Ahmednagar Jilha Maratha Vidya Prasarak Samaj's

New Arts, Commerce and Science College, Ahmednagar (Autonomous)

(Affiliated to Savitribai Phule Pune University, Pune)

Choice Based Credit System (CBCS)

Bachelor of Science (B. Sc.)

Syllabus of

S. Y. B. Sc. Animation

Implemented from

Academic Year 2022 - 23

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's

New Arts, Commerce and Science College, Ahmednagar (Autonomous)

Board of Studies in Animation

Sr. No.	Name	Designation
1.	Prof. Santosh M Thube	Chairman
2.	Dr. Yogesh Deshpande	Academic Council Nominee
3.	Dr. Pallavi S Meshram	Academic Council Nominee
4.	Dr. Sameer S Sahasrabudhe	Vice Chancellor Nominee
5.	Mr. Deepak N Chaudhari	Alumni
6.	Prof. Binoj V John	Industry Expert
7.	Prof.Manohar B Gobare	Member (co-opt)
8.	Prof.Sameer S Nerlekar	Member (co-opt)
9.	Prof.Madhura M Khoje	Member (co-opt)

3. Programme Structure and Course Titles: (All academic years)

Sr. No.	Class	Semester	Course Code	Course Title	Credits
1.	F. Y. B. Sc.	I	BSC-AN 101 T	Basics of Animation-I	02
2.	F. Y. B. Sc.	I	BSC-AN 102 T	Foundation of Art	02
3.	F. Y. B. Sc.	I	BSC-AN 103 T	Digital Graphics-I	02
4.	F. Y. B. Sc.	I	BSC-AN 104 T	Programming Languages-I	02
5.	F. Y. B. Sc.	I	BSC-AN 105 T	3D Visualization-I	02
6.	F. Y. B. Sc.	I	BSC-AN 106 T	Information Technology-I	02
7.	F. Y. B. Sc.	I	BSC-AN 107 T	Creative Writing	02
8.	F. Y. B. Sc.	I	BSC-AN 108 T	Art in Game	02
9.	F. Y. B. Sc.	I	BSC-AN 109 P	Foundation of Art	1.5
10.	F. Y. B. Sc.	I	BSC-AN 110 P	Programming Language-I	1.5
11.	F. Y. B. Sc.	I	BSC-AN 111 P	3D Visualization-I	1.5
12.	F. Y. B. Sc.	I	BSC-AN 112 P	Digital Graphics I	1.5
13.	F. Y. B. Sc.	II	BSC-AN 201 T	Basics of Animation-II	02
14.	F. Y. B. Sc.	II	BSC-AN 202 T	Digital Filmmaking	02
15.	F. Y. B. Sc.	II	BSC-AN 203 T	Digital Graphics-II	02
16.	F. Y. B. Sc.	II	BSC-AN 204 T	Programming Languages-II	02
17.	F. Y. B. Sc.	II	BSC-AN 205 T	3D Visualization-II	02
18.	F. Y. B. Sc.	II	BSC-AN 206 T	Stop Motion Animation	02
19.	F. Y. B. Sc.	II	BSC-AN 207 T	2D Animation	02
20.	F. Y. B. Sc.	II	BSC-AN 208 T	Typography	02
21.	F. Y. B. Sc.	II	BSC-AN 209 P	Stop motion and C#	1.5
22.	F. Y. B. Sc.	II	BSC-AN 210 P	2D Animation	1.5
23.	F. Y. B. Sc.	II	BSC-AN 211 P	3D Visualization-II	1.5
24.	F. Y. B. Sc.	II	BSC-AN 212 P	Digital Graphics-II	1.5
25.	S. Y. B. Sc.	III	BSC-AN 301 T	3D Production-I	02

26.	S. Y. B. Sc.	III	BSC-AN 302 T	Animation Technique	02
27.	S. Y. B. Sc.	III	BSC-AN 303 T	Graphics Arts	02
28.	S. Y. B. Sc.	III	BSC-AN 304 T	Digital Technologies	02
29.	S. Y. B. Sc.	III	BSC-AN 305 T	Production Process	02
30.	S. Y. B. Sc.	III	BSC-AN 306 T	Audio Production	02
31.	S. Y. B. Sc.	III	BSC-AN 307 P	Animation Technique & Audio Production	02
32.	S. Y. B. Sc.	III	BSC-AN 308 P	3D Production-I	02
33.	S. Y. B. Sc.	III	BSC-AN 309 P	Graphics Arts	02
34.	S. Y. B. Sc.	III	BSC-AN 310 T	Critical Thinking and Scientific Temper	02
35.	S. Y. B. Sc.	III	BSC-AN 311 T	English / Hindi Communication	02
36.	S. Y. B. Sc.	III	BSC-AN 312 T	Advance Anatomy	02
37.	S. Y. B. Sc.	III	BSC-AN 313 P	Advance Anatomy (Practical)	02
38.	S. Y. B. Sc.	IV	BSC-AN 401 T	3D Production-II	02
39.	S. Y. B. Sc.	IV	BSC-AN 402 T	Motion Graphics	02
40.	S. Y. B. Sc.	IV	BSC-AN 403 T	Web Development	02
41.	S. Y. B. Sc.	IV	BSC-AN 404 T	Augmented and Virtual Reality	02
42.	S. Y. B. Sc.	IV	BSC-AN 405 T	Animation Film and Process	02
43.	S. Y. B. Sc.	IV	BSC-AN 406 T	Digital Photography	02
44.	S. Y. B. Sc.	IV	BSC-AN 407 P	Motion Graphics & Digital Photography	02
45.	S. Y. B. Sc.	IV	BSC-AN 408 P	3D Production-II	02
46.	S. Y. B. Sc.	IV	BSC-AN 409 P	Web Development	02
47.	S. Y. B. Sc.	IV	BSC-AN 410 T	Environmental Awareness	02
48.	S. Y. B. Sc.	IV	BSC-AN 411 T	English/Hindi Communication	02
49.	S. Y. B. Sc.	IV	BSC-AN 412 T	2D Digital Character Animation	02
50.	S. Y. B. Sc.	IV	BSC-AN 413 P	2D Digital Character Animation (Practical)	02
51.	T. Y. B. Sc.	V	BSC-AN 501 T	User Interface	02
52.	T. Y. B. Sc.	V	BSC-AN 502 T	Game Design	02

53.	T. Y. B. Sc.	V	BSC-AN 503 T	Visual Effect-I	02
54.	T. Y. B. Sc.	V	BSC-AN 504 T	Advanced Programming	02
55.	T. Y. B. Sc.	V	BSC-AN 505 T	Script Writing	02
56.	T. Y. B. Sc.	V	BSC-AN 506 T	Digital Editing-I	02
57.	T. Y. B. Sc.	V	BSC-AN 507 P	User Interface and Advanced Programming	02
58.	T. Y. B. Sc.	V	BSC-AN 508 P	Game Design	02
59.	T. Y. B. Sc.	V	BSC-AN 509 P	Visual Effects & Digital Editing-I	02
60.	T. Y. B. Sc.	V	BSC-AN 510 T	3D Character Animation	02
61.	T. Y. B. Sc.	V	BSC-AN 511 P	3D Character Animation (Practical)	02
62.	T. Y. B. Sc.	VI	BSC-AN 601 T	IPR & Cyber Security	02
63.	T. Y. B. Sc.	VI	BSC-AN 602 T	Game Production	02
64.	T. Y. B. Sc.	VI	BSC-AN 603 T	Visual Effects-II	02
65.	T. Y. B. Sc.	VI	BSC-AN 604 T	Concept Development	02
66.	T. Y. B. Sc.	VI	BSC-AN 605 T	Media Communication	02
67.	T. Y. B. Sc.	VI	BSC-AN 606 T	Digital Editing-II	02
68.	T. Y. B. Sc.	VI	BSC-AN 607 P	Game Production	02
69.	T. Y. B. Sc.	VI	BSC-AN 608 P	Visual Effects and Digital Editing-II	02
70.	T. Y. B. Sc.	VI	BSC-AN 609 P	Internship	02
71.	T. Y. B. Sc.	VI	BSC-AN 610 T	Digital Painting & Illustration	02
72.	T. Y. B. Sc.	VI	BSC-AN 611 P	Digital Painting & Illustration (Practical)	02

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Syllabus of S. Y. B. Sc. Animation
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Semester – III	**Paper – I**
Course Code: BSC-AN 301 T	**Title of the Course: 3D Production-I**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. This course introduces students to all the features of Maya.
b. Introduction, Modelling, Texturing, Rendering and popular workflow.
c. Study of Rigging, Dynamics and FX is included.

Detailed Syllabus:

Unit I: Interface Autodesk Maya (03 Lectures)

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

Unit II: Character Modeling (08 Lectures)

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

Unit III: Texturing Lighting Arnold Renderer (04 Lectures)

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

Unit IV: Rigging and Muscle Systems **(03 Lectures)**

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
4.7 Quick Rig – Auto rig and step-by-step method
4.8 The Maya Muscle System
Understanding the Maya Muscle System
Create Muscles Using the Muscle Builder
Editing Muscle Parameters, Converting the Smooth Skin to a Muscle System, Sliding Weights

Unit V: Animation Techniques **(04 Lectures)**

5.1 Understanding Animation Principles
5.2 Body language and Acting
5.3 Key frame Animation, Creating Key frames
Auto Key frame, Moving and Scaling Key frames on the Timeline
5.4 Play-blast and F-Check
5.5 Driven Keys: Creating a Driven Key Looping Driven Keys, Copying and Pasting Driven Keys, Constrains
5.6 Walk Cycle, Run cycle Jump cycle
5.7 Animate Character, throwing a ball
5.8 Moving object using Path constraint

Unit VI: Rendering for Compositing **(04 Lectures)**

6.1 Render Layers
Creating Render Layers, Render Layer Overrides,
Creating Overrides for Rendering Cameras, Material Overrides Render Layer Blend Modes,
6.2 Render Passes
Upgrading Materials for Rendering Passes,
Rendering Multiple Passes from a Single Render Layer
Creating an Ambient Occlusion Render Pass
6.3 Setting up a Render with Arnold

Specifying Frame Range, Renderable Cameras
File Formats and the Frame Buffer, Starting a Batch Render
Command-Line Rendering

Unit VII: Maya FX, Dynamics **(06 Lectures)**

7.1 Creating nCloth Objects
Making a Polygon Mesh Dynamic Bedsheet
Applying nCloth Presets, Making Surfaces Sticky
Creating nConstraints, making nCloth Objects Expand Using Pressure, Additional Techniques, Creating an nCache
7.2 Creating nCloth Flag simulation
7.3 Rigid Body Dynamics: Animate a Ball hits the stumps
7.4 Maya Motion graphics with Mash: Create a metallic chain using Maya Mash network and Mash editor
7.5 Create a Perl Necklace using MASH
7.6 Create a Rope or thread wire-using MASH

Unit VIII: XGen **(04 Lectures)**

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

Unit IX: Maya Bifrost **(04 Lectures)**

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

Suggested Readings:

1. Mastering Autodesk Maya 2015, Author - Todd Palmar
2. Maya 2017 Bifrost Liquid Author: Wanho Choi
3. Autodesk Maya 2020 Documentation

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Semester – III	**Paper – II**
Course Code: BSC-AN 302 T	**Title of the Course: Animation Technique**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. Studying Adobe After effects Software

b. Study of Compositing CGI Elements

c. Understanding Particle System

Detailed Syllabus:

Unit I: About the After Effects **(8 Lectures)**

1.1 After effects Interface
1.2 Layers
1.3 Key frames
1.4 Animating the composition

Unit II: Chroma Mattes and Clean Plate **(12 Lectures)**

2.1 Digital Matting Methods and Tools, Basic Shooting Setup

2.2 Compositing Technique

2.3 Wire Removing in After Effect

2.4 Create BG Plates

2.5 Removing Characters from BG Plates

Unit III: Masking & Stereoscopy **(10 Lectures)**

3.1 Origins of Roto Key Framing Techniques

3.2 Creating Spline

3.3 Depth Creation with Mask.

3.4 Monoscopic to Stereoscopic Conversion

Unit IV: Advanced Editing Technique **(5 Lectures)**

4.1 Using Warp Stabilizer

4.2 Using multipoint tracking.

4.3 Mocha for After Effects

Unit V: Particle Simulation **(5 Lectures)**

5.1 Creating a particle simulation

5.2 Understanding Particle Systems II properties

5.3 About high dynamic range (HDR) footage

Suggested Readings:

1. The Green Screen Handbook (Jeff Foster)

2. The Visual Effects Arsenal (Bill Byrne)

3. Rotoscoping Techniques & Tools (Benjamin Bratt)

4 Adobe After Effects CC Classroom in a Book® (2017 Release

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Semester – III	**Paper – III**
Course Code: BSC-AN 303 T	**Title of the Course: Graphics Arts**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. Understanding the designing of Book, Magazines and different graphics media.
b. Understanding how to upload your interactive graphic work online.
c. Understanding different aspects of Type and Master Pages.
d. Designing different Medias using the learned software.

Detailed Syllabus:

Unit I: Introduction (02 Lectures)

- Scope for Graphic Design in Industry.
- Introduction to workspace
- Customizing the workspace
- Working with panels – Tools panel, Application Panel.
- Using context menus

Unit II: Setting up New Document, what are mater pages? (03 Lectures)

- Getting started
- Creating a new Document
- Printing to the edge of the paper: using the bleed.
- Adding new pages to the document
- Changing the size of pages within the pages
- Using Guides - adding, deleting guides.
- Master pages
- Placeholder master
- Applying master and overriding master

Unit III: Working with Objects (02 Lectures)

- Working with layers - Layers panel,
- Creating Graphics frame – Placing Graphics in graphic frame, Resizing graphic, placing multiple graphic.

- Adding metadata
- Linking graphic
- Parent-Child graphic frame
- Text Wrap - Intelligent subject detection
- Compound Shapes
- Repeating Shapes
- Rotating and Aligning Objects
- Converting Shapes
- Aligning multiple objects
- Generating QR code

Unit IV: Importing and Editing Text **(02 Lectures)**

- Text frames- Resizing, Reshaping Multi column
- Managing fonts
- Adding Text
- Typing and Styling Text
- Aligning text
- Threading text
- Changing number of columns
- Changing text alignment
- Text on a path

UNIT V: Typography **(03 Lectures)**

- What is Typography**?**
- Point Size.
- Paragraph Setting.
- Vertical spacing
- Font and type style
- Paragraph alignment
- Special font features and drop cap
- Adding a special character
- Applying a stroke and fill to text
- Inserting fraction characters
- Specifying columns for a text frame
- Creating a straddle head
- Adjusting columns
- Hanging punctuation outside the margin
- Creating a drop cap
- Adjusting letter and word spacing
- Adjusting the tracking and kerning
- Hyphenation settings
- Setting tabs

- Creating a numbered list with a hanging indent

Unit VI: Working with color (03 Lectures)

- Displaying color at full range.
- Adding color to swatch palette
- Applying color to objects
- Dash stroke
- Gradient
- Tint
- Apply color to text
- Apply color to object
- Creating and applying gradient swatch
- Creating a color theme
- Viewing color themes
- Adding a theme to the Swatches panel

Unit VII: Working with Styles (04 Lectures)

- Creating and applying paragraph styles
- Creating and applying character styles
- Nesting character styles inside paragraph styles
- Creating character styles for nesting
- Creating object styles
- Formatting an object for a style
- Creating and applying table and cell styles
- Creating cell styles
- Creating a table style
- Globally updating styles
- Loading styles from another document

Unit VIII: Importing and linking graphics (04 Lectures)

- Adding graphics
- Vector and bitmap graphics
- Managing links to imported graphics
- Updating graphics
- Clipping paths
- Library to manage objects
- Adding graphics from other programs
- Viewing information about linked files
- Showing files in Explorer (Windows)
- Place a graphic into an existing frame and use frame fitting options
- Working with dropped backgrounds
- Working with clipping paths from other software.

- Working with transparent backgrounds from ny other software
- Working with a file with layers
- Creating an anchored graphics frame
- Adding text wrap to an anchored graphics frame
- Importing an Illustrator file
- Importing an Illustrator file with layers

Unit IX: Creating Table (03 Lectures)

- Creating a table
- Converting text to a table
- Changing rows and columns
- Adding and deleting rows
- Adjusting column widths, row heights, and text placement
- Formatting a table
- Adding graphics to table cells
- Converting cells to graphic cells
- Placing images in graphic cells
- Adjusting the row heights
- Anchoring graphics in table cells
- Creating a header row
- Creating and applying table and cell styles
- Creating table and cell styles
- Applying table and cell styles

Unit X: Working with Effects Panel (03 Lectures)

- Importing and colorizing a grayscale image
- Applying transparency settings
- About the Effects panel
- Applying a blending mode
- Importing and adjusting Illustrator files that use transparency
- Applying a basic feather to the edges of an image
- Applying a gradient feather
- Adding a drop shadow to text
- Applying multiple effects to an object
- Copying effects between objects
- Editing and removing effects

Unit XI: Printing and Exporting (03 Lectures)

- File Type
- Colors, Previewing separations
- Resolution
- Bleed Measurement
- Printer Markers

- Print Ready Design
- Pre flighting files
- Managing colors
- Using the Ink Manager
- Creating an Adobe PDF proof
- Creating a press-ready PDF and saving a PDF preset
- Print Booklet
- Packaging files

Unit XII: Creating Adobe PDF Files with Form Fields (05 Lectures)

- Set up a workspace for forms
- Adding form fields
- Adding text fields
- Adding either/or choices: radio buttons
- Adding yes or no choices: check boxes
- Adding a list of choices: combo box
- Setting the tab order of the fields
- Adding a button to submit the form
- Exporting an interactive Adobe PDF file
- Testing your form in Adobe Acrobat Reader

Unit XIII: Creating a fixed-Layout epub (05 Lectures)

- Getting started
- Creating a new document for fixed-layout export
- EPUB: Reflow able versus fixed-layout
- Adding animation
- Using a motion preset to create animation
- Adjusting the timing of animations
- Buttons
- Using buttons to play animations
- Using a button to trigger custom motion paths for animations
- Creating a navigation button
- Creating a pop-up caption
- Adding multimedia and interactive elements
- Adding a movie
- Adding a sound
- Creating a slideshow
- Creating a hyperlink
- Exporting an EPUB file
- Timing animations
- Adding sound control buttons
- Creating a slide-in caption

Suggested Readings:

1. Reference Book: Adobe InDesign CC Classroom in a book (2020 release)

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Semester – III	**Paper – IV**
Course Code: BSC-AN 304 T	**Title of the Course: Digital Technologies**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

After successfully completed course, students will be able to:

1. **Describe the types of media and define multimedia system.**
2. **Describe the process of digitizing of different analogue signals (text, graphics, sound and video).**
3. **Use and apply tools for image processing, video, sound and animation.**

Detailed Syllabus:

Unit I: Introducing Multimedia & Multimedia information (08 Lectures)

1.1-Introduction

1.2 Multimedia Today

1.3 Future of Multimedia

1.4 Elements of Multimedia

1.5. What is multimedia?

1.6. Early Hypertext and Collaborative Research

1.7. Multimedia and personalized computing

1.8. Multimedia on the Map

1.9. Multimedia System: The challenges

Unit II: The convergence of Computers, communication and entertainment Products. (08 Lectures)

2.1 Technology Trends

2.2 Multimedia Appliances: Hybrid Devices

2.3 A designer's view of Multimedia Appliances

2.4 Industry Perspectives for the next decade

Unit III: Digital Audio Representation and Processing **(07 Lectures)**

3.1 Uses of Audio in computer applications

3.2 Psychoacoustics

3.3 Digital Representations of sound

3.4 Transmission of digital sound

3.5 Digital Audio signal Processing

3.6 Digital music making

Unit IV: Video Technology **(06 Lectures)**

4.1 Sensors for TV Cameras

4.2 Color Fundamentals

4.3 Color Video

4.4 Video Performance Measurements

4.5 Video Equipment

Unit V: Digital Video and Image Compression **(06 Lectures)**

5.1 Evaluating a compression System

5.2 Redundancy and Visibility

5.3 Video compression techniques

5.4 Standardization of algorithms

5.5 The JPEG Image compression standards

5.6 The MPEG Motion Video Compression Standards

5.7 DVI Technology

Unit VI: Multimedia Interchange (05 Lectures)

7.1 QuickTime Movie File (QMF) format

7.2 OMFI

7.3 MHEG (Multimedia and Hypermedia Information Encoding Expert Group)

7.4 Track model and object model

7.5 Real-Times Interchange

Suggested Readings:

1. Multimedia in Practice (PEARSON) –Jeffcoate.
2. Multimedia Systems (PEARSON) –John F.Koege Buford
3. Multimedia Computing Communication and Application -Steinmetz

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Semester – III	**Paper – V**
Course Code: BSC-AN-305 T	**Title of the Course: Production Process**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. Through this course students can learn what are the basics for developing a animation short film or real time film. Participate in the planning and implementation of animation projects.

b. Understanding the concepts of storyboarding and its details. Apply performance theory to the creation of animation.

c. Produce layouts and backgrounds with attention to composition, perspective and color.

Detailed Syllabus:

Unit I: Introduction to Production Process (05 Lectures)

- What is Production Process?
- What is Production Pipeline?
- Three steps of Production Pipeline (Pre-Production, Production, and Post Production)

Unit II: Pre-Production- (08 Lectures)

- The Idea and Story-
- How to develop a story?
- Where Do Ideas Come From?
- The Script ,
  Script Terms
  - (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
- Script Writing software

Unit III: Developing Script for Animation (05 Lectures)

- The 3-D Script vs. the 2-D Script
- Theatrical
- Direct-to-video
- Television
- Television Animation and Feature Animation

Dialogue

- The Purpose of Dialogue
- Revealing Character
- Moving the Story Along with Dialogue
- Characteristics of Dialogue

Unit IV: Visual Development (03 Lectures)

- Concept Art or Production Design (Three types of Concept Arts)

Unit V: Character Design and Background design (05 Lectures)

- Types of People
- Anthropomorphism
- Personality
- Appeal
- Character Bible and Design
- Different types of Characters- Male, female, children
- Character Proportion

- Character Construction
- Costume
- Drawing for Character (Character Model Sheets, Props.)

Unit VI: Character Design and Background design (07 Lectures)

- Types of People
- Anthropomorphism
- Personality
- Appeal
- Character Bible and Design
- Different types of Characters- Male, female, children
- Character Proportion
- Character Construction
- Costume
- Drawing for Character (Character Model Sheets, Props.)

What is Reference Map? Research –BG, Colour, Composition etc….

Unit VII: Storyboards (07 Lectures)

Story Board Elements,

- 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

Digital Storyboarding

- The Conventions of the Cinema for storyboarding.
- Animatic

Suggested Readings:

Reference Links

https://www.masterclass.com/articles/what-is-concept-art

https://dreamfarmstudios.com/blog/3d-animation-pipeline/

Reference Books

1. Animation Writing Development Script Pitch by Jean Ann Wright – Focal Press
2. Professional Storyboarding_ Rules of Thumb by Sergio Paez and Anson Jew
3. Writing for Animation, Comics, and Game by Christy Marks – Focal Press
4. Animation - From Concept to Production by Hannes Rall - CRS Press
5. The Fundamentals of Animation by Paul Wells and Samntha Moore - Bloomsbury Publication

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Semester – III	**Paper – VI**
Course Code: BSC-AN 306 T	**Title of the Course: Audio Production**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. Studying Adobe Audition Software

b. Study of Audio Compositing.

c. Understanding Audio Basics.

Detailed Syllabus:

Unit I: Audio Interfacing **(04 Lectures)**

1.1. Audio Basics
1.2. Using external interfaces
1.3. The Audition Workspace

Unit II: Basic Editing **(10 Lectures)**

2.1. Opening a file for editing
2.2. Selecting a region for editing and changing its level
2.3. Cutting, deleting, and pasting audio regions
2.4. Cutting and pasting with multiple clipboards
2.5. Extending and shortening musical selections
2.6. Simultaneous mixing and pasting
2.7. Repeating part of a waveform to create a loop
2.8. Showing waveform data under the cursor
2.9. Fading regions to reduce artifacts

Unit III: Signal Processing

3.1. Effects basics, using the Effects Rack

3.2. Amplitude and Compression effects

3.3. Delay and echo effects

3.4. Filter and EQ effects

3.4. Modulation effects

3.5. Noise reduction/restoration

3.6. Reverb effects

3.7. Special effects

3.8. Stereo imagery effects

3.9. Time and Pitch effect

Unit IV: Audio Restoration **(08 Lectures)**

4.1. About audio restoration

4.2. Reducing hiss

4.3. Reducing crackles

4.4. Reducing pops and clicks

4.5. Reducing broadband noise

4.6. De-humming a file

4.7. Removing artifacts

4.8. Manual artifact removal

4.9. Alternate click removal

4.10. Sound removal

Unit V: Sound Design **(10 Lectures)**

5.1. About sound design

5.2. Creating rain sounds

5.3. Creating a babbling brook

5.4. Creating insects at night

5.5. Creating sci-fi machine effects

5.6. Creating an alien drone flyby

5.7. Extracting frequency bands

Unit VI: Mixing **(08 Lectures)**

6.1. About mixing

6.2. Testing your acoustics

6.3. The mixing process

6.4. Exporting a stereo mix of the song

Suggested Readings:

1. Adobe Audition CC Classroom in a Book - Maxim Jago (Author)

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Semester – III	**Paper – VII**
Course Code: BSC-AN 307 P	**Title of the Course: Animation Technique and Audio Production**
Credits: 02	**Total Lectures: 45 Hrs.**

Course Outcomes (COs):

a. Studying Adobe After effects Software

b. Study of Compositing CGI Elements

c. Understanding Particle System

Practical List:

1. Remove a green Screen, Remove unwanted parts using Rotoscoping and composite with proper background and color Correction.
2. I) Track a motion and add an elements or Text.
   II) Replace a screen using 4 point Tracking.
3. Create a various effects using Particle Systems.
4. Create a 3D Title Using element 3D (Plug in).
5. Compose a scene using (CGI) Cinema 4D or Element 3D (Plug in).
6. Record and Edit Music
7. Remix Music to fit Your Video
8. Set Up multitrack Se up
9. Remove Noise from Audio Files & Repair and restore audio
10. Use Stereo Expander Effects

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Semester – III	**Paper – VIII**
Course Code: BSC-AN 308 P	**Title of the Course: 3D Production-I**
Credits: 02	**Total Lectures: 45 Hrs.**

Course Outcomes (COs):

a. This course introduces students to all the features of Maya.
b. Introduction, Modelling, Texturing, Rendering and popular workflow.
c. Study of Rigging, Dynamics and FX is included.

Practical List:

1. Create Realistic 3D Interior scene, which is render using Arnold Maya.

2. Create and render 3D Village scene and render with Arnold and HDRI

3. Model a Car, Texture and render with Arnold

4. Model a 3D cartoon Character (any from TV Series)

5. Rig, skin and weight a cartoon 3D character

6. UVW unwrap and texture (with Photoshop) 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

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Semester – III	**Paper – IX**
Course Code: BSC-AN 309 P	**Title of the Course: Graphics Arts**
Credits: 02	**Total Lectures: 45 Hrs.**

Course Outcomes (COs):

a. Understanding the designing of Book, Magazines and different graphics media.
b. Understanding how to upload your interactive graphic work online.
c. Understanding different aspects of Type and Master Pages.
d. Designing different Medias using the learned software.

Practical List:

1. Newspaper Layout
2. Logo Design, Business Card Design, Letterhead and Envelope Design.
3. Magazine Front Page Design or Magazine Inner Page Design
4. Newspaper Advertisement
5. Menu Card Design
6. Music CD Sticker, CD cover & CD Carton design.
7. Design a 15 page Informative Book (e.g. City Guide, Product guide etc.)
8. Design Award Certificate or a Pamphlet Design
9. Bifold or Trifold Brochure Design
10. Design an E-book using ePUB Format.

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Semester – III	**Paper – XII**
Course Code: BSC-AN 312 T	**Title of the Course: Advance Anatomy**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. Character Designing
b. Modeling, Sculpting, Rigging, Lip-sync Synchronization, Jaw Movements, Facial Expressions & Animation.
c. Will be Useful in Medical Graphics, Medical Animation, and Medical Products & Medical Study Reference Videos etc.
d. Advertisement Industry (For Example:- Toothpaste & Toothbrush, Nasal Spray, Cough Syrup, Headache, Cosmetics, Anti Acidity Products, Digestive System, Health related Products, Body-Muscles & Joint Pain Products etc.)

Detailed Syllabus:

Unit I: SKELETAL SYSTEM (07 Lectures)

1.1 Introduction to Basic Human Proportions

1.2 Introduction to Bones (Skull, Jaw Bone, Vertebrae Column (Spinal Cord, Bone Quantity), Rib Cage etc.)

Arm: - Shoulder, Scapula, Humerus, Radius, Ulna, Wrist, Palm & Finger Bones.

Leg: - Femur, Patella, Tibia, Fibula, Feet & Finger Bones.

1.3 Type of Bones (Flat, Long, Short, Irregular & Sesamoid Bone)

1.4 Functioning of Bones

1.6 Characteristics of Bones (Smallest, Largest & Strongest etc.)

1.7 Various Joints (Hip, Knee, Ankle, Wrist, Shoulder & Elbow)

(Six Types of Joint:- Ball & Socket (Hip & Shoulder), Saddle (Carpal Bone of Thumb & Tarsal bone of Feet), Hinge (Ankle, Elbow & Knee), Condyloid (Wrist:- 360^0), Pivot (Neck Bone) & Gliding Joint (Ankles, Wrist & Spine etc.)

Unit II: HUMAN MUSCLES (07 Lectures)

2.1 Facial Muscles (Useful for Facial Expressions)

a. Buccolabial Muscles in and around Mouth.

b. Nasal Muscles around Nose.

c. Epicranial Muscles of Forehead, Skull & Neck.

d. Auricular Muscles around Ears.

e. Orbital Muscles surrounding Eyes.

2.2 Chest Muscles, Stomach Muscles & Back Muscles

2.3 Hands & Arms Muscles (Biceps, Brachialis & Triceps)

2.4 Feet & Legs Muscles (Rectus Femoris, Vastus Lateralis-Medialis-Intermedius)

Unit III: HUMAN BODY SYSTEMS (10 Lectures)

3.1 Respiratory System:-

Parts of the System: - Nose, Mouth, Throat, Voice Box, Windpipe, Large Airways, Small Airways & Lungs & Functioning.

3.2 Blood Circulation System:-

a. Heart: - Pump

b. Blood Vessels: - Transport Organs (RBC & WBC)

c. Blood: - Transport Fluid

d. Lymphatic System: - Defense System & Functioning.

3.3 Digestive System:-

a. Parts: - Mouth, Esophagus, Stomach, Pancreas, Liver, Gall bladder, Small Intestine, Large Intestine & Anus.

b. Functioning: - Motility, Digestion, Absorption & Secretion.

3.4 Excretory System:-

a. Parts: - Sweat Glands, Liver, Lungs & Kidney system.

b. Products: - Amino Acids, Urea, Uric Acid, Carbon Dioxide, Water & Ammonia.

c. Functioning: - Collect Water, Filter Body Fluids, Remove & Concentrate waste products & return substances & Eliminate excretory products from the body.

Unit IV: HUMAN HEART (04 Lectures)

4.1 Introduction to Human Heart (Location, Size, Shape & Weight).

4.2 Functioning (Blood Purification, Maintaining Blood Pressure, Cardiac Cycle, Myogenic: - Heart Contraction & Relaxation etc.)

4.3 Structure (4 Chambers (Atrial-Ventricles) Pure–Impure Blood Storage, Introduction to SV-AV Nodes, and Veins & Arteries in Heart).

Unit V: HUMAN BRAIN (04 Lectures)

5.1 Introduction to Human Brain (Fore Brain, Mid Brain & Hind Brain)

5.2 Functioning (Voluntary & Involuntary Movements, Maintain Body Balance, Functioning of Right & Left Brain).

5.3 Central & Peripheral Nervous System (CNS & PNS).

5.4 Types of Nerves (Afferent, Efferent & Association Neurons).

Unit VI: HUMAN EARS (04 Lectures)

6.1 Introduction to Human Ears

6.2 Sound Generation & Ears' Functioning.

6.3 Bones in Ears (Soft Bones)

6.4 External, Middle & Internal Structure of Ears.
(Middle Ear: - Ear Drum, Malleus, Incus & Stapes (Ear Ossicles).
(Internal Ear: - Semicircular Canals & Cochlea).

Unit VII: HUMAN EYES (04 Lectures)

7.1 Functions of Human Eyes (Light Detection, Night Vision, Focus, Depth Perception & Balance etc.)

7.2 Parts of Eyes (Cornea, Iris, Retina, Pupils, Eye Lens, Ciliary Muscle, Rod Cells, Cone Cells & Blind Spot etc.)

7.3 Image Generation.

Suggested Readings:

1. General Science by Dr. Sachin Bhaske.

2. Competitive Science by Dr. Anil Kolte.

3. Maharashtra State Board Syllabus (8^{th} Standard to 12^{th} Standard).

4. NCERT Science Books.

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Semester – III	**Paper – XIII**
Course Code: BSC-AN 313 P	**Title of the Course: Advance Anatomy (Practical)**
Credits: 02	**Total Lectures: 45 Hrs.**

Course Outcomes (COs):

a. Character Designing
b. Modeling, Sculpting, Rigging, Lip-sync Synchronization, Jaw Movements, Facial Expressions & Animation.
c. Will be Useful in Medical Graphics, Medical Animation, and Medical Products & Medical Study Reference Videos etc.
d. Advertisement Industry (For Example:- Toothpaste & Toothbrush, Nasal Spray, Cough Syrup, Headache, Cosmetics, Anti Acidity Products, Digestive System, Health related Products, Body-Muscles & Joint Pain Products etc.)

Practical List:

1. Basic Human Proportions (Child to Adult Development) & Character Model Sheet
2. Important Bones
- **2.1.** Human Face (Human Skull, Face & Parts of Face)
- **a.** Human Eyes (External & Internal Structure) & Eye Brows
- **b.** Human Ears (External & Internal Structure)
- **c.** Human Nose (External & Internal Structure: - Respiratory System)
- **d.** Human Lips & Jaw
- **2.2** Human Arm & Palm (Bone Structure)
- **2.3** Rib Cage, Hip Bone & Vertebrae Column
- **2.4** Human Leg & Foot (Bone Structure)

3. Important Human Muscles
- **a.** Facial Muscles (Facial Expressions)
- **b.** Shoulder, Biceps, Triceps & Forearms
- **c.** Stomach (Abdominals)
- **d.** Back Muscles & Wings
- **e.** Thigh & Leg Muscles

4. Respiratory System (All Parts: - Nose to Lungs & Internal Structure)

5. Heart Diagram (for Blood Circulation System) (External & Internal Structure)

6. Digestive System (All Parts: - Mouth to Anus & Internal Structure)

7. Excretory System (Kidney, Liver & Lungs Structure)

8. Human Brain Diagram

9. Stick Poses, Rapid Sketches, Gesture Drawing & Mannequin Poses

10. Detailed Human Figure (Child, Male & Female)

SECOND SEMESTER

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Semester – IV	**Paper – I**
Course Code: BSC-AN 401 T	**Title of the Course: 3D Production-II**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. This course introduces students to all the features of ZBrush.

b. Introduction, Sculpting.

c. Study of Sculpting, Lighting and Rendering.

Detailed Syllabus:

Unit I: 1. ZBrush interface layout and Controls (04 Lecture)

1.1 Basics of sculpting

1.2 Working with canvas and documents

1.3 Menus: conventions and mouse buttons, Move scale and rotate buttons

1.4 Interface: Title bar, Palette buttons, Top-Left-Right shelf, Light Box, 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

Unit II: Working with 3D-Ztools: Sculpt Dragon Head (03 Lecture)
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.
2.7 Complete the Dragon head using various types of brushes, use of Lazy Mouse button

Unit III: Detailing and Finework **(05 Lecture)**

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 Auto Masking and Back Facemask, 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

Unit IV: Modeling with ZSphere chain **(06 Lecture)**
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

Unit V: Masking **(02 Lecture)**
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

Unit VI: Working with UVs **(04 Lecture)**
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

Unit VII: Working with Material **(04 Lecture)**
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]

Unit VIII: Props modelling using Ring 3D (02 Lecture)

8.1 Model collar using Tool geometry crease uncrease
8.2 Create Grass using Fiber Mesh
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

Unit IX: Posing and Lighting (06 Lecture)
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
9.4 Turning the 3 Point lights on and it properties
9.5 Changing the color of the light

Unit X: Rendering (04 Lecture)

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

Suggested Readings:

1. Getting Started ZBrush Author: Greg Johnson

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Semester – IV	**Paper – II**
Course Code: BSC-AN 402 T	**Title of the Course: Motion Graphics**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a.To Learn Motion Graphics

b. Understanding vector animation

c. Learning Adobe After Effects in detail.

Detailed Syllabus:

Unit I: After Effects workflow **(08 Lectures)**

1.1Work area

1.2About Layers

1.3Importing File

1.4 File formats

Unit II: Text **(10 Lectures)**

2.1Text

2.2Text layers

2.3Using a text animation preset

2.4Animating type tracking

Unit III: The Essentials of Typography **(10 Lectures)**

3.1. Types of Type: The Anatomy of a Typeface

3.2. Kerning, Tracking

3.3. Leading

Unit IV: Animated Infographics (12 Lectures)

4.1 Animated Infographics

4.2 Static Infographics

4.3 Animated elements catch the eye

4.4 GIF animated infographics

Suggested Readings:

1. Adobe After Effects CC Classroom in a Book® (2017 Release)

2. Creative Motion Graphic Titling for Film, Video, and the Web_ Dynamic Motion Graphic Title Design

3. https://99designs.com/blog/video-animation/animated-infographics/#:~:text=An%20animated%20infographic%20is%20a,are%20animated%20to%20add%20movement.&text=Whether%20they're%20GIFs%20or%20videos%2C%20animated%20infographics%20are%20visual,consume%20and%20easily%20linked%20to.

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Semester – IV	**Paper – III**
Course Code: BSC-AN 403 T	**Title of the Course: Web Development**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a.To understand web technologies and the issues involved in web designing.

b.By the end of the course the student will be familiarized with the design of the web page and create an interactive and dynamic web page.

Detailed Syllabus:

Unit I: Introduction (08 Lectures)

1.1 Concept of WWW

1.2 Internet and WWW

1.3 HTTP Protocol: Request and Response

1.4 Web browser and Web servers

Unit II: HTML5 (10 Lectures)

2.1 Structuring an HTML Document - Elements and Attributes, Tags, the DOCTYPE Element

2.2 Creating and Saving an HTML Document, Validating an HTML Document, Viewing an HTML Document, Hosting Web Pages.

2.3 Understanding Elements

2.4 Working with Text

2.5 Defining the DIV Element and SPAN Element

2.6 Working with Links The target Attribute, The id Attribute

2.7 Creating Tables

2.8 Working with Images, Colors, and Canvas

2.9 Working with Forms

2.10 Working with Multimedia

Unit III: CSS **(12 Lectures)**

3.1 Evolution, Syntax

3.2 CSS Selectors, Inserting CSS in an HTML Document

3.3 Backgrounds and Color Gradients in CSS

3.4 Font Properties

3.5 Creating Boxes and Columns Using CSS

3.6 Displaying, Positioning, and Floating an Element

3.7 Effects, Frames, and Controls in CSS

Unit IV: JavaScript **(10 Lectures)**

4.1 Features, Using JavaScript in an HTML Document, Fundamentals of JavaScript

4.2 JavaScript Functions, Events, Image Maps, and Animations

4.3 JavaScript Objects - The Standard/Built-in JavaScript Objects

4.4 Working with Browser Objects – Window Object, History Object, Location Object

4.5 Describing the Document Object

4.6 Understanding DOM Nodes, DOM Levels, DOM Interfaces

Suggested Readings:

1. Web Technologies, Black Book, dreamtech Press
2. HTML 5, Black Book, dreamtech Press
3. Web Design, Joel Sklar, Cengage Learning
4. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India

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Semester – IV	**Paper – IV**
Course Code: BSC-AN 404 T	**Title of the Course: Augmented and Virtual Reality**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. **This course provides students with an opportunity to explore the research issues in Augmented Reality and Virtual Reality (AR &VR).**
b. **It also makes the students know the basic concept and framework of virtual reality.**

Detailed Syllabus:

Unit I: Overview **(08 Lectures)**

1.1 Introduction

1.2 The difference between AR and VR

1.3 Virtual Reality

1.4 VR Headset

1.5 VR Companies

1.6 Augmented Reality

1.7 AR Companies

1.8 Mixed Reality

(11 Lectures)

Unit II: Virtual Reality

2.1 Introduction

2.2 Fundamental Concept and Components of Virtual Reality

2.3 Commercial VR Technology

2.4 Classic components of VR system

2.5 Input Devices

2.6 Output Devices

2.7 Modeling

2.8 Human Factors

2.9 Interactive Techniques in Virtual Reality

Unit III: Augmented Reality **(12 Lectures)**

3.1 Introduction

3.2 Brief History

3.3 Examples of AR

3.4 Related fields of AR

3.5 Challenges with AR

3.6 Adding Sound

3.7 Multimodal Display

3.8 Visual Perception

3.9 Spatial Display Model

3.10 Visual Display

3.11 Tracking of AR

3.12 Mobile AR

Unit IV: Creation and application of AR and VR **(09 Lectures)**

4.1 SDK and Games Engine

4.2 Technology and features of augmented reality

4.3 Applications of AR and VR in different Industries

4.4 AR Project Example

4.5 Extended Reality in Marketing

Suggested Readings:

1. Burdea, G. C. and P. Coffet. Virtual Reality Technology, Second Edition. Wiley-IEEE Press, 2003/2006.
2. Alan B. Craig, Understanding Augmented Reality, Concepts and Applications, Morgan Kaufmann, 2013.
3. William R Sherman, Alan B Cranig, Understanding Virtual Reality Interface, Application and Design, Morgan Kaufmann Publishers, 2018.
4. Alan Craig, William Sherman and Jeffrey Will, Developing Virtual Reality Applications, Foundations of Effective Design, Morgan Kaufmann, 2009.

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Semester – IV	**Paper – V**
Course Code: BSC-AN 405 T	**Title of the Course: Animation Film and Process**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. Understanding the various techniques in which we can create our projects.
b. Taking practical knowledge through various assignments.
c. Understanding use of various types of sounds used in animation field.

Detailed Syllabus:

Unit I:

Production (in Various Techniques) **(17 Lectures)**

1.1 2D Animation

- 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

1.2 Stop Motion Animation

- 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

Unit II: 3D Animation (15 Lectures)

2.1 3D Animation

2.2 Modeling

- Material and textures
- Which software needs to be used? Agony of Choice.
- Layout and Cameras

2.3 Rigging

- Character Animation and Motion Capture

2.4 Lighting

- Effects and Simulations
- Rendering
- Live Action Film

Unit III: Post Production (05 Lectures)

1. VFX
2. Sparks
3. Pixie Dust
4. Dust
5. Smoke
6. Lens flare
7. Rain/Snow
8. Camera shake

9. Rotoscoping , Fire/water
10. Compositing
11. Editing
12. Final Output

Unit IV: Sound in Post Production (03 Lectures)

1. Voice Recording.
2. Foley and sound effects
3. Speech that is over-dubbed or recorded.

Suggested Readings:

1. Animation Writing Development Script Pitch by Jean Ann Wright – Focal Press
2. Professional Storyboarding_ Rules of Thumb by Sergio Paez and Anson Jew
3. Writing for Animation, Comics, and Game by Christy Marks – Focal Press
4. Animations - From Concept to Production by Hannes Rall - CRS Press

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Semester – IV	**Paper – VI**
Course Code: BSC –AN 406 T	**Title of the Course: Digital Photography**
Credits: 02	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a.To learn techniques in Photography
b.To learn handling DSLR Camera
c. To learn Adobe Light room

Detailed Syllabus:

Unit I: History of Photography **(08 Lectures)**

1.1 Camera obscuras

1.2 The Invention of Photography Cameras

1.3 First photo ever taken

Unit II: Digital Photography **(08 Lectures)**

2.1 Digital Photography

2.2 Why SLR?

2.3 Aperture, Shutter Speed, ISO
2.4 Specialized Lances (Wide Angle, Zoom, Micro)
2.5 Introduction to Mirrorless Camera

Unit III: Framing **(06 Lectures)**

3.1 Rule of Third

3.2 Layer and Depth

3.3 Line, Colors, Textures, Shape

Unit IV: Types of Photography **(06 Lectures)**

4.1 Portrait Photography

4.2 Product Photography

4.3 Food Photography

4.4 Wildlife Photography

Unit IV: Adobe Light room for Photography **(12 Lectures)**

5.1 Intro Adobe Light room
5.2 Overview of the editing controls
5.3 Adjust lighting, set white balance, Adjust color saturation
5.4 Crop a photo, Adjust perspective with upright
5.5 Edit parts of a photo
(With Radial Gradients, Apply local adjustments
With Linear Gradients, Use the Brush tool to Change part of a photo,
Remove unwanted content with the Healing Brush)

Suggested Readings:

1. https://www.camera-obscura.co.uk/article/what-is-a-camera-obscura
2. https://www.photoblog.com/learn/history-of-cameras/
3. https://www.photoblog.com/learn/first-photograph-in-history/
4. Photography: An Illustrated History Martin W. Sandler
5. DSLR Photography for Beginners (By Brian Black)
6. The Portrait (Glenn Rand, Tim Meyer)
7. THE ART AND STYLE OF Product Photography (J. DENNIS THOMAS)
8. 8. Food Photography A Beginner‘s Guide to Creating Appetizing Images
9. (Corinna Gissemann)
10. Wildlife Photography from Snapshots to Great Shots (Laurie Excell)

Ahmednagar Jilha Maratha Vidya Prasarak Samaj's
New Arts, Commerce and Science College, Ahmednagar (Autonomous)
Syllabus of S. Y. B. Sc. Animation
Under
Faculty Science and Technology

Semester – IV	**Paper – VII**
Course Code: BSC-AN 407 P	**Title of the Course: Motion Graphics & Digital Photography**
Credits: 02	**Total Lectures: 45 Hrs.**

Course Outcomes (COs):

a.To Learn Motion Graphics

b. Understanding vector animation

c. Learning Adobe After Effects in detail.

Practical List:

Motion Graphics

1. Create a Lower third, sting, opening, Bumper
2. Create an Appropriate Title for a movie
3. Create a motion graphics for product Advertise (3D)
4. Create a infographic video Using HUD
5. Create Portfolio

Digital Photography

6. Click 10 photograph (Product) with proper Lighting
7. Click 5 photograph (Food) with proper Lighting and background
8. Click 15 photograph
    a. Leaves
    b. Flowers
    c. Birds, Animals, Insects.
9. Click 5 photographs (textures)
10. Edit all your Photographs Using Adobe Light room

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Semester – IV	**Paper – VIII**
Course Code: BSC-AN 408 P	**Title of the Course: 3D Production-II**
Credits: 02	**Total Lectures: 45 Hrs.**

Course Outcomes (COs):

a. This course introduces students to all the features of ZBrush.

b. Introduction, Sculpting.

c. Study of Sculpting, Lighting and Rendering.

Practical List:

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, and eyes.

8. Sculpt and texture a creature or super Hero character using Alpha with RGB color, 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

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Semester – IV	**Paper – IX**
Course Code: BSC-AN 409 P	**Title of the Course: Web Development**
Credits: 02	**Total Lectures: 45 Hrs.**

Course Outcomes (COs):

a.To understand web technologies and the issues involved in web designing.

b.By the end of the course the student will be familiarized with the design of the web page and create an interactive and dynamic web page.

Practical List: -

1. HTML List
2. HTML Link
3. HTML Table
4. HTML Form
5. HTML Text Formatting
6. HTML Buttons
7. CSS Properties I
8. CSS Properties II
9. CSS Properties III
10. Inline CSS
11. Internal CSS
12. External CSS
13. JavaScript Alert Box
14. JavaScript Array
15. JavaScript Functions

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Semester – IV	**Paper – XII**
Course Code: BSC-AN 412 T	**Title of the Course: 2D Digital Character Animation**
Credits: 2	**Total Lectures: 30 Hrs.**

Course Outcomes (COs):

a. **The big hook of Character Animator is that you can use input from camera & microphone.**
b. **You build a character with its individual parts as separate objects in Illustrator, or on separate layers in Photoshop.**

Detailed Syllabus:

Unit I: Fundamentals of Character Animation (07 Lectures)

1. History of Character Animation
2. Overlapping motion Squash & Stretch principle
3. Primary Action, Secondary Action
4. Live Action & Reaction
5. Pose to pose, Timing

Unit II: Introduction of Adobe Character Animator (10 Lectures)

1. Character Animator's Interface
2. Working with different panels, layers
3. Types of modes Rig mode, Record mode, Stream mode
4. Timeline, properties panel
5. Setting of background and stage
6. Setup a scene
7. Triggers and Draggers

Unit III: Import setting of Audio Manager (06 Lectures)

1. Import audio from recording
2. Lip Synchronization
3. Configuring settings of Cameras and Mic
4. Live recording on Scene

Unit IV: Introduction of Puppet Animation (04 Lectures)

1. History of puppet animation
2. Puppet in Adobe Animate
3. Use of puppet template in character animator

4. Working with hierarchies, pivots and rotation

Unit V: Concept of Character Design (07 Lectures)

1. Create character in Illustrator and Photoshop
2. Design of character of hand, leg, head, and mouth
3. Structures of face, lips and eyes
4. Expressions & acting of character

Unit VI: Animate with Character (06 Lectures)

1. Human 2D Biped walk cycle
2. Human character side run cycle
3. Animal side run cycle
4. Four legged walk cycle
5. Types of key poses

Suggested Readings:

1. Character animation with poser pro.
2. Animation Techniques 6 and 7 Animating a Four-Legged Walk-Cycle Acting in Animation.
3. Character Animation Crash Course!
4. Beginners Guide to Adobe Character Animator

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Semester – IV	**Paper – XIII**
Course Code: BSC-AN 413 P	**Title of the Course: 2D Digital Character Animation (Practical)**
Credits: 02	**Total Lectures: 45 Hrs.**

Course Outcomes (COs):

a. **The big hook of Character Animator is that you can use input from camera & microphone.**
b. **You build a character with its individual parts as separate objects in Illustrator, or on separate layers in Photoshop.**

Practical List: -

Adobe Animate CC

1. Create Puppet in Adobe Illustrator
2. Animating Vector Scene in Adobe Animate CC
3. Create buttons in Adobe Animate CC to play animation
4. Linking The buttons and Scenes in Adobe Animate CC
5. Create stick jump in Adobe Animate CC

Adobe Character Animator CC

1. Head Rigging in Adobe 2D Character Animator
2. Rigging a Robot in Adobe 2D Character Animator
3. Creating Lip Sync Mouth in Adobe 2DCharacter Animator
4. Biped Walk Cycle in Adobe Character Animator
5. Body Tracking in Adobe Character Animator