



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering Syllabus

Subject Code : 3174904

Subject Name : 3D ANIMATION

WEF Academic Year :	2023-24
Semester :	7 th
Category of the Course :	Professional Elective -V

Prerequisite :	NA
Rationale :	To enable students to create environments, characters and objects that appear more realistic than 2D animation.

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Practical		
				ESE (E)	PA(M)	ESE (V)	PA (I)	
3	0	2	4	70	30	20	30	150

Course Content:

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Unit 1: INTRODUCTION TO 3D ANIMATION Introduction to fundamental 3D theories and principles of computer modeling and animation, Some Techniques of Animation – Animation on the WEB, 3D Animation Special Effects Creating Animation, Modeling methods, Modeling with Primitives Planning your Model Deforming Lattices, Wire or Cluster. Extrusion, Object duplication Pivots and CV Surfaces The Production Process, Complex Model Hierarchy. Complexities over various Modeling Techniques, Purpose and Modeler Dependency Hardware and Software Considerations.	10	18%
2	Unit 2: 3D Animation & its Concepts Basic Animation – Animation Types – Key frame Animation – Understanding Animation workflow, Animation Techniques – Non – Linear and Character Animation – Posing, Timing and Refining – Working with Poses, 3D Animation & its Concepts – Types of 3D Animation – Skeleton & Kinetic 3D Animation – Texturing & Lighting of 3D Animation – 3D Camera Tracking – Applications & Software of 3D Animation.	8	17%



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering Syllabus

Subject Code : 3174904

Subject Name : 3D ANIMATION

3	Unit 3: Motion Caption, Formats, Methods, Usages , Expression ,Motion Capture Software's – Script Animation Usage – Different Language of Script Animation Among the Software.	5	15%
4	Unit 4: Anatomy: Biped Vs. Quadruped, Biped, Quadruped, Walking Cycle, Running Cycle, Facial Rig and Morpher Facial Language, LipSync, Eyes and Focal Points, Sequence Editing, Phonetics. Importance	6	15%
5	Unit 5: Applied Animation,3D Animation for Film and Television, Animation for Video Games, Animation for Other Applications, Motion Capture with Kinect, Motion Capture for Animation, Sequence of Movements, Blender Integration, Skeleton, Skinning and Setup, Interaction Between Skeleton and Geometry, Mesh Interpolation, Animation Weights, Acting, Body Language, Poses, Sequence Editing, Cameras and Plans, The Camera and the Environment, Composition of the Shot and the Characters, Finishes	8	20%
6	Unit 6: Concept Development –Story Developing –Audio & Video – Color Model – Device Independent Color Model – Gamma and Gamma Correction - Production Budgets 3D Animated Movies.	5	15%
Total			100

Reference Book:

1. The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion, and Internet Animators by Richard Williams
2. Cartoon Animation (How to Draw and Paint series) by Preston Blair. The Illusion of Life:
3. Disney Animation by Frank Thomas, Ollie Johnston (Contributor), Collie Johnston.
4. Mastering 3D Animation , by Peter Ratner (Author) Autodesk Maya, 2011

No	Course Outcomes	RBT Level*
CO1	Explain the fundamental concepts and principles of 3D animation and modeling techniques.	UN
CO2	Apply animation techniques including keyframe, non-linear, and character animation using software tools.	AP
CO3	Analyze motion capture methods and scripting languages used in 3D animation.	AN
CO4	Demonstrate character rigging, lip-syncing, and sequence editing for biped and quadruped models.	AP
CO5	Design and develop 3D animations for games, films, and multimedia applications using software like Blender.	CR
CO6	Develop production-ready animated sequences with appropriate storyboarding, audio/video, and camera planning.	CR



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering Syllabus

Subject Code : 3174904

Subject Name : 3D ANIMATION

PRACTICAL LIST:

1. Create any Model some objects such as chairs, tables, fruits, utensils
2. Create any Model instruments, tools
3. Create any Model of Cars or Bike
4. Create any model of the male or female character.
5. Create any Model of any animal.
6. Create any Model of any birds, fishes, and worms.
7. Apply basic material and shader types & Procedurals textures.
8. Unwrap the models of objects and characters using various projection maps.
9. Apply texture on various objects and characters.
10. Create a natural outdoor or indoor scene.
11. Create Opacity, Smoothness, Secularity, and color maps, Transparency, Reflection
12. Render a frame and video of indoor and outdoor scenes.
13. Render a video of indoor scenes.
14. Render a photorealistic output of an interior scene
15. Animate day and night scene of a street with the help of lighting.
16. Make an animation of a character walking in the street he picks up some object and throws it.
17. Make various expressions of models and use them for blend shapes.
18. Make different kinds of biped walk (Happy, Sad, Attitude and Tiptop) 5. Mechanical rig and Vehicle rig.
19. Create a hair system on a male or female model.
20. Create an animation of a non-living object.

* * * * *