



AutoCAD® Self-paced Learning Modules

# AutoCAD 3D

## Content Module

### Contents and Learning Outcomes

#### **Module Introduction 1 - Using the AutoCAD Modules**

#### **Module Introduction 2 - Configuring Your AutoCAD Software**

#### **Module 1 - Viewing 3D Models - Part 1**

1. Describe wireframe models and explain how they are viewed in 3D.
2. Describe the UCS icon and explain how to configure and display it.
3. Describe and apply the commands UCSICON, VIEW and 3DORBIT.

#### **Module 2 - Checking the Accuracy of Your Models**

4. Describe how lab exercise models are checked for accuracy.

#### **Module 3 - World Coordinate System**

5. Describe the world coordinate system, the UCS icon and the right-hand rule.
6. Draw 3D models with the UCS located at the world coordinate system.

#### **Module 4 - User Coordinate System - Part 1**

7. Describe the user coordinate system and the user construction plane.
8. Describe and apply the command UCSMAN.
9. Draw 3D models using the user coordinate system located in the world or orthographic UCS locations only.

#### **Module 5 - User Coordinate System - Part 2**

10. Describe and apply the UCS command to locate and orientate the UCS to any location necessary for model construction.
11. Draw 3D models using the UCS command to locate and orientate the UCS.

#### **Module 6 - Competency Test No. 1**

12. Within a one and one-half hour time limit, complete a written exam and a lab exercise without the aid of a key.

#### **Module 7 - Visualizing Multiview Drawings**

13. Sketch isometric drawings on grid paper from multiview drawings.
14. Construct 3D models in AutoCAD using multiview drawings.

#### **Module 8 - Modifying 3D Models - Part 1**

15. Describe and apply the TRIM and EXTEND commands when trimming and extending in wireframe modeling.
16. Describe and apply the command ROTATE3D to rotate 3D models..

**Module 9 - Modifying 3D Models - Part 2**

17. Describe and apply the commands 3DARRAY, MIRROR3D to construct and modify 3D models.

**Module 10 - Viewing 3D Models - Part 2**

18. Describe and apply the VSCURRENT and SHADEMODE commands to change the display of 3D surface or solid models in the different shade modes available.

19. Describe and apply the more advanced options of the 3DORBIT command.

**Module 11 - Competency Test No. 2**

20. Within a three hour time limit, complete a written exam and the lab exercises without the aid of a key.

**Module 12 - Surface Modeling - Part 1**

21. Describe surface faces and meshes and explain when and why they are used.

22. Describe and apply the commands 3DFACE and AI\_MESH to create simple face and mesh surfaced models.

**Module 13 - Surface Modeling - Part 2**

23. Describe a geometry defined mesh including a rule surface, a revolved surface and a tabulated surface.

24. Describe and apply the commands RULESURF, REVSURF, and TABSURF to apply mesh surfaces to 3D models.

**Module 14 - Surface Modeling - Part 3**

25. Describe a complex surface mesh and a region.

26. Describe and apply the commands 3DMESH, REGION and SUBTRACT.

**Module 15 - Surface Modeling - Part 4**

27. Describe a 3D polyline and how it compares to a 2D polyline.

28. Describe and apply the 3DPOLY command and draw 3D polylines.

29. Describe and apply the EDGESURF command.

30. Describe and apply the commands and system variables PEDIT, SURFTYPE, SPLFRAME, SURFV and SURFU to modify the appearance of 3D meshes.

**Module 16 - Competency Test No. 3**

31. Within a five hour time limit, complete a written exam and the lab exercises without the aid of a key.

**Module 17 - Solid Modeling - Part 1**

32. List the six solid primitives.

33. Describe and apply the BOX, WEDGE, CYLINDER, UNION and SUBTRACT commands to draw solid models using solid primitives.

**Module 18 - Solid Modeling - Part 2**

34. Describe and apply the EXTRUDE and REVOLVE commands to draw solid models.

**Module 19 - Solid Modeling - Part 3**

35. Describe how the UNION, SUBTRACT and INTERSECT commands are used and applied when solid modeling.
36. Describe and apply the INTERSECT, FILLET and CHAMFER commands to construct solid models.

**Module 20 - Sectioning Solids**

37. Describe and apply the SLICE command to cut solid models into two individual solids.
38. Describe and apply the SECTION command to create 2D cross sectional regions through solid models.

**Module 21 - Competency Test No. 4**

39. Within a four hour time limit, complete a written exam and the lab exercises without the aid of a key.

**Module 22 - Editing Solids - Part 1**

40. Describe and apply the SOLIDEDIT command and the options in the command to edit faces of solid models.

**Module 23 - Editing Solids - Part 2**

41. Describe and apply the SOLIDEDIT and SOLIDCHECK commands to modify solid models.
42. Describe and apply the INTERFERE command to find interferences between two or more solids.

**Module 24 - Mass Properties**

43. Describe and apply the MASSPROP commands to find the mass properties of solid models.

**Module 25 - Creating 2D Drawings from 3D Models**

44. Describe and apply the SOLVIEW, SOLDRAW and SOLPROF commands to convert a solid model into a 2D drawing complete with hidden lines and dimensions.

**Module 26 - Competency Test No. 5**

45. Within a three hour time limit, complete a written exam and the lab exercises without the aid of a key.