SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

Year	Semester	Paper Code	Subject	Hrs. per Week	Credits	IA	ES	Total
First Year	I	MM1	WORKING WITH 3D	4	3	25	75	100
	I	MM -P	WORKING WITH 3D - LAB	2	2		50	50
	II	MM 2	BASICS OF 3D ANIMATION	4	3	25	75	100
	II	MM 2-P	BASICS OF 3D ANIMATION - LAB	2	2		50	50
Second Year	III	MM 3	CHARACTER ANIMATION	4	3	25	75	100
	III	MM 3-P	CHARACTER ANIMATION - LAB	2	2		50	50
	IV	MM 4	ADVANCED CHARACTER ANIMATION	4	3	25	75	100
	IV	MM 4-P	ADVANCED CHARACTER ANIMATION - LAB	2	2		50	50
	IV	MM 5	FACIAL & BLEND MODES	4	3	25	75	100
	IV	MM 5-P	FACIAL & BLEND MODES - LAB	2	2		50	50
Third	V	MM 6	LIVE INTEGRATION	4	3	25	75	100
	V	MM 6-P	LIVE INTEGRATION - LAB	2	2		50	50
	V	MM 7	VISUAL EFFECTS	4	3	25	75	100
	V	MM 7 - P	VISUAL EFFECTS - LAB	2	2		50	50

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

WORKING WITH 3D	
Semester : **I**	**Paper : I**
Category :**THEORY**	

Learning Outcomes: At the end of the course, the student will able to

➢ Identify 3D software and hardware

➢ Equip with the basic knowledge of Autodesk Maya

➢ Develop the skill of overall 3D workflow

➢ getting sufficient knowledge for doing simple 3D project

UNIT – I

MAYA: Introduction to MAYA - The Maya interface – software and hardware - Tool bar – Menubar- layers, Shortcut Keys, Knowing the Primitive objects in Maya, Understanding About ViewPorts, Channel Box, Hot Box, Channel Attributes, Outline Editor.

UNIT – II

ANIMATION: Animation in MAYA - Principles of animation (squash and stretch, timing)... DoingObject animation & Understanding the Behavior of Shapes of Objects, Making play blasts-Workingwith Animation Curves - Graph Editor – time line- Shortcuts, Camera Animation, SettingResolution Gates.

RIGGING: Knowing Deformers and there functionality (Lattice, Cluster, Wire, Jiggle… & NonLinear Deformers), Knowing Constraints (Point, Orient, Scale, Parent, Pole Vector, Aim…),Introduction to Joints – Understanding difference between Local Axis and World Axis for Joints

UNIT – III

MODELLING: Introduction to modelling - Primitive objects - NURBS and polygon modelling toolsto Organic and Industrial designs – Editing Nurbs& Polygons, Learning Menus in Surfaces andPolygons Tabs, Shortcut.

TEXTURING: Introduction to Materials: – Understanding the Materials & Behavior of material,Understanding UV Texture Editor, Applying Single Color to object, Hyper shade – Understanding

different types of Maps – Understanding UV mapping - UV manipulation - editing texture inPhotoshop – UV snap shot - Applying materials and textures to models and props – Shortcuts.

UNIT – IV

LIGHTING: Understanding Color Theory, Introduction to lighting – importance of lightnganimation - Basic Lighting Concepts – types of lights – Change the color of the light – lightattributes – rendering - Shortcuts

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

RENDERING: Introduction to rendering, Knowing Renderers – software Rendering, HardwareRendering, Vector Rendering, Mental Ray Rendering, Selecting a Render Type, InteractivePhotorealistic Rendering (IPR), Batch Rendering, Working with the Options in Render setting.

UNIT – V

DYNAMICS: Introduction to Particles, Crating Emitter, Knowing Different types of Particle,particle object, knowing about Hardware rendering Particles & Software Rendering Particles,Goals, Particle collisions, Emit from Object, Goals, Understanding the Physics of Dynamics,Knowing Fields, Understanding Dynamics Constrains, Knowing Soft Body and Rigged Bodies,Emitting From Object, Understanding Fields, Setting Particle Life Span, Setting Color forParticles, Understanding Basic Particle Attributes.

Reference:

1. Maya 2008 Character Modeling and Animation. Author: Tereza Flaxman
2. The Animator's Survival Kit (Author: Richard Williams)

Suggested Co-Curricular Activities:

*Book Reading
*Student Seminars, Debates
*Quiz Programmes
*Assignments
*Co-operative learning
*Individual / Group Field Studies
*Group Discussions on problems relating to topics covered by syllabus
*Creating multiple tasks with own creativity

Topics covered in syllabus

* Maya interface
* Principles of animation
* Introduction to modelling
*Understanding software Rendering, HardwareRendering

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

WORKING WITH 3D - LAB	
Semester : **I**	**Paper : I**
Category :**PRACTICAL**	

MODELING

- Maya toolbar, 3-D workspace, Primitive objects (cubes, cylinders, spheres, planes, and tours)

Modeling with NURBS

- Creating NURBS curves & Understanding CV Curve & EP Curve. NURBS basics (control vertices, curves (Isoparms), Hulls & Patches), Tools to Edit Curve. Creating Surfaces with Curves. Knowing Options Revolve, Loft, Extude, Biral (Biral 1, Biral 2, Biral3).

Editing NURBS Surfaces using Edit Nurbs Menu

- Trimming
- Attach & Detach Surfaces.
- Booleans
- Insert Isoparms
- Stitching
- The Sculpt Geometry Tool

Modeling with NURBS Surfaces

- Objects Modeling with Loft, Revolve, Extrude & Brail.
- Creating Bottles, Lids, bulbs, fans, pots, glass, etc.,

Modeling with polygons

- Polygon Basics, about polygons, Create and reshape polygons, Knowing, Mesh Menu.
- Edit Polygons Menu.
- Combining, separating, and splitting, Booleans, Create Polygon, insert Edge Loop, Make Hole, Fill Hole, Extrude, Bridge, Slide edge Tool, Sculpt Geometry Tool etc,.
- Reflections, rotations, and scaling (using animation software tools)
- Splitting polygons
- Modeling Props & sets & Small Vehicle, Objects.

TEXTURING

- Surfacing: Enhancing Form through Texture
- Use the UV Texture Editor to visualize how the UV texture coordinates from a three-dimensional
- model relate to an assigned two-dimensional texture map.
- V mapping & UV manipulation.
- Hyper shade & Hyper shade Operations to apply wood, rock, ice, and more.
- Applying texture to Basic Primitives.
- Materials and Textures.

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

BASICS OF 3D ANIMATION	
Semester : **II**	**Paper : II**
Category : **THEORY**	

Learning Outcomes: At the end of the course, the student will able to

➢ Identify basic concept of Layout Design

➢ Equip with the knowledge of Basic animation

➢ Develop the skill of animating objects in Maya

➢ Analyze the difference between linear Animation and Non linear Animation

UNIT – I

Layout Design – working on principals of animation – Camera settings in Maya - Setting up Scene for rendering. & Rendering concept

UNIT – II

Basic animation – Animation types – Key frame Animation – understanding Animation Work Flow

UNIT - III

Nonlinear Animation: Introduction to Nonlinear Animation – Understanding Trax editor – Creating poses – working with poses - Creating clips – working with clips – Modifying clips – Blending clips

UNIT - IV

Working on: squash and stretch and timing, Staging and exaggeration, Follow through understand the fluid movement of cloth and hair, Mechanics. Effect of forces and weight, working on acting basics. Mastering emotions

UNIT - V

Rendering – Rendering setup – render view window – Reflections and Refractions - using cameras and motion blur – batch rendering – render layers

Reference:

1. “Disney Animation: The Illusion of Life”, Ollie Johnson & Frank Thomas (1995)

2. “The Animator’s Survival Kit”. Richard Williams, Faber & Faber, (2002)

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

Suggested Co-Curricular Activities:

*Book Reading
*Student Seminars, Debates
*Quiz Programmes
*Assignments
*Co-operative learning
*Individual / Group Field Studies
*Group Discussions on problems relating to topics covered by syllabus
*Creating multiple tasks with own creativity

Topics covered in syllabus

*Importance of 3D Animation
* Understanding Animation Work Flow
* understand the fluid movement of cloth and hair
* Rendering setup – Render view window

BASICS OF 3D ANIMATION - LAB	
Semester : **II**	**Paper : II**
Category : **PRACTICAL**	

Camera settings in Maya - Setting up Scene for rendering. & Rendering concept

Basic animation – Animation types – Key frame Animation – understanding Animation Work Flow Nonlinear Animation: Introduction to Nonlinear Animation – Understanding Trax editor – Creating poses – working with poses - Creating clips – working with clips – Modifying clips – Blending clips

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

CHARACTER ANIMATION	
Semester : **III**	**Paper : III**
Category : **THEORY**	

Learning Outcomes: At the end of the course, the student will able to

➢ Identify basic key frame animation

➢ Equip with the knowledge of basic human anatomy

➢ Develop the skill of the graphic nature of characters

➢ Analyze the difference between weight and balance

UNIT – I

Working on: squash and stretch and timing, Staging and exaggeration, Follow through understand the fluid movement of cloth and hair, Mechanics. Effect of forces and weight, working on acting basics. Key to key animation

UNIT – II

basic human anatomy – the spine – the rib cage – the pelvic girdle - the skull - the shoulders – joints - moving in arcs - designing a basic human character.

UNIT - III

complexity – the graphic nature of characters– strong silhouettes – weight and balance - gravity balance

UNIT - IV

planning a scene - animating your characters - working out the key positions - in-betweening the key positions.

UNIT - V

Timing - anticipation - overshoot - follow-through and overlapping action with an animated character

Reference:

1. “Disney Animation: The Illusion of Life”, Ollie Johnson & Frank Thomas (1995)

2. “The Animator’s Survival Kit”. Richard Williams, Faber & Faber, (2002)

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

Suggested Co-Curricular Activities:

*Book Reading
*Student Seminars, Debates
*Quiz Programmes
*Assignments
*Co-operative learning
*Individual / Group Field Studies
*Group Discussions on problems relating to topics covered by syllabus
*Creating multiple tasks with own creativity

Topics covered in syllabus

* working on acting basics
* Introduction to graphic nature of characters
*Difference between Key poses and in betweens
*Principles of animation

CHARACTER ANIMATION	
Semester : **III**	**Paper : III**
Category : **PRACTICAL**	

- Camera setting for layout
- Camera animation
- Squash and Stretch
- Bouncing Ball
- Understanding Dope Sheet
- Working with Trax Editor
- Throwing an axe
- Animating flying text
- Path animation
- Basic relationships: Constraints
- Basic relationships: Set – Driven key
- Working with full body IK animation rig
- Layer wise Rendering
- Batch rendering

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

ADVANCED CHARACTER ANIMATION	
Semester : **IV**	**Paper : IV**
Category : **THEORY**	

Learning Outcomes: At the end of the course, the student will able to

➢ Identify Animation process

➢ Equip with the knowledge of animation principles

➢ Develop the skill of Intermediate animation and timing techniques

➢ Analyze the difference between Cartoon animation – realistic animation.

UNIT – I

Preparing to animate – Reference sources – Video cameras – DVDs & video tapes – illustrated books – paper and pencil – Sound recordings

UNIT – II

Animation process – posing – timing – refining – Animating a character for jum – The relax pose – Anticipation pose – Compression – Moving hold – uncoil pose – top pose – contact pose – impact pose – stand 01 stand 02 – staging and posing – establishing timing

UNIT - III

Graph editor – walk cycle – Frame by frame posing – Extreme keys - in-betweens – break down keys – working on animation principals

UNIT - IV

Intermediat animation and timing techniques – Building stronger poses and timing – review of animation curve editing tools and techniques – working with motion curves, keys and tangents - working on graph editor, trax editor and dope sheet

UNIT - V

Introduction to motion capture – working on motion capture files – Cartoon animation – snappy animation – realistic animation.

Reference:

1. Auto desk maya 2011 sybex ISBN:978-81-265-2711-3

2. The Art of Maya: An Introduction to 3D Computer Graphics (Paperback) Autodesk Maya Press (ISBN: 978-1897177471)

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

Suggested Co-Curricular Activities:

*Book Reading
*Student Seminars, Debates
*Quiz Programmes
*Assignments
*Co-operative learning
*Individual / Group Field Studies
*Group Discussions on problems relating to topics covered by syllabus
*Creating multiple tasks with own creativity

Topics covered in syllabus

* Posing the character key frame timing and refining
* Introduction to working with motion curves
*Difference between graph editor and trax editor
* Introduction to motion capture

ADVANCED CHARACTER ANIMATION	
Semester : **IV**	**Paper : IV**
Category : **PRACTICAL**	

- Layout scene setup and camera animation
- Walk cycle
- Run cycle
- White and Jump
- Two character interaction

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

FACIAL & BLEND MODES	
Semester : **IV**	**Paper : V**
Category : **THEORY**	

Learning Outcomes: At the end of the course, the student will able to

➢ Identify basic Character rig analogy

➢ Equip with the knowledge of facial Rigging for Key Frame Animation

➢ Develop the skill of blend modes

➢ Synchronization Time and Artistic Freedom

UNIT – I

INTRODUCTION: Introduction to Facial Animation–Recalling principals of Animation – software and hardware –Character rig analogy – application domain - Shortcut Keys, - Facial rigging process – Morphology –Behaviors – Facial rigging for key frame animation.

UNIT – II

FACIAL RIGGING: Hierarchies, Transformations, Scale and Pose. - Naming Conventions - Facial Rigging for Key Frame Animation: Techniques - Facial Rig Mechanics – Facial Rig Controls - Facial Rigging for Key Frame Animation.

General Anatomy - Eyebrows - Eyelids - Eyeballs and Pupils - Nose - Ears - Cheeks - Jaw - Lips - Tongue.

UNIT – III

FACIAL ANIMATION: Facial Animation Control–Goals and Objectives - Methodology – Studying the Anatomy of the Human Head and Face - Development of an Expression Taxonomy - Development of a Polygon Model Mesh - Collection of Reference Data - Superposition of Overlapping Blend shapes - Demonstration of the Developed Model With Several Facial Animations.

UNIT – IV

ACTIONS: Implemented Muscle Actions – Inner Brow Raiser (both sides) - Outer Brow Raiser (both sides) – Brow Lowerer (both sides) – Eyes Closed (both sides) – Nose Winkler – Upper Lip Raiser (both sides) - Lip Corner Puller (both sides) - Lip Stretcher (both sides) - Lip Corner Depressor (both sides) - Chin Raiser - Lip Tightener - Lip Puckerer.

UNIT – V

LIP SYNC: Introduction to lip sync - The Lip Sync Process - Determine the Speech Pattern - Analyze the Audible Dialog to Determine Phonemes - Use Timing Table to Set Frames - Getting the Finished Animation - Phoneme Dropping Guidelines - Synchronization Time and Artistic Freedom - Creating Data Structures - Collecting Information – Discussion – Conclusion.

Reference:

1. Auto desk maya 2011 sybex ISBN:978-81-265-2711-3

2. The Art of Maya: An Introduction to 3D Computer Graphics (Paperback) Autodesk Maya Press (ISBN: 978-1897177471)

Suggested Co-Curricular Activities:

*Book Reading
*Student Seminars, Debates
*Quiz Programmes
*Assignments
*Co-operative learning
*Individual / Group Field Studies
*Group Discussions on problems relating to topics covered by syllabus
*Creating multiple tasks with own creativity

Topics covered in syllabus

* Introduction to Facial Animation
* Introduction to Hierarchies, Transformations
* Demonstration of the Developed Model with Several Facial Animations.
* Phoneme Dropping Guidelines

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

FACIAL & BLEND MODES	
Semester : **IV**	**Paper : V**
Category : **PRACTICAL**	

1. 12 Principles of Animation
2. Understanding Maya Key frames & Frame Rates
3. Knowing the Importance of Spacing and timing.
4. Understanding Graph Editor & Tangents in Graph.
5. Understanding what is Rigging. Knowing Set Driven Keys.
6. Types of Rigging. Knowing Non Linear Deformers. Knowing Constraints.
7. Creating blend shapes for facial animation
8. Editing & Controlling the Graph for Animation. Knowing Animate Menu.
9. Difference between Normal Parent & Parent Constraint
10. Know the Importance of Group. Creating Controller's for the object.
11. Adding Attributes for the Controller.
12. Doing Exercises on Spacing and Timing.
13. Follow Through Animation.
14. Knowing Joints. Understand Local & World Orientation's. Knowing IK RP & SC Solver. Knowing Spine Solver.
15. Anticipation Actions for face expressions. Follow Through and Over Lapping Setting a Staging through Camera.
16. Working on ovals Working on mouth shapes and lip-sync

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

LIVE INTEGRATION	
Semester : **V**	**Paper : VI**
Category : **THEORY**	

Learning Outcomes: At the end of the course, the student will able to

➢ Identify 3D camera and live camera

➢ matching the perspective in a 3D animation program

➢ Develop the skill of camera calibration

➢ Analyze the difference between match move and roto scoping

UNIT – I

INTRODUCTION: Introduction to Autodesk Match mover–Interface and tools – Interaction with live cameras using in production - working on 3D camera and 2D camera–understanding camera formats – Knowing 3D camera and live camera – familiarizing in camera animation.

UNIT – II

2D AND 3D: Understanding visual effects pipe line - Understand the basic principles of match moving - matching the perspective in a 3D animation program - integrating 2D and 3D - Understand the core principles of photogrammetric - key concepts and procedures involved with 2D tracking - identify and correct problems with 2D tracking.

UNIT – III

CAMERAS: camera calibration - underlying mechanisms involved with calibration – Solve Cameras – working on 2D tracking - understand what a "good" calibration looks like and how to achieve it in a match moving program - Understand the core concepts of camera calibration –Understand the concepts and procedures used in automatic tracking - Working on automatic tracking.

UNIT – IV

TRACKING: working on cameras and lenses – film gate sizes and lens distortion – basic process of integrating the solution from a match moving program into a 3D scene - adjust the coordinate system - perform final checks of the match move - strategies for delivering scenes to downstream artists - how to fit a match moved camera to a 3D environment - how to adjust a coordinate system in a 3D animation program.

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

UNIT – V

INTEGRATING: using tracking markers - highly recommend to work on green screen - Understand the various aspects of a match mover's job- Match move blends techniques from animation and roto scoping - Demonstrate the integration.

Reference:

1. Auto desk maya 2011 sybex ISBN:978-81-265-2711-3

2. The Art of Maya: An Introduction to 3D Computer Graphics (Paperback) Autodesk Maya Press (ISBN: 978-1897177471)

3. Behind the Scenes with Geniuses of Visual and Special Effects

Suggested Co-Curricular Activities:

*Book Reading
*Student Seminars, Debates
*Quiz Programmes
*Assignments
*Co-operative learning
*Individual / Group Field Studies
*Group Discussions on problems relating to topics covered by syllabus
*Creating multiple tasks with own creativity

Topics covered in syllabus

* Introduction to Autodesk Match mover
* Understanding visual effects pipe line
* Underlying mechanisms involved with calibration
* coordinate system in a 3D animation program

LIVE INTEGRATION	
Semester : **V**	**Paper : VI**
Category : **PRACTICAL**	

1. working on cameras and lenses
2. film gate sizes and lens distortion
3. basic process of integrating
4. adjust the coordinate system
5. perform final checks of the match move
6. perform final checks of the match move

SUBJECT: MULTIMEDIA 3 YEAR COMPLETE SYLLABUS

VISUAL EFFECTS	
Semester : **V**	**Paper : VII**
Category : **THEORY**	

Learning Outcomes: At the end of the course, the student will able to

➢ Identify basic Drawing and Painting Motion Tracking

➢ Equip with the knowledge of color correction & keying

➢ Develop the skill of matte Clearing Unwanted Data

➢ Motion Tracking Workflow and Controls

UNIT – I

USER INTERFACE: Work Space Importing, Compositions, Views and Previews Layers and Properties &Animation Colors, Masks, Transparency and Keying Text, Drawing and Painting Motion Tracking, Effects and Animation Presets, Rendering and Exporting

UNIT – II

MOTION GRAPHICS: Image Based Motion Graphics, Video Based Motion Graphics .

UNIT – III

EFFECTS & TITLE EFFECTS: 3d Channel, Audio, Blur and Sharpen, Color Correction, Distort, Expression Control, Generator, Keying, Matte, Noise and Grain, Paint, Perspective, Noise and Grain, Paint, Perspective.

UNIT – IV

COLOR CORRECTION & KEYING: Auto Colors, Auto Contrast, Auto Levels, CC Color Offset, CC Toner Channel Mixer, Color Balance, Color Link, Colorama, Curves, Equalizers, Exposures, Levels, Levels (Individual Controls), Photo Filters, Shadows / Highlights, Tint, Tritone, CC Simple Wire Removal, Color Difference Key, Color Key, Color Range, Difference Matte, Extract, Inner /Outer Key, Key Light , Linear Color key, Luma Key, Spill Suppresser.

UNIT – V

MATCH MOVER: Motion tracking Overview, Motion Tracking Workflow and Controls, Tracking, Rot scoping, Wire Removal, Motion Tracking Options and Properties, Using Garbage Matte Clearing Unwanted Data, 3rd Party Plug-in

Reference:

1. behind the Scenes with Geniuses of Visual and Special Effects

Suggested Co-Curricular Activities:

*Book Reading
*Student Seminars, Debates
*Quiz Programmes
*Assignments
*Co-operative learning
*Individual / Group Field Studies
*Group Discussions on problems relating to topics covered by syllabus
*Creating multiple tasks with own creativity

Topics covered in syllabus

* Transparency and Keying Text
* Image Based Motion Graphics & Video Based Motion Graphics
* Auto Colors, Auto Contrast, Auto Levels
* Motion Tracking Options and Properties

INTERNSHIP	
Semester : **VI**	**Paper : VII**
Category : **PRACTICAL**	

For a period of two months, student will be attached to the media industry on an internship basis, with the objective to expose them to actual situations and day-day functioning of media industry. The interns will be exposed to the particular area of specialization. The faculty of the department in coordination will closely monitor progress of the interns with the guides in the media industry. A report and Viva-voce will complete the process of evaluation.