. Converting and Sectioning**

- Converting Objects
- Sectioning using the Slice command
- Use the Section plane command
- Use the Flat-shot command

## **9. Printing in 3D and Creating 3D DWF Files**

- Named Views and Viewports
- Drawing Views
- Creating and viewing 3D DWF files

## **10. Cameras and Lights**

- Creating and Controlling Cameras
- Creating and Editing Lights

## **11. Materials, Rendering, Visual Styles and Animation**

- Materials Mapping
- Rendering
- Visual style
- Animation

## Assessment Criteria

In order to achieve Learning Outcome...	The Learner must...
1. AutoCAD 3D Basics	Demonstrate the creation of templates, workspaces and use the 3D viewing commands and set up DUCS.
2. Creating Solids	Use solid models and manipulate them with the press-pull command. Also work with the sub objects and gizmos to be able to modify solid models to a greater extent.
3. Creating Meshes	Make simple meshes and use editing commands to manipulate faces.
4. Creating Surfaces	Incorporate Planar, network, blend, patch and offset commands to a variety of surfaces.
5. Creating Complex Solids & Surfaces	Create 3d helix and utilize the extrude, loft, revolve and sweep commands and apply them to a project.
6. Solid Editing Commands	Work with solid models and be able to edit faces, edges and body in a variety of exercises.
7. 3D Modifying Commands	Be able to distinguish the added features in 3D as opposed to 2D for commands such as move, rotate, scale, array, align, fillet and chamfer and use them in practice align, fillet and chamfer and use them in practice exercises.
8. Converting and Sectioning	Use the commands given to convert one model to another under supervision of an instructor whilst cutting sections and creating views in 2D and 3D.
9. Printing in 3D and Creating 3D DWF Files	Set up 3D view ports and views in DWF format for publishing and printing projects.
10. Cameras and Lights	Setup cameras for a project and create views from many diverse angles. Use the effects of lighting in AutoCAD to embellish a 3D drawing.
11. Materials, Rendering, Visual Styles and Animation.	Use the materials manager to create and edit materials to size and scale. Utilize renderings to save still shots of a project while creating short video clips.

### Essential Learning Resources:

#### Textbook

AutoCAD 2017 3D Modeling – by Munir Hamad

#### Websites

<http://www.sbcs.edu.tt/>

<http://www.autodesk.com/>