

**FACULTY OF COMPUTER APPLICATIONS**  
**B.Sc.(IT) ( Animation, Vfx and Game Design)**

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- **Sem** : 4
- **Subject Code** : 05BA0404
- **Subject** : Lighting, Rendering and Compositing
  
- **Course Objectives** : Students will be able:
  1. Understand the principles of digital lighting and how it influences mood and storytelling.
  2. Learn the Arnold Renderer's lighting and rendering techniques inside Maya.
  3. Apply realistic lighting setups for both interior and exterior environments.
  4. Use render passes and AOVs for efficient compositing.
  5. Composite final outputs using Adobe Photoshop to enhance visual quality.
  
- **Prerequisites** : Basic understanding of 3D modeling in Maya.

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## PRACTICALS

<b>Unit No</b>	<b>Topics Covered</b>	<b>No of lectures required</b>
<b>1</b>	Introduction to Lighting <ul style="list-style-type: none"> <li>▪ Key, fill, rim light concepts, 3-point lighting.</li> <li>▪ Maya Lighting Tools – Directional, point, area, and spot lights.</li> <li>▪ Understanding Shadows – Hard/soft shadows, ray tracing, shadow linking.</li> <li>▪ Arnold Lights – Arnold Area Light, Mesh Light, Skydome Light, and Photometric Lights.</li> <li>▪ HDRI Lighting – Using image-based lighting for natural scenes.</li> </ul>	<b>30</b>
<b>2</b>	Arnold Rendering Basics <ul style="list-style-type: none"> <li>▪ Render settings, sample tuning, camera settings.</li> <li>▪ Material and Shader Setup – Using AI Standard Surface for realistic textures.</li> <li>▪ Render Optimization – Noise reduction, adaptive sampling, render time management.</li> <li>▪ Depth of Field and Motion Blur – Adding cinematic effects through camera and render settings.</li> <li>▪ AOVs and Render Passes – Setting up passes (diffuse, specular, shadows, Z-depth).</li> </ul>	<b>30</b>

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<b>3</b>	<p>Compositing Introduction</p> <ul style="list-style-type: none"> <li>▪ Understanding layers and blending in Photoshop.</li> <li>▪ Using Render Passes – Combining and enhancing AOVs for final output.</li> <li>▪ Color Grading – Adjusting levels, curves, hue/saturation to set mood.</li> <li>▪ Lens Effects – Adding bloom, glare, glow, chromatic aberration.</li> <li>▪ Matte Painting Basics – Integrating 2D elements with rendered scenes.</li> </ul>	<b>30</b>
<b>4</b>	<p>Lighting for Different Scenarios</p> <ul style="list-style-type: none"> <li>▪ Daylight, night, fantasy, sci-fi, product lighting.</li> <li>▪ Look Development – Combining lighting and shaders for visual consistency.</li> <li>▪ Project Workflow – From lighting setup to compositing final image.</li> <li>▪ Final Project – Create a fully lit and rendered 3D scene with final composite.</li> <li>▪ Portfolio Output – Preparing breakdowns and presentation sheets.</li> </ul>	<b>30</b>

**Course Outcomes:**

1. Students will create well-lit 3D environments using Maya and Arnold.
2. Students will apply realistic shading and rendering techniques.
3. Students will utilize render passes and AOVs for compositing workflows.
4. Students will composite final renders using Photoshop for a professional look.

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- Students will present a final lighting and compositing breakdown suitable for portfolio and industry.

**Course Outcomes – Program Outcomes Mapping Table:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3
CO1	M	H	-	-	L	-	H	-	L	-	M
CO2	-	-	L	M	-	H	-	L	H	-	-
CO3	-	M	H	-	-	-	L	H	-	L	M
CO4	L	-	-	H	-	M	-	-	M	H	-
CO5	H	-	M	-	H	-	M	-	-	L	L

**Text Book:**

- Digital Lighting and Rendering by Jeremy Birn 2013 by New Riders
- Maya 2024 – A Comprehensive Guide 2024 by CAD/CIM Technologies

**Reference Books:**

- Lighting for Animation by Jasmine Katatikarn & Michael Tanzillo 2016 by Routledge
- The Art of 3D Computer Animation and Effects by Isaac Kerlow 2009 by Wiley

**Web Reference:**

- <https://help.autodesk.com>
- <https://docs.arnoldrenderer.com>
- YouTube: Arvid Schneider, FlippedNormals, Academic Phoenix Plus

**App Reference:**

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1. Arnold Renderer – for realistic output
2. Adobe Photoshop – for render compositing

**Syllabus Coverage from text /reference book & web/app reference:**

Unit	Chapter Numbers
1	Book 1 – Ch. 1–3 (Lighting Concepts and Setup)
2	Book 1 – Ch. 4–6 (Arnold Rendering & AOVs)
3	Photoshop Tutorials + AOV Compositing Techniques
4	Project-based tutorials from Book 2 + Online Compositing References