

Savitribai Phule Pune University
Faculty of Science & Technology



Curriculum

For

Bachelor of Vocational (Engg)

First Year Animation and Graphic Design
(Choice Based Credit System) (2019 Course)

(With Effect from Academic Year 2023-24)

B VOC Animation and Graphic Design for First Year

Structure of Semester-I

Sr. No	Course Code	Name of the Course	Teaching Scheme (Hours/Week)		Examination Scheme and Marks			Credits	Total Marks
			Theory	Pract	ISE	ESE	PR		
1	5.GV.01	Web Applications	3		50	50		3	100
2	5.GV.02	Communication Skill-I	3		50	50		3	100
3	5.GV.03	Graphic Design (Basic Sketching and Human Anatomy in Drawing)	3		50	50		3	100
4	5.GV.04	Illustration and Photo-Editing	3		50	50		3	100
5	5.VP.01	Web Applications -Lab		2	25		50	1.5	75
6	5.VP.02	Illustration and Photo-Editing -Lab		2	25		50	1.5	75
7		On-Job-Training (OJT)		18			200	15	200
							Total	30	750
		On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)							
	MES/Q3401	Sound Designer MES/Q3401	200 (Any one)						
	MES/Q0902	Camera Operator MES/Q0902							
	MES/Q3003	Script Researcher MES/Q3003							

Structure of Semester-II

General Education

		Theory							
Sr. No	Course Code	Name of the Course	Teaching Scheme (Hours/Week)		Examination Scheme and Marks			Credits	Total Marks
			Theory	Pract	ISE	ESE	PR		
1	5.GV.05	Pre-Production	3		50	50		3	100
2	5.GV.06	Audio Editing	3		50	50		3	100
3	5.GV.07	Video Editing	3		50	50		3	100
4	5.GV.08	Communication Skill- II	3		50	50		3	100
5	5.VP.03	Audio Editing-Lab		2	25		50	1.5	75
6	5.VP.04	Video Editing-Lab		2	25		50	1.5	75
7		On-Job-Training (OJT)		18			200	15	200
Total								30	750
		On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)							
	MES/Q3401	Sound Designer MES/Q3401	200 (Any one)						
	MES/Q0902	Camera Operator MES/Q0902							
	MES/Q3003	Script Researcher MES/Q3003							

B VOC Animation and Graphic Design for Second Year

Structure of Semester-I

Sr. No	Course Code	Name of the Course	Teaching Scheme (Hours/Week)		Examination Scheme and Marks			Credits	Total Marks		
			Theory	Pract	ISE	ESE	PR				
1	6.GV.01	Principles of Animation and Techniques of Animation	3		50	50		3	100		
2	6.GV.02	Basic of 3-D Modelling	3		50	50		3	100		
3	6.GV.03	Texture and Lighting	3		50	50		3	100		
4	6.GV.04	Communication Skills III	3		50	50		3	100		
5	6.VP.01	Digital Animation with Flash Lab		2	25		50	1.5	75		
6	6.VP.02	Maya Lab		2	25		50	1.5	75		
7		On-Job-Training (OJT)		18			200	15	200		
							Total	30	750		
		On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)									
	MES/Q3501	VFX Editor MES/Q3501	200 (Any one)								
	MES/Q3002	Script Writer MES/Q3002									
	MES/Q1302	Animation Director MES/Q1302									

Structure of Semester-II

General Education									
		Theory							
Sr. No	Course Code	Name of the Course	Teaching Scheme (Hours/Week)		Examination Scheme and Marks			Credits	Total Marks
			Theory	Pract	ISE	ESE	PR		
1	6.GV.05	3D Animation	3		50	50		3	100
2	6.GV.06	Introduction to 3 D Motion Graphics & VFX	3		50	50		3	100
3	6.GV.07	Introduction to Rendering	3		50	50		3	100
4	6.GV.08	Communication Skills IV	3		50	50		3	100
5	6.VP.03	3D Animation Lab		2	25		50	1.5	75
6	6.VP.04	3D Rendering Lab		2	25		50	1.5	75
7		On-Job-Training (OJT)		18			200	15	200
Total								30	750
		On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)							
	MES/Q3501	VFX Editor MES/Q3501	200 (Any one)						
	MES/Q3002	Script Writer MES/Q3002							
	MES/Q1302	Animation Director MES/Q1302							

B VOC Animation and Graphic Design for Third Year

Structure of Semester-I

Sr. No	Course Code	Name of the Course	Teaching Scheme (Hours/Week)		Examination Scheme and Marks			Credits	Total Marks
			Theory	Pract	ISE	ESE	PR		
1	7.GV.01	Digital Compositing	3		50	50		3	100
2	7.GV.02	3D Texturing	3		50	50		3	100
3	7.GV.03	Basic of Accounts-I	3		50	50		3	100
4	7.GV.04	Computer Graphics	3		50	50		3	100
5	7.VP.01	Digital Compositing Lab		2	25		50	1.5	75
6	7.VP.02	3D Texturing Lab		2	25		50	1.5	75
7		On-Job-Training (OJT)		18			200	15	200
Total								30	750
On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)									
	MES/Q3001	Script Editor MES/Q3001	200 (Any one)						
	MES/Q2801	Production MES/Q2801							
	MES/Q0901	Camera Operations MES/Q0901							

Structure of Semester-II

General Education

		Theory							
Sr. No	Course Code	Name of the Course	Teaching Scheme (Hours/Week)		Examination Scheme and Marks			Credits	Total Marks
			Theory	Pract	ISE	ESE	PR		
1	7.GV.05	Muscle System	3		50	50		3	100
2	7.GV.06	Rigging	3		50	50		3	100
3	7.GV.07	Advanced Modelling with Z- Brush	3		50	50		3	100
4	7.GV.08	Basics of Accounts-II	3		50	50		3	100
5	7.VP.03	Maya Muscle Lab		2	25		50	1.5	75
6	7.VP.04	Rigging with Maya Lab		2	25		50	1.5	75
7		On-Job-Training (OJT)		18			200	15	200
Total								30	750
		On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)							
	MES/Q3001	Script Editor MES/Q3001	200 (Any one)						
	MES/Q2801	Production MES/Q2801							
	MES/Q0901	Camera Operations MES/Q0901							

Detailed Curriculum

Level 5 (Semester I)

5.GV.01 Web Applications

Unit -1: Movie Editing Tools, Familiarization of interface components, importing pictures, Importing Audio and Video Files. Splitting and Joining Movie Clips, Adding Titles and publishing. Customizing and Embedding Multimedia components in Web Pages. Compatible Multimedia file formats for Web Pages. Embedding Audio file, Embedding Video file, Embedding Flash file. Web Scripting – Java Script, Java Script review.

Unit-2: Functions – user defined, String Object, Math Object, Array Object. Events. Case Studies. Work Integrated Learning IT – WA-II. Advanced Features of Web Design. Code view, Add-ins / Snippets and Page Transitions. Dynamic Web templates. SEO - Search Engine Optimization. Forms - Advanced. Publishing webpages or websites-I.

Reference Books:

1.[Internet & Web Development, Soma Das Gupta, Khanna Publishing House](#)

(5.GV.02) Communication Skill -I

Unit 1: Communication Process: The magic of effective communication; Building self-esteem and overcoming fears; Concept, nature and significance of communication process; Meaning, types and models of communication; Verbal and non-verbal communication; Linguistic and non-linguistic barriers to communication and reasons behind communication gap/ miscommunication.

Unit 2: Structural and Functional Grammar: Sentence structure, modifiers, connecting words and verbal; phrases and clauses; Case: subjective case, possessive case; objective case; Correct usage of nouns, pronouns and antecedents, adjectives, adverbs and articles.

Reference Books:

1.[Effective Communication Skills, Kulbhushan Kumar, Khanna Publishing House](#)

(5.GV.03) Graphic Design (Basic Sketching and Human Anatomy in Drawing)

UNIT I: Orientation into visual art form. The Basics of traditional 2D animation, Introduction to the skill required thereof, beginning life drawing, Use of simple shapes. How to draw sketches with the help of basic shapes Learning to draw lines, circles, ovals, scribbles, zigzag (random) patterns etc. Background elements, trees, mountains, clouds, water bodies, meadows, perspective drawing Lights and shadows day night scenes, layers (concept and implementation) layout design and staging. An intro on how to make drawings for animation, shapes and forms, about 2D and 3D drawings, Caricaturing-fundamentals, Exaggeration, Attitude, Silhouettes, Boundary breaking exercises and warm-ups.

UNIT II: HUMAN ANATOMY: Structure of man, proportion of body parts, drawing from basic form, Line of action, balance Rhythm, turnings, twisting, drawing plane surfaces, torso, face, eyes, nose, ears, mouth, hand and feet. FEMALE ANATOMY: Proportion and construction of female body, twisting of female body, chest, torso, face, parts of face, hands, hands in action, feet and gestures, curves, curls, rhythm and twist. CHILD ANATOMY: Understanding child's figure, proportion and construction of child body, face, chubbiness, hand, feet and gestures. ANIMAL ANATOMY: Animals from basic forms, understanding motion and grace of animals, turning animals to character, face, legs, tails, perspectives. CARTOON ANATOMY: Understanding cartoon characters, drawing from basic shapes, line of action, distortion of proportion, cartoon faces, eyes, mouths, hairs, nose, hands, feet, gestures and poses.

Reference Books:

1. [Internet and Web Technology, Soma Das Gupta, Khanna Publishing House](#)

(5.GV.04) Illustrations and Photo Editing

UNIT I:

Introduction to Adobe Illustrator: Introduction to Adobe Illustrator, work area and workspaces and tools. Opening files, importing art work, viewing art work, rulers and grids, drawing in Illustrator, drawing lines and shapes, pencil tool, pen tool, editing drawing, tracing, symbols, coloring, applying colors, swatches, adjusting color and color settings. Painting with Illustrator, fills, strokes, brushes, transparency, blending, gradient, meshes and color blending. Selecting, transformation, scaling, grouping, reshaping, cutting, blending of object, creating 3D object, text and typing, special effects, filters, shadows, glow, feathering graphic styles.

UNIT II:

Photoshop and its interface, Navigation and All tools, working with basic selections, advanced selections-1 (on the basis of channels, color range, extract, filter etc.), Exercises on selections, Quick Masks, Layer Mask, Vector Mask, Layers & Layer Blending Modes, play with Photoshop, Filter Gallery, Exercises, bring some object and try to make it in computer, Make your own cartoon character. Color Theory, make a perfect cropping of some images using Photoshop, prepare a cut-out of some images using Photoshop, Place nice background for those images, prepare nice background using gradient tool, Scan various images, Color adjustment of those images.

Reference Books:

1. [Learning Illustrator, Ramesh Bangia, Khanna Publishing House](#)

(5.VP.01) Web Applications Lab

- Movie Editing Tools
- Customizing and Embedding, Multimedia Components in Web Pages.
- Web Scripting - Java Script.

(5.VP.02) Illustration and Photo-Editing-Lab

- Script breakdown
- Storyboards
- Costume acquisition
- Sets and Properties design and sourcing
- Location recce and hire
- Location permissions and legal requirements, permissions from civic authorities
- Equipment requirements and bookings
- Travel and Transport
- Catering for crew
- Hospitality for out of town shoots

Detailed Curriculum Level 5

(Semester II)

(5.GV.05) Pre-Production

Unit-I: Research, brainstorming & story concept creation: Intention / purpose & audience (what you intend to say & why), Story structure & character development: Narrative structure and character back story, Sequence & shot analysis: Analysis and re-creation of timing and shot composition from professionally produced film/video productions

Unit-II: Storyboards: Visual design (layout/composition, style, color, lighting etc.); Language of cinema (narrative structure, shot composition, spatial/directional continuity), Animatics / pre-viz: Timing and transitions Audio layering (music, ambient sound, narration) Budgeting and planning: Consideration of schedules, costs and other planning issues

(5.GV.06) Audio Editing

UNIT I

Sonic Sound Forge: Manipulating audio: Auto trim/crop, mute, DC offset, resample, reverse, smooth/enhance, Fade in/out, insert silence, bit depth converter etc., understanding various digital audio formats like .WAV, .AIFF, .MP3, swf, WMA etc., understand audio plug-in, importing and exporting into multiple audio file formats like MP3, real audio, QuickTime formats, etc. Event tool: move, split, slip and trim multiple events, create fades, apply ASR (Attack/Sustain/Release). Understanding script editor window, Spectrum analysis tools, scrub tool etc., statistics tool (Max, RMS, DC offset, zero crossings), sampler tool etc., Audio editing: workflow, real time editing, event based editing, waveform volume and pan envelopes, Edit, record, encode and master digital audio, editing audio by drag and drop options, cross fading audio tracks, balancing sound levels, creating smooth fades etc.

UNIT II

Understanding Multichannel audio recording, synchronize audio and video. Understanding regions and play lists, editing of fields, name markers, loops, and regions, Timing basis: absolute frames, measures and beats, Time and frames. Audio effects like: Equalizer, Volume, chorus, distortion, Delay/echo, pitch, bend/shift, reverb, vibrato, normalize etc. Insert track markers, adding multiple tracks, adjusting track time, musical instrument file processing

Reference Books:

1. [Audio & Video Systems, Bali & Bali, Khanna Publishing House](#)

(5.GV.07) Video Editing

Unit-I: Adobe Premiere: Concept of non-linear editing, The basics of editing: Overview, Importing and Exporting: various audio, video and graphics in various formats, Edit, manipulate and arrange these elements in visual timeline, understand all Tools of toolbox for editing clips. Titling and superimposing.

Unit-II: Panels: Tools panel, Project, Monitors: Source and program, Timeline, Audio meters, Misc. Tasks and functions: Titles, Transitions, speed and duration, Effects, Key frames, Types of edit, Opacity, trimming, Adding Special effects like: Star trek transporter effect, Blur part of an image, Ghost effect, Highlight part of an image etc.

Reference Books:

1. [Audio & Video Systems, Bali & Bali, Khanna Publishing House](#)

(5.GV.08) Communication Skill-II

Unit-I: Communication Process: Basic Communication Skills: Listening, Speaking, Reading and Writing Skills; Precise writing/abstracting/summarizing; Style of technical communication Curriculum vitae/resume writing; Innovative methods to enhance vocabulary, analogy questions.

Unit-II: Structural and Functional Grammar: Agreement of verb with the subject: tense, mood, voice; Writing effective sentences; Basic sentence faults;

Reference Books:

1. [Effective Communication Skills, Kulbushan Kumar, Khanna Publishing House](#)
2. [Business Communications, Varinder Bhatia, Khanna Publishing House](#)

(5.VP.03) Audio Editing Lab

Using Editing Software – editing basics and implementation of various techniques used in non-linear editing. Mastering final edit line – audio levels, color correction, audio mixing, mixed and un-mixed versions, importing and applying compatible graphics files. Understanding compression and its affects along with various methods.

(5.VP.04) Video Editing Lab

- Assisting Production department on shoot
- Assisting Direction department on shoot
- Assisting Art department on shoot
- Assisting Camera department on shoot
- Assisting Sound department on shoot
- Create motion graphic design

Detailed Curriculum Level 6

(Semester I)

(6.GV.01) Principles of Animation and Techniques of Animation

UNIT - 1: Drawings with the help of basic shapes, Animal study, Human anatomy, Shading techniques, Live model study, Introduction- Importance of confidence, Difference between “looking at the drawing” and “seeing the drawing”, What is observation, Procedure- How to approach, Importance of Guideline- Line of action, Overcome the fear, Drawing for animation,

UNIT - 2: An Introduction on how to make drawings for animation, Shapes and forms, about 2d and 3d drawings, Caricaturing – fundamentals, Exaggeration, Attitude, Silhouettes, Boundary- breaking exercises and warm ups, gesture drawing, Line drawing and quick sketches, Drawing from observation, memory and imagination.

UNIT - 3: Drawing for Animation, Exercises and warm ups on pegging sheet, Quick Studies from real life, Sequential movement drawing, caricaturing the Action. Thumbnails, Drama and psychological effect, Motion Studies, Drawing for motion,

UNIT - 4: The Body language, Re-defining the drawings, Introduction to animation production process, Basic Principles in animation, Squash and stretch, Anticipation, Staging, straight ahead and pose to pose, Follow through and overlapping action, Slow in and slow out, Arcs, Secondary action, Timing, Exaggeration, Solid drawing, Appeal, Mass and weight, Character acting, Volume, Line of action, Path of action, Walk cycles-animal and human.

Reference Books:

1. [Multimedia and Animation, V.K. Jain, Khanna Publishing House](#)

(6.GV.02) Basic of 3-D Modelling

UNIT – I: Interface of 3DS max, Understanding the concept of four view ports, Aligning object in the each view port in X, Y, Z axis, Hot keys, User defined hot keys, Using the menus, Floating and docking. Command panel, customizing the interface, Using drag and drop feature, Introduction to different workspaces, "Geometry, Sub objects, Extruding, Welding, bridging etc, Recognizing the workspaces".

UNIT – II: Introduction to standard and extended primitives. "Introduction to creating complex objects with Standard and extended primitives", Understanding the spline tools. Introduction to poly tools. Using modifier stack, navigating the modifier stack, File navigation, Introduction to Connection (Hierarchy, Group, and Link).

UNIT – III: Introduction to the 3d elevators and walk through, "Introduction to modifiers and modifier gizmos, Familiarity with Modifiers like Bend, edit poly, X form, wave, lathe symmetry etc

UNIT – IV: Advanced 3DS Max, Modelling objects with lathe, loft, extrude etc, Creating 3D objects from 2D spline shapes, Organic and inorganic modelling

(6.GV.03) Texture and Lighting

Unit I:

Introduction to texturing, working with Diffuse, Opacity and Reflection, Basics of UV unwrapping, Creating texture maps, Bump and Displacement Mapping, Introduction to Video post, Introduction to standard lights.

Unit II:

Computer Lighting Models, Math for illumination models ,Light and surface physics, Illumination Model examples, Computer Lighting Models, Math for illumination models, Light and surface physics, Illumination Model examples.

Reference Books:

1. [Mastering Photoshop, Web Tech Solutions, Khanna Publishing House](#)

(6.GV.04) Communication Skills III

UNIT-I

Recognizing and Understanding Communication Styles: What is Communication, Passive Communication, Aggressive Communication, Passive-Aggressive Communication, Assertive Communication, Verbal and Non Verbal Communication, Barriers and Gateways to Communication.

UNIT-II

Listening Skills: Types of Listening (theory /definition), Tips for Effective Listening Academic Listening- (lecturing), Listening to Talks and Presentations, Basics of Telephone Communication
Writing Skills: Standard Business letter, Report writing, Email drafting and Etiquettes, Preparing Agenda and writing minutes for meetings, Making notes on Business conversations, Effective use of SMS, Case writing and Documentation

UNIT-III

Soft Skills: Empathy (Understanding of someone else point of view), Intrapersonal skills, Interpersonal skills, Negotiation skills, Cultural Aspects of Communication.

UNIT-IV

Group Communication:

The Basics of Group Dynamics, Group Interaction and Communication, how to Be Effective in Groups, Handling Miscommunication, Handling Disagreements and Conflicts, Constructive Criticism

Reference Books:

1. [Effective Communication Skills, Kulbushan Kumar, Khanna Publishing House](#)
2. [Business Communications, Varinder Bhatia, Khanna Publishing House](#)

(6.VP.01) Digital Animation with Flash Lab

- Data management in postproduction.
- Setting up and preparing editing rooms and sound editing rooms
- Logging of rushes
- Assisting in rough cuts
- Assist in editing line-up
- Assist in synchronizing visuals and dialogue
- Assist in recording and matching sound effects

(6.VP.02) Maya Lab

- Navigate the Maya interface
- Access your objects in the Maya scene graph
- Use the Maya polygon and NURBS modeling tools
- Shade and apply texture maps to objects inside of Maya
- Union: Region belonging to one or both polygons
- Intersection: Region belonging to both polygons
- Difference: Region belonging to first but not second
- Polygon Texturing

Detailed Curriculum Level 6 (Semester II)

(6.GV.05) 3D Animation

Unit I:

Body Mechanics Students learn to use principles of traditional animation within the context of 3D animation by effectively applying them onto the character. Part of good acting for animation is planning. The students learn to create or collect authentic visual references (both still and video) for animating body mechanics and understanding acting. Good poses are not only essential to create believable physicality but also it helps to clearly convey the character emotion for storytelling. They learn the importance of balance and weight, checking the silhouette all the time to make clearer poses. They learn to act out body mechanics, learn the effect of physics (gravity/friction etc.) and artistic Presentation (composition, staging, silhouette etc.) Students learn to convey Emotion not only in the facial expression but also in the body language.

Unit II:

Facial Expression and Lip Sync Foundation of good facial expression depends upon the reference and pre-planning. Detailed expression chart and voice recording is used as a starting point for any facial animation. Students learn to internalize the dialogue and they rehearse the sounds to match the shapes. They also need to draw out key poses before starting to pose in 3D. A good animator needs more skillset than just to be able to animate how to create lip-synch. Students explore how to create the subtle facial expressions to suit the personality of the character and the accent style of the pre-recorded dialogue.

Unit III:

Animation and the Body Exploration of the diverse ways in which the human form takes shape in animated films, from highly photorealistic representations to stream-of-consciousness movement. Specific examples from 2D, 3D, stop-motion and hybrid work will be examined in order to shed light on the construction and animation of the body in contemporary film

Reference Books:

1. [Multimedia and Animation, V.K. Jain, Khanna Publishing House](#)

(6.GV.06) Introduction to 3 D Motion Graphics & VFX

UNIT - I

Concepts for Broadcast animation for logos, channel IDs and montages, Multi-layer compositing, Special effects, Super imposition and titling, Exporting various file formats outputs as per the end user requirements.

UNIT - II

Introduction to batch render & work group, adding cameras & lights to a simple scene to make a complex compositing, Adding 2D back ground and elements into a 3D character layers, Creating object, material IDs for further adding special effects, Effects for digital video 2D layers and 3D layers for more effective outputs, adding particle effects into a scene.

UNIT - III

Introduction to color character and keying, "Editing the real time video with CG based scene and merging both of them to create a final output, Exporting various file format, output as per the end user requirements. UNIT - IV Introduction to the batch rendering and work groups, Introduction to the concepts of editing in terms of compositing, adding special effects in built in compositing software to make a simple shot into a perfect output. UNIT - V Chroma keying, Luma key, Blue screen, Key frame text & layer animation & 3D particles, Effects etc. Color correction, Introduction to 3D compositing concepts i.e. Layers and masking, Rot scoping, Rig removal, Morphing.

Reference Books:

1. [Engineering AutoCAD, Pradeep Jain & A.P. Gautam, Khanna Publishing House](#)

(6.GV.07) Introduction to Rendering

Unit I:

Introduction to rendering concepts; formats and resolutions, Light, color, and color spaces, Local illumination models, Global illumination, Ray tracing, Light, color, and color spaces, Local illumination models, Global illumination, Ray tracing.

Unit II:

Radiosity computation, Volume rendering, Image-based rendering, 3D image warping Light fields, Procedural and image-based texturing and shading, Non-photorealistic rendering, Parallel rendering

(6.GV.08) Communication Skills IV

UNIT I:

Forms of non-verbal communication; interpreting body-language cues; Kinesics; Effective use of body language. The presentation and oral communication skill will be imparted through Group Discussion, Differences between group discussion and debate; Presentation Skills, Oral presentation and public speaking skills; The course also includes training and skill of Technology-based Communication, power-point presentation. Activities/tasks like role playing, group discussion, public speaking, extempore presentation and interviews will be conducted on regular basis.

UNIT 2:

Writing Skills: The activities will include: Writing Task: identifying the focus, generating ideas, outlining, etc. Paragraph Structure and Linking Sub-points in a Paragraph Cohesion and unity in a paragraph, Minding Punctuation and Proofreading, Summarizing, Reviewing and Aspects of Creative Writing. Activities / tasks to be conducted like paragraph writing, essay writing, writing a review of a literary text, writing a summary of a literary text, comprehension and analysis of a literary text, preparing an advertisement.

Reference Books:

1. [Effective Communication Skills, Kulbhushan Kumar, Khanna Publishing House](#)
2. [Business Communications, Varinder Bhatia, Khanna Publishing House](#)

(6.VP.03) 3D Animation Lab

- Assist in laying background music tracks
- Assist in mixing and mastering video
- Assist in creating titles and subtitles and basic animation sequences
- Understand and assist in the execution of modelling and rendering in 3D animation software.

(6.VP.04) 3D Rendering Lab

Introduction to Scene, Preparing the Scene, Basic Settings for Texturing, Create & Assign Textures, Light Setup, V-Ray Rendering Settings

- Rendering with V-Ray
- V-ray light setup
- V-ray rendering settings
- HDRI Illumination
- Fine-tuning shadows
- Final render setting

Detailed Curriculum Level 7 (Semester I)

(7.GV.01) Digital Compositing

UNIT 1: Introduction to Compositing software: Digital compositing has, historically, been considered a “2D” discipline. The term reflects the fact that all the elements that are being brought together are two-dimensional images. They may be a *representation* of a three-dimensional object or scene but they have been captured (or rendered) by a device (or an algorithm) that reduces them to a flat, 2D image.

UNIT 2: But much of your work as a compositor will be to ensure that the images you produce feel as if they were taken from a view of a three-dimensional scene. Objects in your composite will need to reflect the effects of perspective, occlusion, atmospheric depth-cues, etc. And although many of these things can be done using two-dimensional tools, there are times where it is much easier to use tools that are naturally three-dimensional in nature, similar to those tools that are used by 3D artists. Principles of compositing, Basic techniques, Transparency, Rotoscoping, Wire Removal, Chroma key, Layer based compositing, Compositing modes, Animating layers

(7.GV.02) 3D Texturing

UNIT - I

Introduction to basic material types & Procedurals. Study of concepts: Opacity, Smoothness, Specularity, and color, Working with Maya Surface Nodes-Blinn, Phong & Lambert, Working with Transparency, Reflection & Refraction, Bump & Displacement Maps, Introduction to unwrapping, Unwrapping the maps for various 3D characters.

UNIT - II

Working with 2D and 3D Texture, Introduction to the mapping and advanced texturing techniques, Shadow maps; ray traced shadows and radiosity, Creating photo real environments and textures, Basics of Utilities-Reverse, Stencil, Condition, Sampler Information.

(7.GV.03) Basic of Accounts-I

UNIT 1: Define the accounting process. Describe the role of accountants. Explain accounting concepts and principles. Discuss the concept of the accounting equation. Use the accounting equation to analyze basic transactions in terms of increases and decreases. Reporting financial information on a balance sheet. Determine how transactions change owner's equity in an accounting equation. Reporting a changed accounting equation on a balance sheet. Analyze transactions using T-accounts and using debits and credits. Use debits and credits to record increase and decreases in accounts. Record journal entries in a 5-column journal. Define accounting terms related to journalizing transactions. Prove and rule a five-column journal and prove cash

UNIT 2: Prepare a chart of accounts and opening accounts. Post separate amounts from a journal to a general ledger. Post column totals from a journal to a general ledger. Make correcting entries. Reconcile a bank statement and record bank service charges, dishonored checks, and petty cash transactions

(7.GV.04) Computer Graphics

UNIT-I

Graphics Primitives: Introduction to computer graphics, Basics of Graphics systems, Application areas of Computer Graphics, overview of graphics systems, video-display devices, and raster-scan systems, random scan systems, graphics monitors and workstations and input devices. Output Primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary fill and flood fill algorithms.

UNIT-II

2-D Geometrical Transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. 2-D Viewing: The viewing pipeline, viewing coordinate reference frame, window to viewport coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT-III

3-D Object Representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods.

UNIT-IV

3-D Geometric Transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D Viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

Reference Books:

1. [Computer Graphics, Rishabh Anand, Khanna Publishing House](#)
2. [Computer Graphics, Gautam Roy, Khanna Publishing House](#)

(7.VP.01) Digital Compositing Lab

- 2D animation preproduction
- 2D character design
- 2D environment and background layout
- Motion graphic sequences

(7.VP.02) 3D Texturing Lab

1. Applying Texture for inorganic polygon models- I (Lamps, Mobile, Planet, Land with grass texture, rock, atmospheric objects system)
2. Applying Texture for organic polygon models – I (Cartoon, Semi cartoon)
3. Applying Texture for inorganic polygon models - II (Solar system, Car, Bike, Plane)
4. Applying Texture for organic polygon models - II (Human, Animal)
5. Applying Texture for organic Subdivision models – I (Cartoon, Semi cartoon)
6. Applying Texture for inorganic Subdivision models - II (Solar system, Car, Bike, Plane)
7. Applying texture for rendering final output with organic and inorganic objects

Detailed Curriculum Level 7 (Semester II)

(7.GV.05) Muscle System

Unit I:

Introduction to bone system/Joints and IK handles, creating bone system and maintaining naming conventions,

Unit II:

Skinning: types, import and export of skin weights, IK and FK basics, IK and FK switch, stretchy IK and FK,

Unit III:

Introduction to Deformers: attics, wrap, cluster, riggle, wire etc. Use of deformers in rigging process.

(7.GV.06) Rigging

UNIT -I

Introduction to constraints and implementation to rigging, maintaining proper hierarchy, grouping and creating controls, Rigging the characters, Introduction to Muscle system, working with Muscle rigging, Introduction to automated rigging systems and methods.

UNIT - II

Embedding small scripts in the hierarchy control system, to save time and facilitate handling", Advanced rigging, Vertex weighting techniques, rigging solutions to Anatomical Problems, using advanced rigging to archive natural articulation of character.

(7.GV.07) Advanced Modelling with Z- Brush

UNIT - I

Z-Brush 2 features, system requirement, Z-Brush 2 concept, working with Z-Brush 2, working with the canvas, working with layouts, working with palettes, Z-Brush 2 configuration, using start-up documents, tray modes, working with Z-Script palette and working with the preference palette.

UNIT - II

Types of tools in Z-Brush 2, modes, options and related palettes, explaining the tool palette, working with tools, working with pixel-based tools, working with gyro tool, Autodesk Maya and Autodesk 3D max settings, introduction to curves, the alpha adjust curve, the edit curve, the smoothing curve, the diffuse curve, the specular curve, the trans curve, the reflect curve, the noise curve and the intensity curve.

UNIT - III

Strokes, lighting, shadows, transformation, working with alphas, texture concepts, texture inventory, understanding the texture palette, texture mapping, seamless textures, painting textures and materials

UNIT - IV

Creases mesh visibility, morph target, multi-resolution modelling, edge loop, different maps, explain projection master, working with Z Spheres, understanding adaptive skinning and understanding unified skinning. UNIT - V Sculpting, sculpting brushes, using stencils, sculpting using projection master, understanding and render palette and posing characters.

(7.GV.08) Basics of Accounts-II

UNIT 1: Describe and prepare the work sheet. Plan and adjust entries on a work sheet. Extend financial statement information on a work sheet. Find and correct errors on a work sheet. Describe the content and purpose of the three basic financial statements and how they are related. Prepare financial statements directly from the work sheet with a net income and a net loss. Journalize and post adjusting entries. Journalize and post-closing entries and prepare a post-closing trial balance.

UNIT 2: Describe the nature of merchandising business. Describe and be able to journalize purchases of merchandise for cash. Describe and be able to journalize purchases of merchandise on account and buying of supplies. Describe and be able to journalize cash payments and other transactions. Journalizing sales (compute sales tax) and cash receipts. Describe the concept of subsidiary ledgers. Journalize and post using accounts payable subsidiary ledgers. Journalize and post using accounts receivable subsidiary ledgers.

(7.VP.03) Maya Muscle Lab

Practical's based on theory to be implemented in Autodesk Maya Muscle

(7.VP.04) Rigging with Maya Lab

- 3D modelling
- 3D animation
- 3D Rigging
- Texturing and Lighting
- Rendering and compositing