

NIRMA UNIVERSITY

Institute:	Institute of Design
Name of Programme:	Bachelor of Design (Product and Interaction Design Prog.)
Course Code:	2DD109CC25
Course Title:	Visualisation and Representation Techniques II
Course Type:	Core
Year of introduction:	2025-26

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Course Learning Outcomes (CLO):

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

1. Apply 2D digital methods to create and refine design sketches (BL 3)
2. Produce accurate 3D digital models and renderings to communicate form and material (BL 3)
3. Integrate AI-assisted tools to enhance visual outputs within a design workflow (BL 4)
4. Create professional-quality presentations by synthesizing multiple digital representation methods (BL 6)

Contents

**Teaching
Hours
(Total 90)**

Unit 1	Digital Mediums for 2D Representation	36
	<ul style="list-style-type: none"> • Introduction to digital sketching and illustration as an extension of analog drawing. • Understanding line, tone, colour, and texture in digital 2D graphics. • Layering, annotation, and compositional techniques for effective communication. • Application of 2D digital methods to accelerate ideation and provide clarity in design presentations. 	
Unit 2	CAD Modeling and Rendering for Realistic Visualisation	36
	<ul style="list-style-type: none"> • Fundamentals of CAD-based 3D modelling: curves, surfaces, solids, and assemblies. • Transition from sketches to models: translating conceptual forms into accurate digital geometry. • Principles of rendering: light, shadow, reflections, textures, and environmental context. • Producing realistic visualizations that simulate materiality and scale for stakeholder communication. 	

Unit 3 AI Tools for Design Visualisation and Representation

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- Role of AI in augmenting design visualisation: generative ideation, variation, and enhancement.
- Exploring AI-based workflows for sketch refinement, rendering augmentation, and form exploration.
- Integrating AI outputs with traditional digital sketches and CAD renders.

Self Study:

Suggested Readings/References:

Books:

1. Scott Robertson (2014). *How to Render: The Fundamentals of Light, Shadow and Reflectivity*. Design Studio Press.
2. Koos Eissen & Roselien Steur (2007). *Sketching: Drawing Techniques for Product Designers*. BIS Publishers.
3. Erik Olofsson & Klara Sjöln (2006). *Design Sketching*. KEEOS Design Books.

Online Resources:

1. Adobe Photoshop Official Tutorials – Digital sketching & rendering techniques.
2. McNeel's Rhino 3D Documentation – Advanced CAD modeling tutorials.
3. Keyshot Learning Academy – Rendering techniques, material applications.
4. Gumroad & ArtStation Courses – Advanced visualization techniques for industrial design.

Youtube Channels:

- Piximperfect – Photoshop tutorials.
- Sketch-It! Leandro Trovati – Product sketching techniques.
- Sketch A Day – Daily digital sketching exercises.
- FZDSchool – Concept visualization and rendering

