COURSE TITLE	**TEXTURING LIGITING AND RENDERING**
COURSE CODE	**05MA0204**
COURSE CREDITS	**4**

Objective:

1 Understand the principles of realistic texturing using Substance Painter.
2 Develop skills in creating and applying materials, textures, and UV mapping in Maya.
3 Understand the principles of digital lighting and how it influences mood and storytelling.
4 Learn the Arnold Renderer's lighting and rendering techniques inside Maya.
5 Apply realistic lighting setups for both interior and exterior environments.

Course Outcomes: After completion of this course, student will be able to:

1 Students will be able to demonstrate an understanding of texturing principles and techniques using Substance Painter.
2 Students will be able to create realistic materials and textures for 3D models.
3 Students will be able to apply textures and set up realistic lighting in Maya.
4 Students will utilize render passes and AOVs for compositing workflows.
5 Students will composite final renders using Photoshop for a professional look.

Pre-requisite of course: Basic knowledge of 3D modeling concepts and familiarity with Maya interface is helpful.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
0	0	8	0	0	0	50	50

Contents : Unit	Topics	Contact Hours
Total Hours		

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**UNIT 1** Introduction to Substance Painter and Maya Integration Introduction to Substance Painter Interface – Understanding the user interface, navigation, and basic tools. Introduction to Maya Interface - Understanding the user interface, navigation, and basic tools. UV Mapping Fundamentals – Understanding UV mapping principles and techniques in Maya. Importing and Exporting Models – Importing models from Maya into Substance Painter and exporting textures back to Maya. Setting up Projects – Configuring project settings in both Substance Painter and Maya for optimal workflow.	30
2	**UNIT 2** Texturing with Substance Painter Material Creation – Creating realistic materials using Substance Painter's material editor. Painting Techniques – Using brushes, layers, and masks to paint textures directly onto models. Smart Materials and Smart Masks – Utilizing pre-made smart materials and creating custom smart masks. Procedural Texturing – Applying procedural textures and generators to create complex surface details. Baking Maps – Baking maps (Normal, Ambient Occlusion, Curvature, etc.) from high-poly to low-poly models.	30
3	**UNIT 3** Applying Textures in Maya – Connecting textures created in Substance Painter to Maya materials. Understanding Maya Shaders – Working with Maya's shader network to create realistic materials. Lighting Techniques in Maya – Setting up realistic lighting scenarios using Maya's lighting tools (Arnold Renderer). Rendering Fundamentals – Understanding rendering settings and options in Maya (Arnold Renderer). Optimizing Scenes – Optimizing models, textures, and lighting for efficient rendering.	30
4	**UNIT 4** Arnold Rendering Basics – Render settings, sample tuning, camera settings. Material and Shader Setup – Using AI Standard Surface for realistic textures. Render Optimization – Noise reduction, adaptive sampling, render time management. Depth of Field and Motion Blur – Adding cinematic effects through camera and render settings. AOVs and Render Passes – Setting up passes (diffuse, specular, shadows, Z-depth).	30
Total Hours		**120**

Textbook :

1 The PBR Guide – A Handbook for Physically Based Rendering, Wes McDermott (Allegorithmic), Allegorithmic, 2014

References:

1 Mastering Maya 2020, Mastering Maya 2020, Todd Palamar, Sybex (an imprint of Wiley), 2020

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References:

2 Substance Painter 2018 – A Practical Guide, Substance Painter 2018 – A Practical Guide, Enrico Tammekänd, Independently Published, 2018

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
10.00	20.00	25.00	25.00	10.00	10.00

Instructional Method:

1 Boardwork, Practical

Supplementary Resources:

1 https://docs.substance3d.com/spdoc/
2 https://help.autodesk.com/view/MAYAUL/2023/ENU/
3 https://area.autodesk.com/learn/courses/maya-rendering/
4 https://www.arnoldrenderer.com/learn/arnold-for-maya/
5 https://substance3d.adobe.com/documentation/spdoc/baking-mesh-maps-188973824.html
6 https://www.adobe.com/learn/substance-3d?learnIn=1

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