

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

- **Sem** : 4
- **Subject Code** : 05BA0406
- **Subject** : Game World Building

- **Course Objectives** : Students will be able:
 1. Understand the fundamentals of game environment design and world building.
 2. Learn how to create modular assets, terrains, and props using Maya and ZBrush.
 3. Generate realistic landscapes and heightmaps using Gaea.
 4. Develop textured and optimized game environments ready for engine integration.
 5. Compose immersive game worlds for use in level design and storytelling.

- **Prerequisites** : Basic knowledge of 3D modeling and digital sculpting.

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PRACTICALS

Unit No	Topics Covered	No of lectures required
1	<p>Introduction to World Building</p> <ul style="list-style-type: none"> ▪ Concepts, workflows, and references. ▪ Environment Planning – Blockouts, level layout, asset lists. ▪ Modeling in Maya – Creating modular building kits (walls, pillars, arches). ▪ UV Mapping – Tiling and optimization for game assets. ▪ Exporting Assets – FBX settings and naming conventions. ▪ Sculpting Details in ZBrush – Creating organic forms (rocks, cliffs, tree bark). ▪ ZBrush to Maya Workflow – Decimation, normal/displacement maps. ▪ Tileable Textures – Sculpting and baking seamless texture maps. ▪ Terrain Sculpting in Gaea – Working with heightfields, nodes, and erosion. ▪ Exporting Heightmaps – Integration with Maya or game engines. 	30

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2	<p>Texturing Environments</p> <ul style="list-style-type: none"> ▪ Applying baked maps, using Substance materials. ▪ Vertex Painting & Blending – For terrain detail and realism. ▪ Level Composition – Assembling scenes and organizing environments. ▪ Lighting Fundamentals – Adding atmosphere and depth to game worlds. ▪ Camera Setup – Creating cinematic environment walkthroughs. ▪ Optimization Techniques – LODs, instancing, and baking details. ▪ Scene Export for Game Engine – Preparing for Unreal/Unity integration. ▪ Post-processing in Photoshop – Matte paint overs, skyboxes, and effects. ▪ Final Environment Project – Full game level mockup with assets and terrain. ▪ Portfolio Presentation – Screenshots, flythroughs, and asset breakdowns. 	30
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Course Outcomes:

1. Students will design and build modular 3D environments using industry-standard tools.
2. Students will sculpt detailed props and natural assets using ZBrush.
3. Students will generate and refine terrains using Gaea for game integration.
4. Students will texture, light, and compose immersive game environments.
5. Students will produce a polished, portfolio-ready world building project.

Course Outcomes – Program Outcomes Mapping Table:

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

Text Book:

1. Game Environment Art: Production Pipeline and Portfolio Creation by Michael McKinley 2024 by CRC Press

Reference Books:

1. Digital Modeling by William Vaughan 2011 by Pearson
2. Beginner’s Guide to ZBrush 2017 by 3DTotal Publishing

Web Reference:

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1. <https://docs.autodesk.com/maya>
2. <https://docs.pixologic.com>

App Reference:

1. ArtStation – For exploring professional environment art and game worlds.
2. Pinterest – For gathering visual references and environment design inspiration.

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

Unit	Chapter Numbers
1	Book – Ch. 1–3 (Environment Planning, Modular Design, UVs)
2	Book – Ch. 4–5 (ZBrush Workflow, Terrain Sculpting)