



GOVERNMENT OF TAMILNADU  
DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI

**STATE PROJECT COORDINATION UNIT**

*(Established Under Canada India Institutional Cooperation Project)*

**CURRICULUM**

Course Name	AUTOCAD 3D
Course Code	CE / 2020 / 002
Course Duration	60 Hours
Minimum Eligibility Criteria and Pre-requisites (if any)	10 <sup>th</sup> / +2/Diploma/Graduates
Course Objectives	<p>Training Module has been designed for the Participants to</p> <ul style="list-style-type: none"> <li>• Create and modify simple and complex 3D solids and surfaces</li> <li>• Understand 3D geometry from 2D drawings</li> <li>• Set up a rendering with materials and lights</li> <li>• Understand 2D documentation from 3D geometry</li> </ul>
Course Outcomes	<p>At the end of the training, participants will be able to</p> <ul style="list-style-type: none"> <li>• Create 3D models from 2D designs.</li> <li>• Use solid modelling, surface modelling and mesh modelling techniques.</li> <li>• Create full working drawings of your 3D models</li> <li>• Produce visualisations of models, incorporating lighting and materials.</li> </ul>
Expected Job Roles	3D CAD Modeller, 3D CAD Designer

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
CE / 2020 / 002	AUTOCAD 3D	Theory	20	10	20	3 Hours
		Practical	40	40	80	
		<b>Total</b>	<b>60</b>	<b>50</b>	<b>100</b>	

**DETAILED SYLLABUS**

Unit No	Modules	No of Hours	
		Theory	Practical
I	<b>INTRODUCTION TO 3D MODELING</b>		
	Introduction to 3D - Launch Auto CAD - 3D Basics Interface - 3D Modeling Interface - View Ports – Thickness, Elevation, Hide, Shade Command - Basic commands - UCS icon, 3D coordinator, Draw tool bar, Modify tool bar	05	05
II	<b>EDITING MODELS</b>		
	3D Model Objects (Wire Frames, Surface Solids), 2D Solids - 3D Faces - Basic 3D Surfaces (Basic Mesh Command, Mesh Box, Mesh Cone, Mesh Cylinder, Mesh Pyramid, Sphere, Wedge, Torus, Tessellations, Smooth) - 3D Edits (Convert to Solid, Convert to Surface, 3D Move, 3D Rotate, 3D Align, 3D Mirror.	05	05
III	<b>CREATING DRAWINGS FROM 3D MODELS</b>		
	Creating Solids (Solid Primitives, Poly Solid Command, Extrude, Extrude with Taper, Extrude with Path) - Solid Composite (Union, Subtract, Intersect, Thicken).	05	05
IV	<b>VISUALIZATION</b>		
	Visualizing your Model - Hide Command, Visual Styles, Visual Styles Manager, 3D Navigation – Camera - Viewing a Camera, Camera Preview, Camera Properties, Displaying & Plotting a Camera, Adjusting Camera Distance, Dview, Walk & Fly, Walk & Fly Setting, Animation Paths	05	05
	PRACTICAL EXERCISES	---	20
<b>TOTAL THEORY AND PRACTICAL HOURS</b>		<b>20</b>	<b>40</b>
<b>TOTAL HOURS</b>		<b>60</b>	

<b>PRACTICAL EXERCISES (20 HOURS)</b>	
<b>S.NO.</b>	<b>List of Experiments</b>
1.	3D View, Rendering, Camview of Wall
2.	3D View, Rendering, Camview of Window
3.	3D View, Rendering, Camview of Door
4.	3D View, Rendering, Camview of Stair
5.	3D View, Rendering, Camview of Prayer hall
6.	3D View, Rendering, Camview of Single Bed Room

### **HARDWARE REQUIREMENT**

<b>SL. NO.</b>	<b>LIST OF TOOLS / EQUIPMENTS / MATERIALS</b>
1.	CPU –64bit Intel® or AMD® multi-core processor
2.	RAM - 4 GB of RAM minimum (8 GB or more recommended)
3.	DISK SPACE -6 GB of free disk space for install
4.	VGA MONITOR
5.	USB KEYBOARD
6.	USB OPTICAL MOUSE

### **SOFTWARE REQUIREMENT**

<b>SL. NO.</b>	<b>NAME OF THE SOFTWARE</b>
1.	AUTOCAD 3D 2019

### **REFERENCE BOOKS**

<b>SL. NO</b>	<b>NAME OF THE BOOK</b>	<b>AUTHOR</b>	<b>PUBLISHER</b>
1.	AutoCAD 3D Tutorials	Kristen	Autodesk
2.	A Detailed Guide to Modeling, 3D View, Rendering	Kurland. S.	Autodesk

## ASSESSMENT AND CERTIFICATION

S.No	Criteria for Assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the CIICP Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 Word/Objective type questions).
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the CIICP Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in the End Theory and Practical examination.
6.	On successful completion of training, Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

## END EXAMINATION

### ALLOCATION OF MARKS

S. No.	Description	Maximum Marks
1.	THEORY EXAM	20
2.	PRACTICAL EXAM	
	a. CREATING A 3D OBJECT	20
	b. MODELING, SURFACE MODELING, RENDERING	30
	c. RESULT / OUTPUT	10
	d. RECORD	20
<b>Total</b>		<b>100</b>

## **THEORY MODEL QUESTION PAPER**

**CE / 2020 / 002 – AUTOCAD 3D**

(Maximum Marks: 20)

(N.B: Answer any **Twenty** Questions)

**20 x 1 = 20 Marks**

**1. Which command converts discrete object to a polyline?**

- a) merge
- b) union
- c) join
- d) add

**2. The command which is used to set the viewpoint in 3D space for viewing the 3D models is .....**

- a) 3D FACE
- b) VPOINT
- c) UCS
- d) ELEV

**3. A wireframe model is created using .....**

- a) 2D objects with the extrude command
- b) 2D objects such as points, lines & circles
- c) 3D objects such as spheres & cones
- d) 3D commands such as revolve & tabsurf

**4. What is the extension for 3D modelling file?**

- a) 0.3d
- b) 0.3dm
- c) 0.3m
- d) 0.3dmo

**5. Which command allows you to change 2D drawing into 3D model?**

- a) 3D modelling
- b) Extrude
- c) plan
- d) ortho

**6. What is the full form of WCS?**

- a) Western co-ordinate system
- b) World co-ordinate system
- c) Wide co-ordinate system
- d) Wrong co-ordinate system

**7. What is the shortcut for grid command?**

- a) F6
- b) F7
- c) F8
- d) F9

**8. What is the key for 3D OSNAP?**

- a) F1
- b) F2
- c) F3
- d) F4

**9. The conceptual visual style tool is located on the ..... toolbar**

- a) Visual styles
- b) Modify
- c) 3D modeling
- d) All of the above

**10. The axis used to show depth in AUTOCAD is the**

- a) W axis
- b) X axis
- c) Y axis
- d) Z axis

### 11. What is the shortcut for rendering an image?

- [illegible]

**12. What is the shortcut key for design centre palette?**

- a) ctrl + 1                      b) ctrl + 2  
c) ctrl + 3                      d) ctrl + 4

**13. The free orbit tool is found on the ..... tool bar.**

- a) rotate                      b) move  
c) modify                     d) 3D move

**14. What is the command used in toggle between isometric planes?**

- a) ctrl + E                      b) ctrl + F  
c) ctrl + G                      d) ctrl + H

**15. What is the Shortcut key for polar?**

- a) F8                                      b) F9  
c) F10                                     d) F11

**16. Which command allows you to change the direction and origin of construction plane?**

- a) plane                                      b) splane  
c) c-plane                                    d) o-plane

**17. Surface models are used mostly in .....**

- a) modeling mechanical parts
- b) creating architectural models
- c) modeling complex electrical systems
- d) modeling complex curves in boat hulls & car fenders

**18. How many points do you need to define the rectangle commands?**

- a) 2                                  b) 3  
c) 4                                  d) 5

19. Shortcut key for creating an arc is .....

- a) AR                                      b) A  
c) AC                                      d) None of these

20. The command for opening drawing units window is .....

- a) UN                                      b) U  
c) UNIT                                  d) UNITS

21. Ctrl + y is .....

- a) to cut a drawing                      b) to copy a drawing  
c) to paste a selected drawing        d) to redo

**22. What 3D AutoCAD command would you use to determine, if two parts (3D solids) will fit together without any interference?**

- a) Fit
- b) Union
- c) Subtract
- d) Interfere

**23. What type of AutoCAD object do you now have officially, if you apply a property called thickness to a standard AutoCAD circle?**

- a) Surface model
- b) Solid model
- c) Cylinder
- d) Region

**24. Which one of the following is not a surface primitives?**

- a) Box
- b) Cone
- c) Spiral
- d) Dish

**25. Which one of the following is not an example of surface primitives?**

- a) Sphere
- b) Cone
- c) Dome
- d) Pyramid

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