



SAVITRIBAI PHULE PUNE UNIVERSITY
(FORMERLY UNIVERSITY OF PUNE)

THREE YEAR B. SC. ANIMATION DEGREE PROGRAM
(FACULTY OF SCIENCE & TECHNOLOGY)

CHOICE BASED CREDIT SYSTEM SYLLABUS
TO BE IMPLIMENTED FROM ACADEMIC YEAR 2022-2023

**TABLE -1
STRUCTURE FOR F Y B SC ANIMATION**

| SEMESTER 1 | | | | | | | | | |
|----------------------|---|-------------------------------------|-----------------|------------------|-------------------------------------|------------------|--------------|---------------|------------|
| COURSE CODE | COURSE | TEACHING SCHEME HOURS / WEEK | | | EXAMINATION SCHEME AND MARKS | | | CREDIT | |
| | | THEORY | TUTORIAL | PRACTICAL | C E | EN D-SE M | TOTAL | T H | P R |
| ANM101 | FOUNDATION OF ART | 04 | -- | -- | 30 | 70 | 100 | 04 | -- |
| ANM102 | BASICS OF ANIMATION | 04 | -- | -- | 30 | 70 | 100 | 04 | -- |
| ANM103 | INTRODUCTION TO DIGITAL GRAPHICS - IMAGE EDITING (VECTOR) | 04 | -- | -- | 30 | 70 | 100 | 04 | -- |
| ANM104 | INTRODUCTION TO PROGRAMMING LANGUAGES | 04 | -- | -- | 30 | 70 | 100 | 04 | -- |
| ANM105 | FOUNDATION OF ART (SKETCHING) & FLIPBOOK ANIMATION | -- | -- | 03 | 15 | 35 | 50 | -- | 1.5 |
| ANM106 | INTRODUCTION TO DIGITAL GRAPHICS - IMAGE EDITING (VECTOR) | -- | -- | 03 | 15 | 35 | 50 | -- | 1.5 |
| ANM107 | PROGRAMMING WITH C | -- | -- | 03 | 15 | 35 | 50 | -- | 1.5 |
| ANM108 | 3D VISUALIZATION (3DS MAX) | -- | -- | 03 | 15 | 35 | 50 | -- | 1.5 |
| TOTAL CREDITS | | | | | | | | 16 | 06 |
| TOTAL | | 16 | -- | 12 | 180 | 420 | 600 | 22 | |

ABBREVIATIONS:

TW: TERM WORK **TH:** THEORY **OR:** ORAL **TUT:** TUTORIAL
PR: PRACTICAL

| TABLE -2 | | | | | | | | | |
|---|--|---|----------------------|-----------------------|---|--------------------------|-------------------|--------------------|----------------|
| STRUCTURE FOR F Y B SC ANIMATION | | | | | | | | | |
| SEMESTER 2 | | | | | | | | | |
| COURS E CODE | COURSE | TEACHING SCHEME HOURS / WEEK | | | EXAMINATION SCHEME AND MARKS | | | CRED IT | |
| | | THE ORY | TUTO RIAL | PRACT ICAL | CE | END - SEM | TOT AL | T H | P R |
| ANM20 1 | DIGITAL PHOTOGRAPH Y & FILMMAKING FUNDAMENT ALS | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM20 2 | ELEMENTS OF INFORMATIO N TECHNOLOGY | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM20 3 | INTRODUCTIO N TO 2D ANIMATION | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM20 4 | 3D ANIMATION-I (MAYA) | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM20 5 | DIGITAL PHOTOGRAPH Y & FILMMAKING PRACTICALS | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM20 6 | IMAGE EDITING | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM20 7 | 2D ANIMATION (ADOBE ANIMATE) | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM20 8 | 3D ANIMATION-I (MAYA) | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| TOTAL CREDITS | | | | | | | | 1 6 | 06 |
| TOTAL | | 16 | -- | 12 | 18 0 | 420 | 600 | 22 | |

ABBREVIATIONS:

TW: TERM WORK **TH:** THEORY **OR:** ORAL **TUT:** TUTORIAL
PR: PRACTICAL

| TABLE -3 | | | | | | | | | |
|---|---|---|----------------------|-----------------------|---|--------------------------|-------------------|--------------------|----------------|
| STRUCTURE FOR S Y B SC ANIMATION | | | | | | | | | |
| SEMESTER 3 | | | | | | | | | |
| COURS E CODE | COURSE | TEACHING SCHEME HOURS / WEEK | | | EXAMINATION SCHEME AND MARKS | | | CRED IT | |
| | | THE ORY | TUTO RIAL | PRACT ICAL | CE | END - SEM | TOT AL | T H | P R |
| ANM30 1 | ANIMATION TECHNIQUE | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM30 2 | 3D PRODUCTION- II (MAYA) | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM30 3 | ANIMATION PRODUCTION PROCESS | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM30 4 | WEB TECHNOLOGY WITH HTML & CSS | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM30 5 | ANIMATION TECHNIQUE | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM30 6 | 3D PRODUCTION- II (MAYA) | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM30 7 | ANIMATION PRODUCTION PROCESS | | | 03 | 15 | 35 | 50 | -- | 1. 5 |
| | ENVIRONMEN TAL SCIENCE- I | 02 | -- | -- | 15 | 35 | 50 | 0 2 | -- |
| | LANGUAGE COMMUNICA TION-I | 02 | -- | -- | 15 | 35 | 50 | 0 2 | -- |
| TOTAL CREDITS | | | | | | | | 1 6 | 06 |
| TOTAL | | 16 | -- | 12 | 18 0 | 420 | 600 | 22 | |

**LANGUAGE COMMUNICATION - I (VALUE EDUCATION)*

**TABLE -4
STRUCTURE FOR S Y B SC ANIMATION**

| SEMESTER 4 | | | | | | | | | |
|----------------------|---|------------------------------|-----------|-----------|------------------------------|------------|------------|-----------|-----------|
| COURSE CODE | COURSE | TEACHING SCHEME HOURS / WEEK | | | EXAMINATION SCHEME AND MARKS | | | CREDIT | |
| | | THEORY | TUTORIAL | PRACTICAL | CE | END - SEM | TOTAL | TH | PR |
| ANM401 | ANIMATION FOR AR AND VR TECHNIQUES | 04 | -- | -- | 30 | 70 | 100 | 04 | -- |
| ANM402 | 3D SCULPTING TOOLS & TECHNIQUES (Z BRUSH) | 04 | -- | -- | 30 | 70 | 100 | 04 | -- |
| ANM403 | GAME DESIGN (BLENDER) | 04 | -- | -- | 30 | 70 | 100 | 04 | -- |
| ANM404 | ANIMATION FOR AR AND VR TECHNIQUES | -- | -- | 03 | 15 | 35 | 50 | -- | 1.5 |
| ANM405 | 3D SCULPTING TOOLS & TECHNIQUES (Z BRUSH) | -- | -- | 03 | 15 | 35 | 50 | -- | 1.5 |
| ANM406 | GAME DESIGN (BLENDER) | -- | -- | 03 | 15 | 35 | 50 | -- | 1.5 |
| ANM407 | CHARACTER ANIMATION (MAYA/3DMA X/BLENDER) | | | 03 | 15 | 35 | 50 | -- | 1.5 |
| | ENVIRONMENTAL SCIENCE-II | 02 | -- | -- | 15 | 35 | 50 | 02 | -- |
| | LANGUAGE COMMUNICATION-II | 02 | -- | -- | 15 | 35 | 50 | 02 | -- |
| TOTAL CREDITS | | | | | | | | 16 | 06 |
| TOTAL | | 16 | -- | 12 | 180 | 420 | 600 | 22 | |

**LANGUAGE COMMUNICATION - II (PROFESSIONAL COMMUNICATION SKILL)*

**TABLE -5
STRUCTURE FOR T Y B SC ANIMATION**

| SEMESTER 5 | | | | | | | | | |
|-----------------------------|---|---|----------------------|-----------------------|---|--------------------------|-------------------|--------------------|----------------|
| COURS E CODE | COURSE | TEACHING SCHEME HOURS / WEEK | | | EXAMINATION SCHEME AND MARKS | | | CRED IT | |
| | | THE ORY | TUTO RIAL | PRACT ICAL | CE | END - SEM | TOT AL | T H | P R |
| ANM50 1 | VISUAL EFFECTS (NUKE) | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM50 2 | GAME PRODUCTION (UNITY) | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM50 3 | UI & UX DESIGN | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM50 4 | MOTION GRAPHICS AND COMPOSITING | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM50 5 | VISUAL EFFECTS (NUKE) | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM50 6 | GAME PRODUCTION (UNITY) | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM50 7 | DIGITAL EDITING (ADOBE PREMIER) | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM50 8 | MOTION GRAPHICS AND COMPOSITING (ADOBE AFTEREFFECT S) | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| TOTAL CREDITS | | | | | | | | 1 6 | 06 |
| TOTAL | | 16 | -- | 12 | 18 0 | 420 | 600 | 22 | |

**TABLE -6
STRUCTURE FOR T Y B SC ANIMATION**

| SEMESTER 6 | | | | | | | | | |
|-----------------------------|--|---|----------------------|-----------------------|---|--------------------------|-------------------|--------------------|----------------|
| COURS E CODE | COURSE | TEACHING SCHEME HOURS / WEEK | | | EXAMINATION SCHEME AND MARKS | | | CRED IT | |
| | | THE ORY | TUTO RIAL | PRACT ICAL | CE | END - SEM | TOT AL | T H | P R |
| ANM60 1 | IPR & CYBER SECURITY | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM60 2 | NEW MEDIA | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM60 3 | WHITE BOARD AND EXPLAINER VIDEO ANIMATION | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM60 4 | BASICS OF MARKETTING , MANAGEMEN T & PORTFOLIO DEVELOPMEN T | 04 | -- | -- | 30 | 70 | 100 | 0 4 | -- |
| ANM60 5 | PORTFOLIO DEVELOPMEN T | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM60 6 | PROJECT | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM60 7 | INTERNSHIP | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| ANM60 8 | INTERNSHIP | -- | -- | 03 | 15 | 35 | 50 | -- | 1. 5 |
| TOTAL CREDITS | | | | | | | | 1 6 | 06 |
| TOTAL | | 16 | -- | 12 | 18 0 | 420 | 600 | 22 | |

DR SAMEER SAHASTRABUDDHE
CHAIRMAN
BOARD OF STUDIES
B SC ANIMATION

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: S.Y.
Revised syllabus to be implemented from Academic year 2022-2023
Credits: 04 each | Total Lectures 60
Subject: ANM301 Animation Technique
Semester III

| ANM301 Animation Technique | | |
|-----------------------------------|---|-----------------|
| Semester III | | |
| Chapter | Topic Name | Lectures |
| 01 | Clay Animation 1.1 Process 1.2 Preparation 1.3 Designing puppet 1.4 Performance 1.5 Post-production | 05 |
| 02 | Introduction to Adobe After Effects 2.1 Interface 2.2 Customization 2.3 creating composition 2.4 working with layers 2.5 3D layer | 02 |
| 03 | Basic Animation 3.1 Tool bar 3.2 Render settings 3.3 Various exporting formats 3.4 Frame rate. | 02 |
| 04 | Using effects 4.1 Chroma removal 4.2 Compositing 4.3 Key light and other key 4.4 Assignment. | 06 |
| 05 | Applying effects 5.1 Effect controls 5.2 Use of few effects 5.3 Particles and their use | 05 |

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|-----------|---|-----------|
| 06 | Wire Removal 6.1 Rotoscopy using masks 6.2 Clean Plates 6.3 Create BG Plates | 05 |
| 07 | Tracking 7.1 One point tracking 7.2 2 & 4-point tracking 7.3 Camera tracking 7.4 Assignment. | 06 |
| 08 | Camera 8.1 Camera controls 8.2 Lights 8.3 Using camera and lights. | 03 |
| 09 | Titling 9.1 Creating credits 9.2 Motion graphics 9.3 Creating motion graphics 9.4 Project. | 06 |

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: S. Y.
Revised syllabus to be implemented from Academic year 2022-2023
Credits: 04 each | Total Lectures - 60
Subject: ANM302 - 3D Production-II (Maya)

Semester III

ANM302 3D Production-II (Maya)

Semester III

| Chapter No. | Topic Name | Lectures |
|--------------------|---|-----------------|
| 1 | Interface Autodesk Maya 1.1 Creating and Editing Nodes Using the Hypergraph, Connecting Nodes with the Node Editor Creating Node Hierarchies in the Outliner, Displaying Options in the Outliner, 3D views, The Channel Box, The Attribute Editor, Working with Shader Nodes in the Hyper-shade 1.2 Creating Maya Projects Creating a New Project, Editing and Changing Projects | 3 |
| 2 | Character Modeling 2.1 Realistic Human character modelling using Box Modeling or Patch modelling method, Image plane setup 2.2 Human Face blocking and Modeling 2.3 Hand and palm Blocking and Modeling 2.4 Torso Blocking and Modeling 2.5 Leg and Toe Modeling 2.6 Digital sculpting basics using Sculpting Toolset | 07 |
| 3 | Texturing Lighting Arnold Renderer 3.1 Intro to various Arnold shaders 3.2 Various Presets in AI standard surface, 3.3 Different types of Arnold shaders e.g., AI standard, Ambient occlusion, AI Mix, AI Wireframe etc. 3.4 Introduction to Maya Basic lighting 3.5 Arnold Light -Area Light, Sky Dome light, Mesh Light, Photometric light, etc. 3.6 Arnold render setup, 3.7 Arnold render view, IPR renderer, region selection, 3.8 Render passes Cache settings 3.9 Sky dome setting using HDRI light system Image based light - | 5 |
| 4 | Rigging and Muscle Systems 4.1 Understanding Rigging 4.2 Creating and Organizing Joint Hierarchies Orienting Joints, Naming Joints, Mirroring Joints, 4.3 Rigging the Character, IK Legs FK Blending, Rotate Plane Solver, Creating Custom Attributes, Spline IK 4.4 Human Inverse Kinematics Skeleton Generator, Character Controls, Interoperability 4.6 Skinning Geometry Interactive/Smooth Binding, Weighting the Giraffe, Geodesic Voxel Binding, Painting Skin Weights, Editing Skin Weights in the Component Editor, Copying Skin Weights, Mirroring Skin Weights | 07 |

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| | <p>4.7 Quick Rig – Auto rig and step by step method</p> <p>4.8 The Maya Muscle System</p> <p>Understanding the Maya Muscle System</p> <p>Create Muscles Using the Muscle Builder</p> <p>Editing Muscle Parameters, Converting the Smooth Skin to a Muscle System, Sliding Weights</p> | |
| 5 | <p>Animation Techniques</p> <p>5.1 Understanding Animation Principles</p> <p>5.2 Body language and Acting</p> <p>5.3 Keyframe Animation, Creating Keyframes</p> <p>Auto Keyframe, Moving and Scaling Keyframes on the Timeline</p> <p>5.4 Play-blast and F-Check</p> <p>5.5 Driven Keys: Creating a Driven Key Looping Driven Keys, Copying and Pasting Driven Keys, Constrains</p> <p>5.6 Walk Cycle, Run cycle Jump cycle</p> <p>5.7 Animate Character, throwing a ball</p> <p>5.8 Moving object using Path constraint</p> | 07 |
| 6 | <p>Rendering for Compositing</p> <p>6.1 Render Layers</p> <p>Creating Render Layers, Render Layer Overrides, Creating Overrides for Rendering Cameras, Material Overrides Render Layer Blend Modes,</p> <p>6.2 Render Passes</p> <p>Upgrading Materials for Rendering Passes, Rendering Multiple Passes from a Single Render Layer</p> <p>Creating an Ambient Occlusion Render Pass</p> <p>6.3 Setting Up a Render with Arnold</p> <p>Specifying Frame Range, Renderable Cameras</p> <p>File Formats and the Frame Buffer, Starting a Batch Render</p> <p>Command-Line Rendering</p> | 05 |
| 7 | <p>Maya FX, Dynamics</p> <p>7.1 Creating nCloth Objects</p> <p>Making a Polygon Mesh Dynamic Bedsheet</p> <p>Applying nCloth Presets, Making Surfaces Sticky</p> <p>Creating nConstraints, making nCloth Objects Expand</p> <p>Using Pressure, Additional Techniques, Creating an nCache</p> <p>7.2 Creating nCloth Flag simulation</p> <p>7.3 Rigid Body Dynamics: Animate a Ball hits the stumps</p> <p>7.4 Maya Motion graphics with Mash: Create a metallic chain using Maya Mash network and Mash editor</p> <p>7.5 Create a Perl Necklace using MASH</p> <p>7.6 Create a Rope or thread wire using MASH</p> | 5 |

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|--|--|----|
| 8 | XGen 8.1 Introduction to XGen toolset in Maya 8.2 create a grassland using Maya Xgen 8.3 create realistic Human hair using XGen Interactive Groom settings 8.4 use of cut length width comb grab smooth noise freeze tools and 8.5 Description channel and Add modifier | 03 |
| 9 | Maya Bifrost 9.1 Maya Bifrost – create simulation using Liquid, Aero, fire, smoke etc. 9.2 Introduction to Bifrost Node Editor and Node Network 9.3 Fluid Simulation 9.4 Introduction to Bifrost Liquid, Bifrost Aero 9.5 Add Emitter, Collider, Foam, Kill plane, Adaptive Mesh 9.6 Emission Region, Motion Field Flush Scratch Cache 9.7 Create an Ocean simulation using Bifrost liquid 9.8 Create a wine bottle containing liquid which can be filled a glass later | 03 |
| Reference Books: <ol style="list-style-type: none"> 1. Mastering Autodesk Maya 2015, Author - Todd Palmar 2. Maya 2017 Bifrost Liquid Author: Wanho Choi 3. Autodesk Maya 2020 Documentation | | |

Savitribai Phule Pune University, Pune

Course Name: B. Sc. Animation Class: S.Y.

Revised syllabus to be implemented from Academic year 2022-2023

Credits: 04 each | Total Lectures 60

**SUB: ANM 303 - Animation Production Process
Semester III**

| Chapter No. | Topic Name | Number of Lectures |
|-------------|---|--------------------|
| 1 | 1.1 Pre-Production- 1.1 The Idea and Story- 1.2 How to develop a story? 1.3 Where Do Ideas Come From? The Script , Script Terms <ul style="list-style-type: none"> ● (e.g. Action, Angle on, Beat) ● Script Process ● Springboard (not as common) ● Premise ● Outline (Animation Writing Development-----) ● First draft ● Second draft ● Polish ● Script Format ● Slug lines / scene headings ● Action description ● Dialogue ● Parenthetical ● Transitions <ul style="list-style-type: none"> ● Script Writing software | 06 |
| 2 | 2.2 Developing Script for Animation <ul style="list-style-type: none"> ● The 3-D Script vs. the 2-D Script ● Theatrical ● Direct-to-video ● Television ● Television Animation and Feature Animation 2.3 Dialogue <ul style="list-style-type: none"> ● The Purpose of Dialogue ● Revealing Character ● Moving the Story Along with Dialogue <ul style="list-style-type: none"> ● Characteristics of Dialogue | 05 |
| 3 | Visual Development 3.1 Concept Art or Production Design (Three types of Concept Arts) | 02 |
| 4 | Character Design and Background design <ul style="list-style-type: none"> ● Types of People ● Anthropomorphism ● Personality ● Appeal ● Character Bible and Design ● Different types of Characters- Male, female, children ● Character Proportion ● Character Construction ● Costume | 04 |

| | | |
|----------|---|-----------|
| | <ul style="list-style-type: none"> • Drawing for Character (Character Model Sheets, Props.) • What is Reference Map? Research –BG, Color, Composition etc.... | |
| 5 | Storyboards 5.1 Story Board Elements, <ul style="list-style-type: none"> • Types of Story Boards • What is Visual Literacy in Storyboards? • Application of animation principles in Storyboard. • Aspect ratio • Shot choice • Composition within your picture frame • FG-BG-MG • Perspective, • Focal Point • Depth, • Camera lenses • The Story Point • Emotional response • Storyboarding - Script Analysis - Thumbnails – Final Storyboard 5.2 Digital Storyboarding <ul style="list-style-type: none"> • The Conventions of the Cinema for storyboarding. 5.3 Animatic | 12 |
| 6 | Production (in Various Techniques) 6.1 2D Animation <ul style="list-style-type: none"> • What is 2D Animation • Advantages and disadvantages and solutions • Separation of characters and background in traditional 2D animation • Traditional Tools • Digital Traditional: Software for Traditional 2D Animation • Exposure Sheet 6.2 Stop Motion Animation <ul style="list-style-type: none"> • Puppet Animation • Pixilation • Cut out • Sand and Plasticine • Concept and Pre Production • Production Design to Puppet and Prop Building • Camera and Lighting • Animation • Speech and lip syncing • Post production | 05 |
| 7 | 7.1 3D Animation <ul style="list-style-type: none"> • Modeling • Material and textures | 03 |

| | | |
|----------|---|-----------|
| | <ul style="list-style-type: none"> ● Which software needs to be used? Agony of Choice. ● Layout and Cameras ● Rigging ● Character Animation and Motion Capture ● Lighting ● Effects and Simulations ● Rendering <p>Live Action Film</p> | |
| 8 | <p>Post Production</p> <ul style="list-style-type: none"> ● VFX ● Sparks ● Pixie Dust ● Dust ● Smoke ● Lens flare ● Rain/Snow ● Camera shake ● Rotoscoping , Fire/water ● Compositing ● Editing ● Final Output <p>8.1 Sound in Post Production</p> <ul style="list-style-type: none"> ● Voice Recording. ● Foley and sound effects <p>Speech that is over-dubbed or recorded.</p> | 05 |
| | <p>Reference Links</p> <p>https://www.masterclass.com/articles/what-is-concept-art</p> <p>https://dreamfarmstudios.com/blog/3d-animation-pipeline/</p> | |
| | <p>Reference Books</p> <ul style="list-style-type: none"> ● Animation Writing Development Script Pitch by Jean Ann Wright – Focal Press ● Professional Storyboarding_ Rules of Thumb by Sergio Paez and Anson Jew ● Writing for Animation, Comics, and Game by Christy Marks – Focal Press ● Animation - From Concept to Production by Hannes Rall - CRS Press ● The Fundamentals of Animation by Paul Wells and Samntha Moore - Bloomsbury Publication | |

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: F.Y.
Revised syllabus to be implemented from Academic year 2022-2023
Credits: 04 each | Total Lectures 60
SUB: ANM 304 Web Technology with HTML and CSS
Semester III

| Web Technology with HTML and CSS | | |
|---|--|---------------------------|
| Sr. No. | Topics | Number of Lectures |
| 01 | Introduction to HTML How the Web Works? What is a Web Page? Various attributes of a web page: Editors, Elements & Attributes, Head, Meta, Body, Style, Paragraphs, Headings, Bold, Line Breaks, Horizontal Rule, Pre, Italic, Code, Superscript, Subscript, Strikethrough, Comments, Upload, Text area, Charset, URL Encoding, XHTML, Lists, Images, Scripts, E-mail, Text Links, Image Links, Tables, Special Tags, Blocks & Inline, Layouts, Entities, Symbols, | 10 |

| | | |
|----|---|----|
| | Responsive, IFrames, Forms, Input, Text Fields, Password, Reset, Submit, Checkboxes, Radio, Select, Hidden Fields | |
| 02 | Introduction to CSS Syntax, CSS ID & Class | 05 |
| 03 | CSS Styling Backgrounds, Text, Fonts, Links, Lists, Tables | 05 |
| 04 | CSS Box Model Border, Outline, Margin, Padding | 05 |
| 05 | CSS Advanced Grouping/Nesting, Dimension, Display, Positioning, Floating, Align, Pseudo-class, Pseudo-element, Navigation Bar, Image Gallery, Image Opacity, Image Sprites, Media Types, Attribute Selector | 07 |

Reference books:

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: S. Y.
Revised syllabus to be implemented from Academic year 2022-2023

Semester 3: Practical - ANM 305- Lab I
Based on Subjects: 1. Animation Technique (ANM 305)

The list suggested for practical are not to be implemented using EQUAL timeframes (like 1 hr/2 hrs etc), but can be implemented using variable timeframes. The objective is to match the overall time mentioned (in brackets) in front of each domain.

Adobe after Effects is a digital visual effects, motion graphics, and compositing application developed by Adobe Systems and used in the post-production process of film making, video games and television production. Among other things, After Effects can be used for keying, tracking, compositing, and animation. It also functions as a very basic non-linear editor, audio editor, and media transcoder. In 2019, the program won an Academy Award for scientific and technical achievement:

Our students use Photoshop to:

- Understand terminology used in the video post-production process
- Work with content on the Timeline
- Understand how to work with layers
- Add text and other objects to a composition
- Add effects and animation to objects and text

- Edit applied effects and animation
- Import After Effects content into Premiere Pro with Adobe Dynamic Link
- Export a completed video

**Practical List
Hrs)**

(30

1. Create 5 different clay Model Using Clay (Also understand the concept and Texture of Clay Model with the help of BG).
2. Create 3 different Cut out Characters (Any 2 leg Cartoon character, any 4 Leg Character, Office Man/ School Girl.)
3. Create Typography Animation.
4. Create Pin Screen Animation.
5. Create Flip Book.
6. Create Facial Expression of Any One Man/Women.
7. Remove any Character for from Footage.
8. Create Clean Plate Footage using content Aware fill tool
9. Create Roto of any footage and change its BG also.
10. Use Multipoint Tracking and Replace any Object form Footage.
11. Use Wrap Stabilizer to shaky Footage for Stable.
12. Create Proper Titles Sequence and subtitle also, related to your Footage.

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Semester 3: Practical - ANM 306- Lab II
Based on Subjects : 1. 3D Production-II (Maya)

**Based on ANM 305 for Third Semester
HRS**

30

1. Create Realistic 3D Interior scene which is rendered using Arnold Maya.
Use various shapes other than square and rectangle to show the interior (furniture), also use various levels instead of everything on walls or on ground only.-
2. Create and render 3D Village scene and render with Arnold and HDRI
3. Model a Machine Gun Texture and render with Arnold
4. Model a 3D cartoon Character (any from TV Series)
5. Rigg, skin and weight a cartoon 3D character
6. UVW unwrap and texture (with P-Shop) a 3D character
7. Create N-Cloth: Cover Dining table and bed with a cloth

8. Animate walk cycle of 3D Cartoon Character

9 Make realistic Hair on a 3D Model using X-Gen

10 Create liquid simulation: pour water from a bottle to a glass. Use Bifrost

Students Should Present Journal of Maya Practical at the end of the Semester.

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Course Name: B. Sc. Animation Class: S. Y.
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Semester 3: Practical - ANM 307- Lab III
Based on Subjects: 1. Animation Production Process

1.

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: F.Y.
Revised syllabus to be implemented from Academic year 2022-2023
Credits: 04 each | Total Lectures 60
SUB: Language Communication - I
Semester III

| Web Technology with HTML and CSS | | |
|---|---------------|---------------------------|
| Sr. No. | Topics | Number of Lectures |

| | | |
|----|--|----------------------------------|
| 01 | <p><u>LITERATURE</u></p> <p>1. Short Story: i) 'A Shadow': R. K. Narayan</p> <p>2. Poetry: i) La Belle Dame sans Merci: John Keats ii) Where the Mind is without Fear: Rabindranath Tagore</p> <p>3. Practical/Discussion</p> | 10 05 |
| 02 | <p><u>CONVERSATIONAL SKILL</u></p> <p>(Sample Dialogues, Useful Expressions and Exercises)</p> <p>1. Introducing Yourself and Others 2. Asking, Giving and Refusing Permission 3. Describing Daily Routine 4. Complaining and Apologizing</p> <p>5. Practical/Discussion</p> | 10 05 |
| 03 | <p><u>INTERVIEW TECHNIQUES</u></p> <p>1. Job Application Letter 2. Resume Writing 3. GDPI 4. Presentations</p> <p>5. Practical/Discussion</p> | 10 05 |

BIBLIOGRAPHY:

1. Adair, John. Effective Communication, London: Pan Macmillan Ltd. 2003.
2. Amos, Julie-Ann. Handling Tough Job Interviews. Mumbai: Jaico Publishing, 2004.
3. Baron, N.S., (2008). Always On: Language in an Online and Mobile World. Oxford University Press. Oxford.
4. Borg, James.(2010). Body Language: 7 Easy Lessons to Master the Silent Language. FT Press.
5. Collins, Patrick. Speak with Power and Confidence. New York: Sterling, 2009.
6. Kroehnert, Gary. Basic Presentation Skills. Sidney: McGraw Hill, 2010.
7. Linda B., Iris V. (2001). Intercultural Communication in the Global Workplace. 2nd Edition. Tata McGraw
8. Mitra, B. (2011). Personality Development & Soft Skills. 1st edition. Oxfor.
9. Moore, Ninja-Jo, et al. Nonverbal Communication: Studies and Applications. New York: Oxford University Press, 2010.
10. Nelson, Paul E. & Judy C. Pearson, Confidence in Public Speaking.
11. Prasad, H. M. How to Prepare for Group Discussion and Interview. New Delhi: Tata McGraw-Hill Publishing Company Limited, 2001.
12. Pease, Allan. Body Language. Delhi: Sudha Publications, 1998.
13. Raman, Meenakshi & Sangeeta Sharma. Technical Communication: Principles and Practice. Second Edition. New Delhi: Oxford University Press, 2011.
14. Rutherford, Andrea J. Basic Communication Skills for Technology: Second Edition. Delhi: Pearson Education, 2007.
15. Sharma, R. C. & Krishna Mohan. Business Correspondence and Report Writing: Third Edition. New Delhi: Tata McGraw-Hill Publishing company Limited, 2007.

WEB LINKS:

<http://networketiquette.net/>

<https://public.wsu.edu/~brians/errors/>

http://users3.ev1.net/~pamthompson/body_language.htm

<http://www.albion.com/netiquette/corerules.html>

http://www.bbc.co.uk/worldservice/learningenglish/radio/specials/1535_questionanswer/page15.shtml

<http://www.colostate.edu/Depts/Speech/rccs/theory44.html>

<http://www.dailywritingtips.com/>

EVALUATION PATTERN

Considering the choice-based credit system (CBCS) and the semester pattern, both Semesters-III

& IV will have a uniform evaluation pattern of **50 marks** each. There will be an '**Internal Examination**' for **15 marks** and **Semester-end Examination** for **35 marks**.

The Internal Examination for **15 marks** will be conducted in two parts.

1) Practical Examination for 05 marks:

(The choices like Group Discussion, Mock Interviews, Seminar, Project Presentation, Role Play, Home Assignment, Library Work, Lecture Notes etc. can be considered.)

2) A Mid-semester Written Test for 10 marks:

The Mid-semester Written Test will be based on the book prescribed for the syllabus. The test aims at assessing students' writing competence in general. Hence, descriptive and essay type questions can be considered while setting the question paper.

Semester-end Examination:

The Semester-end Examination will have a uniform question paper pattern for both semesters.

The pattern of the question paper is given below.

SEMESTER-END EXAMINATION Question Paper Patterns (Sem-III)

**Marks: 35
Hours**

Time: 2 Clock

Instructions:

- 1. All questions are compulsory.**
- 2. Figures to the right indicate full marks.**

| | |
|---|------|
| Q.1) Long-answer question on Unit-1 (Any 1 out of 2) | (15) |
| Q.2) Short notes on Unit-2 (Any 2 out of 3) | (10) |
| Q.3) Short notes on Unit-3 (Any 2 out of 3) | (10) |

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: Second Year
Revised syllabus to be implemented from Academic year 2022-2023
Credits: 02 each | Total Lectures 45
Subject: ANM 401 Animation for AR VR Techniques
Semester IV

| Sr. No | Chapter | Hours |
|-----------|---|-----------|
| 01 | Introduction to Virtual Reality Introduction <ul style="list-style-type: none"> • Fundamental Concept and Components of Virtual Reality. • Primary Features and Present Development on Virtual Reality. • Computer graphics • Real time computer graphics • Flight Simulation • Virtual environment requirement, • benefits of virtual reality • Historical development of VR • Scientific Landmark 3D Computer Graphics: Introduction • The Virtual world space. • positioning the virtual observer • the perspective projection • human vision • stereo perspective projection • 3D clipping • Color theory • Simple 3D modelling • Illumination models • Reflection models • Shading algorithms • Radiosity • Hidden Surface Removal • Realism-Stereographic image | 06 |
| 02 | Interactive Techniques in Virtual Reality <ul style="list-style-type: none"> • From 2D to 3D • 3D space curves • 3D boundary representation Geometrical Transformations: • Introduction Frames of reference • Modeling transformations • Instances • Picking • Flying • Scaling the VE • Collision detection Generic VR system: Introduction Virtual environment, Computer environment • VR technology • Model of interaction • VR Systems. | 06 |
| 03 | Visual Computation in Virtual Reality <ul style="list-style-type: none"> • Animating the Virtual Environment: Introduction The dynamics of numbers | 06 |

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|-----------|---|-----------|
| | <ul style="list-style-type: none"> • Linear and Nonlinear interpolation • The animation of objects • Linear and non-linear translation • Shape & object inbetweening • Free from deformation • Particle system. • Physical Simulation: Introduction • Objects falling in a gravitational field • Rotating wheels • Elastic collisions • Projectiles • Simple Pendulum • Springs • Flight dynamics of an aircraft | |
| 04 | Augmented and Mixed Reality <ul style="list-style-type: none"> • Taxonomy • Technology and features of augmented reality, Difference between AR and VR • Challenges with AR • AR systems and functionality • Augmented reality methods • Visualization techniques for augmented reality Wireless displays in educational augmented reality applications, • Mobile projection interfaces • Marker-less tracking for augmented reality Enhancing interactivity in AR environments Evaluating AR systems | 06 |
| 05 | Multiple Models of Input and Output Interface in Virtual Reality <ul style="list-style-type: none"> • Human factors: Introduction • The eye, the ear, the somatic senses. • VR Hardware: Introduction sensor hardware, Head-coupled displays, Acoustic hardware, Integrated VR systems. • VR Software: Introduction, Modeling virtual world, Physical simulation, • VR toolkits, Introduction to VRML, Input --Tracker, Sensor, Digital Glove, Movement Capture, Video-based Input, • 3D Menus & 3DScanner etc. Output --Visual /Auditory / Haptic Devices | 06 |
| 06 | Application of VR in Digital Entertainment <ul style="list-style-type: none"> • VR Technology in Film & TV Production. • Demonstration of Digital Entertainment by VR | 06 |

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: First Year
Revised syllabus to be implemented from Academic year 2020-2021
Credits: 02 each | Total Lectures 45
Subject: ANM- 402 3D Sculpting Tools & Techniques (Z-Brush)
Semester IV

| ANM- 402 3D Sculpting Tools & Techniques (Z-Brush) | | |
|---|--|-----------------|
| Semester IV | | |
| Chapter | Topic Name | Lectures |
| 1 | 1. ZBrush interface layout and Controls 1.1 Basics of sculpting 2. Working with canvas and documents 3. Menus: conventions and mouse buttons, Move scale and rotate buttons 1.4 Interface: Title bar, Palette buttons, Top-Left-Right shelf, LightBox, Z-script window 1.5 Working with Canvas and documents: Simple brush, quick pick brushes, Drag Rect and color spray strokes, MatCap Red Wax, Sketch Shaded, current color swatch, Ring 3D, 1.6 Brushes and Alpha: use of different types of Brushes and Alpha, Texture popup menus 1.7 Draw and Strokes: Alternate color swatches, draw size, focal shift, Rgb Intensity, and paint modes 1.8 Organizing files and path | 5 |
| 2 | Working with 3D-Ztools: Sculpt Dragon Head 2.1 working with Standard primitives and its parameters 2.3 working with polymesh 3D 2.4 Sculpt a Character Head using 3D sphere, dynamics buttons sculpting controls and symmetry settings and brush popup menu 2.5 Dynamesh and stretched polygons: importance of Dynamesh in resurfacing the model and procedure of usage. 2.6 Subdivisions: Active Points Total points polycount info. 7. Complete the Dragon head using various types of brushes, use of Lazy Mouse button | 10 |
| 3 | Detailing and Finework 3.1 Introduce different types of brushes, alpha and stamps according texture the model 3.2 Dynamesh project option 3.4 Brush alpha, brushstroke, Tool masking clear, Load brush to import new 3d party brush 3.5 Use of AutoMasking and BackFaceMask, transpose Move, rotate, scale tool 3.6 Create an eyeball using a sphere. 3.7 Model Tongue, Teeth and Horn 3.8 Wings and Muscles 3.9 Working with shadowbox | 7 |

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|---|---|---|
| | 3.10 Working with ZApplink | |
| 4 | Modeling with ZSphere chain 4.1 Basic parameters of Zsphere 4.2 Link or Bones 4.3 Transformation, child-parent, active skin, Density Slider 4.4 Preview Mesh, Adaptive skin 4.5 Sculpting with Dyna-mesh 4.6 Use of Clay Tube brush, DAM standard brush 4.7 Apply alpha on the skin 4.8 Adding claws with IMM Toon | 7 |
| 5 | Masking 5.1 Introduction Masking Menu 5.2 Use of Mask Pen, Mask Circle Mask Lasso Mask Curve and Mask Rect Brushes 5.3 Using the Graph with Mask by Cavity, Mask by smoothness, 5.4 Mask Peak and valleys, Mask by color Mask, ambient occlusion | 2 |
| 6 | working with UVs 6.1 Understanding Uvs 6.2 Map projection 6.3 create UVs in Zbrush using UV map palette 6.4 PUV tiles and settings 6.5 Save mask, create alpha and export to palette 6.6 Mask by alpha combine with cavity mask | 2 |
| 7 | Working with Material 7.1 Apply base color using standard brush 7.2 Use of Ambient occlusion Mask 7.3 Painting in the shadows using a standard brush and color spray stroke 7.4 Paint shades using smoothness mask 7.5 Painting and Inverting AO Mask 7.8 Introduce Decimation Master to reduce poly count or [Re-topology] | 3 |
| 8 | Props modelling using Ring 3D 8.1 Model collar using Tool geometry crease un crease 8.2 Geometry DelLower 8.3 Model a Fire Hydrant using cylinder 3D 8.4 Tool Polygroup Group by Normal and PolyF 8.4 Model Top and Bottom flange, Cap, Top Bolt 8.5 Model Water spouts, spout tips, Bottom, Base cutouts 8.6 Subtractive Dynamesh Boolean process 8.7 Model Base stand 8.8 Create Grass using Fibre Mesh | 5 |
| 9 | Posing and Lighting 9.1 Principles of posing and posing Techniques 9.2 Use of Transpose move or rotate tool according the pose 9.3 Adding lights Introduction of light Menu | 3 |

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| | 9.4 Turning the 3 Point lights on and it properties 9.5 Changing the color of the light | |
| 10 | Rendering 10.1 Introduction to ZBrush Render, BPR [Best Preview Render] 10.2 Render setting, Image Ratio, Pixel Resolution 10.3 Passes like Shadow, Ambient Occlusion, SSS 10.4 Document export and the BPR render pass 10.5 MatCap Shadow pass 10.6 Generating mask for Illustration 10.7 Adding layers | 3 |

Reference Books Getting Started ZBrush Author :Greg Johnson

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: Second Year
Revised syllabus to be implemented from Academic year 2020-2021
Credits: 02 each | Total Lectures 45
Subject: Game Design (Blender) ANM 403
Semester IV

| ANM- 403 Game Design (Blender) | | |
|---------------------------------------|--|-----------------|
| Semester IV | | |
| Chapter | Topic Name | Lectures |
| 1 | 1.1 Introduction To Blender Rendering, Material, Texturing, Lighting, Cameras, Real-Time Animation, Out-Put Basic Keys, commands and shortcuts 1.2 Interface Blender 3D The Blender Screen, Window Types, Customized or Readymade screens Open saving and appending files Working with Viewports 1.3 Creating and Editing objects Working with various types of meshes Using Main Modifiers to Manipulate Meshes, use of transform widgets, Edit mode Mesh editing, using of shading smooth-flat options and auto smooth, Extruding shape Using Subdivide and Proportional Editing to Create Ground | 5 |
| 2 | 2.1 Basic low-poly modelling of a Landscape Basic Modeling – Model light House using various Modeling commands, Joining/Separating Meshes and Boolean Operations, Add modifiers Boolean etc. Material and texturing all objects, Using Different types of maps Creating 3D cloud background and setting up environment Lighting Types and setting: Spot light for lighthouse, Indirect light setting Render setting for JPG and movie render output Ray-Tracing:Light and Shadows Reflection & Refraction | 4 |
| 3 | 3.1 Modeling LOW POLY for games Sci-Fi Pistol Modeling Pistol using modifiers, Adding Details,Texturing and Rendering SpaceCraft Adding Details, Material, Texture and Rendering | 5 |
| 4 | 4.1 Modeling a Human Character Reference Setting, Blocking, Add Detailing, UVW Map, Texture, Material and Render 4.2 Modeling an Animal Character Reference Setting, Blocking, Add Detailing, UVW Map, Texture, Material and Render | 5 |
| 5 | 5.1 Blender Basic Animation Basic Key-framing and Auto Key-framing, Action Editor, Dope sheet 5.2 Modifying Curves in the Graph Editor: Moving through timeline, Automatic Keyframing, Extrapolation | 4 |

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| 6 | 6.1 Generate Modifiers Array, Bevel, Booleans Build, Decimate, Edge split, Mask, Mirror, Multy resolution, screw, Solidify, Subdivision Surface 6.2 Deform Modifiers Armature, Cast, Curve, Displace, Hook, Mesh deforms, shrink wrap, simple deform, Smooth, Wave, Simulate Modifiers Cloth and Collision, Particle and Explode, fluid simulation, Soft body, Smoke | 3 |
| 7 | 7.1 Particle System Basic Setting, Emission, Cache, Velocity, Rotation, Physics Render Display, Children, Weights and force fields, Vertex Groups. 7.2 Simple Particle explosion (Fireworks) Interaction with Forces Using Particles and Vertex Groups for Hair and Grass Adding Rain to your Landscape | 3 |
| 8 | Working with Armature 8.1 Using Armature to Deform Meshes 8.2 Creating complex Armature Chains 8.3 Creating Bone Vertex Group 8.4 Using IK and Constraints 8.5 Creating a Skeleton 8.6 Creating a Mesh Shape key | 2 |
| 9 | Working with Nodes 9.1 Accessing Nodes 9.2 Using Nodes for Depth-Of-Field Camera Effects 9.3 Using Depth of Field | 2 |
| 10 | Game Engine Basics 10.1 Setting up the Physics Engine 10.2 Physics Panel 10.3 Scene Panel 10.4 Render Panel 10.5 Dynamics and Rigid Body Actions 10.6 Materials in the Game Engine 10.7 Using Game Physics in Animation 10.8 Using Logic Blocks and Construction 10.9 Setting the Actor 10.10 UV Texture Mapping | 10 |

Reference Book

Blender Basics classroom Tutorial Book 4th Edition Author: James Chronister
Blender 3D incredible machines Author: Christopher Kuhn

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: First Year
Revised syllabus to be implemented from Academic year 2020-2021
Subject: Animation for AR VR Techniques
Semester IV: Practical – ANM 404 – LAB

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: First Year
Revised syllabus to be implemented from Academic year 2020-2021
Subject: 3D Sculpting Tools & Techniques (Z-Brush)
Semester IV: Practical – ANM 405 – LAB

Practical: ANM 405

Based on ANM 402 for Fourth Term

30 HRS

1. Write and explain types of Traditional Sculpting, various types of tools to be used
2. Sculpt any 3 fruits using poly sphere
3. Sculpt any 3 Shields for Game weapon
4. Sculpt a warrior sword with detailed sculpting
5. Design and create warrior costume in ZBrush
6. Design and create a 3D character using Zsphere
7. Sculpt a realistic 3D Creature head including Jaw, Teeth, eyes.
8. Sculpt and texture a creature or super Hero character using Alpha with RGB colors, skins and IMM brushes
9. Model and Sculpt Metal Ornaments for Indian Mythological character using various sculpt tools e.g. Standard, Clay built-up Damm-standard etc. as well as self-created alphas and IMM brushes.
10. Render a full scene including characters, cloth, weapons, environment and all necessary stuff. Output in BPR Render

Students Should Present Journal of Basics of Photography at the end of the Semester.

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: Second Year
Revised syllabus to be implemented from Academic year 2020-2021
Subject: ANM- 406 Game Design (Blender)
Semester IV: Practical – ANM 406

| Practical: Game Design (Blender) | |
|---|---------------|
| Based on ANM 403 for Fourth Term | 30 HRS |
| Use low-poly modeling techniques for these practicals, so that the models can perform better when imported in the game engine. | |
| 1. Model at least five 3D Props for Game Interior scene | |
| 2. Model 3D Exterior scene, old House or building. | |
| 3. Create 3D Landscape scene BG for game environment | |
| 4. Design and model at least 3 Game Weapons | |
| 5. Design and Model Robotic character | |
| 6. Design and Model Mythological character | |
| 7. Create Cloth Simulation: Flag | |
| 8. Simulate Hair style for your Game character | |
| 9 Rig and Animate your Game character | |
| 10 Create Water simulation: Ocean with floating Boat | |
| Student Should Present Journal of Game Design Practical at the end of the Semester. | |

Savitribai Phule Pune University, Pune
Course Name: B. Sc. Animation Class: S. Y.
Revised syllabus to be implemented from Academic year 2022-2023
Credits: 04
SUBJECT: Character Animation
Semester II

| ANM 407 Character Animation | | |
|------------------------------------|--|-----------------|
| Chapter | Topic Name | Lectures |
| 1 | Unit I The Construction of a simple character <ul style="list-style-type: none"> • The spine • Rib Cage • The pelvic Girdle • The Skull the Shoulder • Joints • What is Exposure sheet? • Making your Character ready • Checking the Mesh flow of the character. • Studying Gravity and Balance | 7 |
| 2 | Unit II Get your character rigged <ul style="list-style-type: none"> • Introduction • Defining good orientations for your bones • Using separate bone chains for different tasks • Customizing shapes and colors for your bones • Using corrective shape keys • Making an IK-FK switcher • weight painting your character • Rigging the Torso • How to create a stretchy spine • Rigging the pelvis • Making your character breathe • Controlling the neck and head • Graph Editor | 10 |

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|---|--|----|
| 3 | <p>Unit III Hand and leg Controllers</p> <ul style="list-style-type: none"> • The Limbs Controllers • Setting up the shoulders • Controlling fingers • Creating IK legs with a three-pivot foot • Cartoon bending for arms and legs • Different spaces for IK hands • Blending with the Animation Workflow • Animating in layers • Changing between FK and IK in a shot • Grasping and throwing objects • Hand gestures • Tracking animation arcs • Non-linear animation | 10 |
| 4 | <p>Unit IV Facial Rigging</p> <ul style="list-style-type: none"> • Adding expressions using Shape Keys • Face controls with lattices • Animating Mouths with Blend Shapes in Maya Creating the jaw controller • Eye Animation • Introduction • How to control where your characters look at • The eyelids controllers • Controlling the pupils • Lip Sync • Mouth Shapes • Mouth Shut consonants • Vowels • Recording and Breaking Down a Dialog Track • Animating the Stick and String | 10 |
| 5 | <p>Unit V</p> <ul style="list-style-type: none"> • Adjusting and tracking the timing • Spacing: favouring and easing poses • Anticipating an action • Using squash and stretch • Animating two or more characters. • The lift exercise in 3D • Dive exercise in Maya. • Using video for background reference • Working with linked assets and characters • Animation of Animal • Walks and Runs of Animal • Animation of Birds | 8 |

Reference Books:

- Character Animation Fundamentals Developing Skills for 2D and 3D Character Animation- Steve Roberts

- Blender 2.5 Character Animation Cookbook - Virgilio Vasconcelos