INSTITUTE OF DESIGN
Nirma University
Communication Design, Semester VI

Institute:	**Institute of Design**
Name of Programme:	**Bachelor of Design**
Course Code:	**3DD108MC26**
Course Title:	**3D Modeling**
Course Type:	(■ Core/ ☐ Value Added Course/ ☐ Departmental Elective/ Institute Elective/ University Elective/ Open Elective/ Any other)
Year of introduction:	**Academic Year 2026-27**

L	**T**	**Practical component**				**C**
		LPW	**PW**	**W**	**S**	
1	1	4				4

Course Learning Outcomes (CLO):

At the end of the course, the student will be able to:

1. Learn fundamental 3D visualisation techniques, CAD concepts and workflows used in the design industry (BL 1)
2. Apply 3D modeling, texture mapping and shading techniques to create 3D assets (BL 3)
3. Create realistic visual outputs with camera composition and by applying cinematic lighting and rendering techniques (BL 6)
4. Construct and animate basic skeletal rigs using different 3D assets (BL 6)
5. Produce a complete 3D scene by integrating modeling, texturing, lighting, rendering, and animation techniques (BL 6)

Content: **Total Teaching hours: 90 Hrs.**

Units	Content	Teaching hours
Unit 1	**Introduction to 3D CAD:** • 3D Modeling Applications • Viewing Modes and Spatial Projections • Geometric Foundations and Mesh Elements • Workspace Editing and Navigation	**12 Hrs.**
Unit 2	**Modeling & Texturing:** • 3D Modeling Techniques: Polygonal, NURBS, Parametric, Digital sculpting, Photogrammetry • UV Mapping and Coordinate Wrapping • Material Formulation and Shading Systems	**18 Hrs.**

Unit 3	**Lighting and Rendering:** • Cinematic Lighting Techniques: Three-Point Lighting, IBL (Image Based Lighting), HDRI (High Dynamic Range Imaging) • Camera Rigging, Framing, and Composition • Rendering Paradigms and Production Workflows	**18 Hrs.**
Unit 4	**Rigging and Animation:** • Skeletal rigs and rigging systems • 3D Animation workflows: Storyboarding, Scene setup, Project and Asset management	**18 Hrs.**
Unit 5	**Creating a 3D scene/film clip:** • Pre-Production and Creative Ideation • 3D Production and Asset Management Workflows	**24 Hrs.**

Self Study	**Maintain a journal of the following:** Watch and analyse 3D Animated films: Love, death & robots, Toy Story, Secret Level, Wall-E, Disney-Pixar productions etc.
Class Test	1
Suggested Readings/ References	**Books** 1. Blender Foundation. (2024), *Blender Studio Training*. Blender Foundation, Netherlands. 2. Williams, R. (2012), *The Animator's Survival Kit*. Faber & Faber, UK. 3. Vaughan, W. (2012), *Digital Modeling*. New Riders, USA. 4. Beane, A. (2012), *3D Animation Essentials*. Sybex, USA. 5. Birn, J. (2013), *Digital Lighting and Rendering* (3rd Edition). New Riders, USA. 6. Kerlow, I. V. (2009), *The Art of 3D Computer Animation and Effects* (4th Edition). Wiley, USA. 7. Blair, P. (1994), *Cartoon Animation*. Walter Foster Publishing, USA. 8. Murdock, K. L. (2023), *Autodesk Maya 2024 Basics Guide*. SDC Publications, USA. *(Useful for understanding universal 3D concepts applicable to Blender.)* **Online Resources** 1. Blender Foundation. (2024), *Blender Manual*. https://docs.blender.org/manual/en/latest/ 2. Blender Foundation. (2024), *Blender Studio*. https://studio.blender.org/ 3. Blender Foundation. (2024), *Blender YouTube Channel*. https://www.youtube.com/@BlenderOfficial 4. CrossMind Studio. (2024), *CrossMind Studio YouTube Channel*. https://www.youtube.com/@CrossMindStudio 5. Blender Guru. (2024), *Blender Guru*. https://www.blenderguru.com/ 6. Grant Abbitt. (2024), *Grant Abbitt YouTube Channel*. https://www.youtube.com/@grabbit 7. CG Cookie. (2024), *CG Cookie – Blender Training*. https://cgcookie.com/

	8. Polygon Runway. (2024), *Polygon Runway YouTube Channel*. https://www.youtube.com/@PolygonRunway

w.e.f. AY 2026-27 onwards