

COURSE TITLE	3D MODELLING
COURSE CODE	05BA0201
COURSE CREDITS	4

Objective:

- 1 To introduce students to the fundamental concepts of 3D modeling, texturing, and animation using Autodesk Maya
- 2 To develop students' skills in creating 3D assets for various applications, including animation, visual effects, and games
- 3 To familiarize students with the Maya interface, tools, and workflows
- 4 To foster creative problem-solving and artistic expression within a 3D environment
- 5 To prepare students for more advanced studies in 3D animation and visual effects

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

- 1 Students will be able to navigate and utilize the Autodesk Maya interface effectively.
- 2 Students will be able to create 3D models using a variety of polygon and NURBS modeling techniques.
- 3 Students will be able to apply textures and materials to 3D objects to create realistic surfaces
- 4 Students will be able to create basic animations using keyframing and the Graph Editor.
- 5 Students will be able to integrate various 3D elements to create a simple scene.

Pre-requisite of course:Familiarity with operating systems

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							

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Introduction to Autodesk Maya Introduction to 3D Graphics – Overview of 3D concepts, terminology, and applications, Maya Interface and Navigation – Understanding the Maya workspace, panels, and menus, Basic Object Manipulation – Transforming objects (translation, rotation, scaling), Introduction to Polygon Modelling – Creating and editing basic polygon primitives, Working with Attributes – Understanding and modifying object attributes	30
2	3D Modeling Techniques Polygon Modeling Tools – Extrude, Bevel, Bridge, and other essential modeling tools, Working with Edges, Faces, and Vertices – Advanced selection and manipulation techniques, Creating Complex Shapes – Modeling organic and hard-surface objects, , Introduction to NURBS Modeling – Creating curves and surfaces using NURBS, Combining Polygon and NURBS – Utilizing different modeling techniques for specific tasks	30
3	Texturing and Materials Introduction to Materials – Understanding different material types (Lambert, Blinn, Phong), Applying Textures – Mapping 2D images onto 3D objects, UV Mapping – Creating and editing UV layouts for optimal texture application, Working with Hyper shade – Creating and customizing materials using the Hyper shade editor, Introduction to Lighting – Adding and adjusting lights to create realistic scenes	30
4	Introduction to Animation Animation Principles – Overview of key animation principles (timing, spacing, anticipation), Keyframe Animation – Setting keyframes and creating basic animations, Working with the Timeline – Editing and refining animation timing, Graph Editor – Understanding and using the Graph Editor to control animation curves, Simple Character Animation – Animating a basic character rig	30
Total Hours		120

Textbook :

- 1 Mastering Autodesk Maya 2016: Autodesk Official Press, Palamar and Eric Keller, Sybex, 2015
- 2 Introducing Autodesk Maya, Dariush Derakhshani, CRC Press (an imprint of Taylor & Francis), 2024

References:

- 1 The Art of Maya: An Introduction to 3D Computer Graphics, The Art of Maya: An Introduction to 3D Computer Graphics, Alias Learning Tools , Sybex, 2003
- 2 Character Animation Fundamentals: 2D Skills for 3D Artists, Character Animation Fundamentals: 2D Skills for 3D Artists, Victoria Arlen , Focal Press, 2011

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
20.00	30.00	25.00	15.00	10.00	0.00

Instructional Method:

- 1 Practical

Supplementary Resources:

- 1 <https://www.autodesk.com/maya>
- 2 <https://cgcookie.com/>
- 3 <https://www.coursera.org/search?query=3d%20modeling>
- 4 <https://www.cgtrader.com/3d-models>
- 5 <https://www.skillshare.com/en/search?query=3d+modeling&searchMethod=naturalLang>
- 6 <https://sketchfab.com/features/free-3d-models>
- 7 <https://free3d.com/>
- 8 <https://www.adobe.com/products/substance3d/assets.html>
- 9 <https://www.freepik.com/3d-models>
- 10 <https://www.turbosquid.com/>