GURU KASHI UNIVERSITY

Bachelor of Science(Animation & Visual Effects)

2024-25

Department of Computer Application

GRADUATE OUTCOME OF THE PROGRAMME

The B.Sc. (Animation and Visual Effects) program equips graduates with strong creative skills and technical abilities, enabling them to excel in diverse animation roles and drive innovation in digital media and entertainment.

PROGRAMME LEARNING OUTCOMES

After completing the program, the Learner will be able to:

- Apply critical thinking to study and analyze problems in various areas of animation and digital media.
- Analyze and evaluate animation techniques, processes, and technologies to identify areas for improvement and enhance their performance.
- Communicate effectively with diverse stakeholders using a variety of modes and techniques, including storyboards, written reports, oral presentations, and visual aids.
- Contribute to the progressive community and society by comprehending animation activities through effective report writing, designing documentation, delivering impactful presentations, and understanding instructions.
- Demonstrate proficiency in animation software, techniques, and tools, including 2D and 3D animation, visual effects, and digital sculpting.
- Conduct independent research and engage in lifelong learning to stay up-to-date with emerging trends and technologies in animation and digital media.

Course Structure of the Bachelor of Science (Animations & Visual Effects)

Semester 1st						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
BAV101	Basics of Animation	Core	4	0	0	4
BAV102	Graphics Design	Core	4	0	0	4
BAV103	Computer Fundamentals	Compulsory Foundation	2	0	0	2
BAV104	Communication skills-1	Ability Enhancement Course	2	0	0	2
BAV105	Sketching	Technical Skill	0	0	6	3
BAV106	Motion graphics	Technical skill	0	0	6	3
Disciplinary Elective- I (Any one of the following)						
BAV107	Corel draw	Disciplinary Elective-I	3	0	0	3
BAV108	Photoshop					
Total			**15**	**0**	**12**	**21**

Semester II						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
BAV201	Advanced Animation	Core	4	0	0	4
BAV202	Audio & Video- Editing	Core	4	0	0	4
BAV203	Communication Skills – II	Compulsory Foundation	2	0	0	2
BAV204	Digital Compositing	Technical skill	0	0	6	3
BAV205	RotoScopy	Technical skill	0	0	6	3
BAV299	XXXX	MOOC	-	-	-	2
Disciplinary Elective- II (Any one of the following)						
BAV206	Audio Editing	Disciplinary Elective-I	3	0	0	3
BAV207	Story Boarding					
Value Added Course						
BAV208	Gender Equality	VAC	2	0	0	2
Total			**15**	**0**	**12**	**23**

Semester III						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
BAV301	Introduction of 2D Animation	Core	4	0	0	4
BAV302	Basic of Visual effects	Core	4	0	0	4
BAV303	AI Tools for animations	Compulsory Foundation	2	0	0	2
BAV305	Modeling and Texturing	Technical skill	0	0	4	2
BAV306	2D Animation Lab	Technical skill	0	0	4	2
BAV399	XXXX	MOOC	-	-	-	2
Disciplinary Elective- III (Any one of the following)						
BAV307	Digital Painting	Disciplinary Elective-I	3	0	0	3
BAV308	Cleanup					
Open Elective Courses (OEC)						
XXXX		OEC	2	0	0	2
Total			**15**	**0**	**8**	**21**
Open Elective Courses (For other Departments)						
OEC013	Digital Marketing	OEC	2	0	0	2

Semester IV						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
BAV401	Lighting and Rendering	Core	4	0	0	4
BAV402	Rigging and Animation (Maya)	Core	4	0	0	4
BAV403	Environment Studies	Compulsory Foundation	2	0	0	2
BAV404	Advanced Compositing-Lab	Technical skill	0	0	6	3
BAV405	Rigging and Animation -Lab	Technical skill	0	0	6	3
Disciplinary Elective- IV (Any one of the following)						
BAV406	Matte painting	Disciplinary Elective-I	3	0	0	3
BAV407	Match move					
Value Added Course						
BAV408	Yoga for Human Excellence	VAC	2	0	0	2
Total			**15**	**0**	**12**	**21**

Semester V						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
BAV501	Fundamental Dynamics (Maya)	Core	4	0	0	4
BAV502	Matte Painting & Camera Projection	Core	4	0	0	4
BAV503	Advanced Visual Effects	Core	4	0	0	4
BAV504	Multimedia Systems	Compulsory Foundation	2	0	0	2
BAV505	Advanced Visual Effects (Lab)	Technical skill	0	0	4	2
BAV506	Fundamental Dynamics (Lab)	Technical skill	0	0	4	2
BAV599	XXXX	MOOC	-	-	-	2
Disciplinary Elective- V (Any one of the following)						
BAV507	3D simulations	Disciplinary Elective-I	3	0	0	3
BAV508	3D effects					
Total			**17**	**0**	**8**	**23**

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Semester VI						
Course Code	**Course Title**	**Type of Course**	**L**	**T**	**P**	**Credits**
BAV601	Media Laws and Ethics	Core	4	0	0	4
BAV602	Multimedia Security	Core	4	0	0	4
BAV603	Entrepreneurship Development	Compulsory Foundation	2	0	0	2
BAV604	Muscle System	Technical skill	0	0	6	3
BAV605	3D Animation Project	Technical skill	0	0	6	3
Disciplinary Elective- VI (Any one of the following)						
BAV606	Text and image compression	Disciplinary Elective-I	3	0	0	3
BAV607	Audio and video compression					
Value Added Course						
BAV608	Multimedia Communications	VAC	2	0	0	2
Total			**15**	**0**	**12**	**21**

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Grand Total	**92**	**0**	**64**	**130**

Evaluation Criteria for Theory Courses

A. Continuous Assessment:[25Marks]

CA1: Surprise test (Two best out of three)(10Marks)

CA2: Assignment(s) (10Marks)

CA3: Term Paper/Quiz/Presentation (5Marks)

B. Attendance(5marks)

C. Mid Semester Test:[30Marks]

D. End-Term Exam:[40Marks]

SEMESTER I

Course Title: Basics of Animation-1

Course Code: BAV101

L	T	P	Credits
4	0	0	4

Total Hours: 60

Unit I:

Attempts of creating animation in Paleolithic period: Early approaches to motion in art, Study of Paleolithic cave paintings, sequence paintings & Egyptian series of images.

Unit II:

Shadow play The Magic lantern: History of shadow play from 900CE to current period & magic lantern from 16th century and their working mechanism

Unit III:

Animation before film: study and working mechanism of Prelude, Thaumatrope, Phénakisticope, Zoetrope, Flip book, Praxino scope & Zoopraxiscope

Unit IV:

1888-1929: Earliest animations on film: Developed his projection praxino scope into the Théâtre Optique, Standard picture film, Printed animation film, Development of cinematography, Absolute film, transition to synchronized sound and the rise of Disney.

Text book:

https://en.wikipedia.org/wiki/History_of_animation

	L	T	P	Credits
Course Title: Graphics Design	4	0	0	4

Course Code: BAV102

Total Hours: 60

Unit I

Introduction to Adobe Illustrator: Introduction to Adobe Illustrator, work area and workspaces and tools. Opening files, importing art work, viewing art work, rulers and grids, Drawing in Illustrator, drawing lines and shapes, pencil tool, pen tool, editing drawing, tracing, symbols, colouring, applying colours, swatches, adjusting colour and colour settings.

Unit II

Painting with Illustrator: fills, strokes, brushes, transparency, blending, gradient, meshes and colour blending. Selecting, transformation, scaling, grouping, reshaping, cutting, blending of object, creating 3D object, text and typing, special effects, filters, shadows, glow, feathering graphic styles.

Unit III

Corel Draw: Getting Started with Corel Draw X4,Explore the Corel Draw X4 Interface, Customize the Workspace, Differentiate Between Raster and Vector Graphics, importing art work, Set Up a Drawing Page, Draw Shapes, Draw Lines, Bezier, Curves, Shape Tool, Include Objects,

Unit IV

Differentiates between RGB and CMYK: Working with Fills, Pattern, differentiates between RGB and CMYK color and color settings. Working with text tool, Point Text and Paragraph text, Add Text to Objects, Fit Text on a Path, Work with Paragraph Text, Wrap Paragraph text, Work with a Text Style, Insert Special Characters, Spell Check a Documents Create a Table, Modify a Table, Format a Table, Group and ungroup object, Masking Objects

Text Books:

1. Adobe Illustrator CS5 Bible by Steve Johnson.
2. Adobe Illustrator CS5 Bible by Ted Alspach
3. Coral DrawX4 The Official Guide Gary David Boutan
4. Straight to the point Coral DrawX4 Dinesh Maidanani
5. Coral DrawX4 in simple steps- Kogen solution

List of Experiments:

1. Draw a 5 basic object using the basic shapes.
2. Create a business card for graphic design company using the shapes and text.

3. Create a magazine cover page.
4. Create a CD front and back cover design for a music company.
5. Draw simple line object with the help of shape tools in Adobe Illustrator.
6. Create a scene of jungle with lines, shapes and object and pen tool.
7. Apply colour and gradient to above scene.
8. Import a drawing, trace it and apply colour filter and effect and export to various image formats.
9. Some advertisement for products, posters of social importance.

Course Title: Computer Fundamentals	L	T	P	Credits
Course Code: BAV103	2	0	0	2

Total Hours: 30

Learning Outcomes

After the completion of the course the learner will be able to

1. Classify binary, hexadecimal and octal number systems and their arithmetic operations.
2. Analyze the concept of computer devices and the recognition of the basic terms used in computer programming.
3. Identify and learn the details of the components of a personal computer system.
4. Demonstrate the functions of computer programming languages.
5.

Course Content

UNIT I   7 Hours

Computer Fundamentals: Block diagram of a computer, characteristics of computers and generations of computers.

Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.

UNIT II   8 hours

Input Devices: Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Speech Recognition Devices, Optical Recognition devices – OMR, OBR, OCR

Output Devices: Monitors, Printer and its Types.

Memories: Units of Memory, Main Memories - RAM, ROM and Secondary Storage Devices - Hard Disk, Compact Disk, DVD.

UNIT III   7 hours

Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software.

MS Word: Introduction, Creating & Editing Word Document. Saving Document, Working with Text: Selecting, Formatting, Aligning, Finding Replacing Text, Bullets & Numbering, Header & Footer, Working with Tables, Properties Using spell checker, Grammar, Auto Correct Feature, Graphics: Inserting Pictures, Clip art, Drawing Objects, Setting page size and margins; Printing documents, Mail-Merge.

UNIT IV   8 hours

MS-Excel: Environment, Creating, Opening & Saving Workbook, Range of Cells, Formatting Cells, Functions: Mathematical, Logical, Date Time, Auto Sum, Formulas. Graphs: Charts. Types & Chart Toolbar, Printing: Page Layout, Header and Footer Tab.

MS PowerPoint: Environment, Creating and Editing presentation, Auto content wizard using built-in templates, Types of Views: Normal, Outline, Slide, Slide Sorter, Slide Show, Creating, customized templates; formatting presentations, AutoShapes, adding multimedia contents, printing slides

Internet: Basic Internet terms: Web Page, Website, Home page, Browser, URL,

Hypertext, Web Server, Applications: WWW, e-mail, Instant Messaging, Videoconferencing.

Transaction Mode
Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning.

Suggested Readings
- *Sinha P.K. and Sinha P. (2002). Foundations of Computing, First Edition, BPB.*
- *Sanders D.H. (1988). Computers Today, Fourth Edition, McGraw Hill.*
- *Rajaraman V. (1996). Fundamentals of Computers, Second Edition, Prentice Hall of India, New Delhi.*
- *Jain Satish (1999). Information Technology, Paperback Edition, BPB.*

Web Sources
- *https://byjus.com/govt-exams/computer-fundamentals/*
- *https://www.chtips.com/computer-fundamentals/what-is-computer-fundamentals/*
- *https://www.tutorialspoint.com/computer_fundamentals/index.htm*

Course Title: Communication Skill – I	L	T	P	Credits
Course Code: BAV104	2	0	0	2

Course Title: Communication Skill – I

Course Code: BAV104

Total Hours: 30

Unit I: Introduction to English language
a) Need of knowing language
b) Importance of language in present scenario
c) Importance of spoken language in professional life
d) Simple Phonetics for general awareness

Unit II: Introduction to Personnel
a) Self Introduction
b) Introducing others
c) Motivation
d) Positive attitude Body Language

Unit III Functional Grammar
a) Parts of Speech
b) Articles
c) Tenses
d) Tenses and Modals

Unit IV Writing Skills
a) Applications
b) Short passages on given topics

Reference Books*:

1. Remedial English Language by Malti Agarwal, Krishna Prakashan Media (P) Ltd., Meerut.
2. English Grammar Composition & Usage by J.C. Nesfield, Macmillan Publishers
3. The Business letters by Madan Sood, Goodwill Publishing House, New Delhi
4. Communication Skills by Sanjay Kumar & PushpLata, Oxford University Press * Latest edition available of all books

Course Title: Sketching

Course Code: BAV105

Total Hours: 45

L	T	P	Credits
0	0	6	3

Unit I: Introduction for drawing in animation

An introduction of how to make drawings for animation, shapes and forms, About 2D and 3D drawings, Life drawing, Caricaturing-fundamentals, Exaggeration, Silhouette.

Unit II: Background Elements

Background elements, trees, mountains, clouds, water bodies, meadows, buildings, science fiction story backgrounds, backgrounds of mythological stories perspective drawing Lights and shadows day night scenes. Perspective drawing Lights and shadows day night scenes, Concept of layers, Background, stage, foreground elements, Layout designs.

Unit III: Human Anatomy

MALE AND FEMALE ANATOMY- Structure of male and female body, comparative study of male and female body. Draw human body from 2d and 3d basic shapes. Body parts:- Head, Torso, hands, legs, foot and palm. Face:- Different elements of face and their distribution on face. Study of mouth, nose, eyes and ears.

Unit IV: Child, Animal and cartoon study

Child, Animal and cartoon study- Understanding child's figure, proportion and construction of child body, face, chubbiness, hand, feet and gestures. Animals from basic forms, understanding motion and grace of animals, turning animals to character, face, legs, tails, perspectives. Understanding cartoon characters, drawing from basic shapes, line of action, distortion of proportion, cartoon faces, eyes, mouths, hairs, nose, hands, feet, gestures and poses.

Text books:

1. A handbook of Perspective-Stephen M. Ship
2. Cartoons- Persten Blair
3. Human anatomy by-Victor Ferard
4. The Everything Drawing Book: From Basic Shapes To People and Animals by Helen south

	L	**T**	**P**	**Credits**
Course Title: Motion Graphics				
Course Code: BAV106	0	0	6	3

Course Title: Motion Graphics
Course Code: BAV106
Total Hours: 45

Unit I: Introduction to Motion Graphics

a) Overview of Motion Graphics: Definition and applications.
b) History and Evolution of Motion Graphics.
c) Fundamental Principles: Key frames, timing, and spacing.
d) Software Introduction: Adobe After Effects, Cinema 4D, and other industry-standard tools.
e) Basic Animation Techniques: Transformations, transitions, and easing.

Unit II: Design Principles and Typography

a) Design Basics: Color theory, composition, and balance.
b) Typography in Motion: Choosing fonts, kerning, and animating text.
c) Creating Dynamic Text Animations: Text layers, animators, and effects.
d) Integrating Graphic Elements: Logos, icons, and images.
e) Case Studies: Analyzing successful motion graphic designs.

Unit III: Visual Effects and Compositing

a) Introduction to Visual Effects: Basic concepts and workflows.
b) Keying and Masking: Techniques for background removal and compositing.
c) Working with Particles and Simulations: Particle systems, emitters, and dynamics.
d) 3D Integration: Combining 2D and 3D elements.
e) Green Screen Techniques: Shooting, keying, and compositing.

Unit IV: Storytelling and Project Development

a) Narrative Techniques: Storyboarding and planning.
b) Concept Development: Ideation and conceptualization.
c) Layer Management and Precomposing: Organizing projects efficiently.
d) Sound Design: Incorporating audio elements and syncing with visuals.
e) Final Project: Creating a complete motion graphic piece from concept to final render.

Text Books:

1. "Creating Motion Graphics with After Effects" by Chris Meyer and Trish Meyer
2. "Motion Graphic Design: Applied History and Aesthetics" by Jon Krasner
3. "Design for Motion: Fundamentals and Techniques of Motion Design" by

Austin Shaw

4. "After Effects Apprentice" by Chris and Trish Meyer

	L	**T**	**P**	**Credits**
Course Title: Corel Draw	**3**	**0**	**0**	**3**

Course Code: BAV107

Total Hours: 45

Unit I: Introduction to Corel DRAW

a) Overview of Vector Graphics: Differences between vector and raster graphics.
b) Getting Started with CorelDRAW: Interface, tools, and workspace customization.
c) Basic Drawing Tools: Lines, shapes, curves, and Bezier tools.
d) Working with Color: Color palettes, fills, and outlines.
e) Basic Text Handling: Adding, formatting, and editing text.

Unit II: Advanced Drawing Techniques

a) Object Management: Grouping, ungrouping, locking, and aligning objects.
b) Layers and Organization: Using layers for complex designs.
c) Advanced Shapes and Paths: Node editing, shape tools, and path operations.
d) Creating and Editing Symbols: Symbol libraries and usage.
e) Effects and Styles: Applying shadows, glows, transparency, and blends.

Unit III: Design and Layout

a) Page Layout: Setting up multi-page documents, margins, and guidelines.
b) Working with Images: Importing, tracing, and editing bitmaps.
c) Typography: Advanced text effects, font management, and text wrapping.
d) Designing with Precision: Using grids, rulers, and snapping.
e) Templates and Styles: Creating and using templates and graphic styles.

Unit IV: Practical Applications and Projects

a) Branding and Identity Design: Creating logos, business cards, and stationery.
b) Print Design: Designing brochures, flyers, and posters.
c) Web Graphics: Creating web assets, buttons, and banners.
d) Advanced Illustration Techniques: Vector illustration, digital painting, and artistic effects.
e) Final Project: Designing a comprehensive project integrating all learned skills.

Text Books:

1. "CorelDRAW X7: The Official Guide" by Gary David Bouton
2. "CorelDRAW X8: The Official Guide" by Gary David Bouton
3. "CorelDRAW Tips and Tricks" by Anand Dixit
4. "Mastering CorelDRAW" by Rick Altman

Course Title: Photoshop
Course Code: BAV108
Total Hours: 45

L	T	P	Credits
3	0	0	3

Unit I: Introduction to Adobe Photoshop

a) Overview of Raster Graphics: Understanding pixels and resolution.
b) Getting Started with Photoshop: Interface, tools, and workspace customization.
c) Basic Image Editing: Cropping, resizing, and rotating images.
d) Working with Layers: Layer management, blending modes, and layer masks.
e) Color and Brushes: Color modes, swatches, gradients, and brush tool basics.

Unit II: Advanced Image Editing

a) Selection Tools: Marquee, lasso, magic wand, and quick selection tools.
b) Advanced Retouching: Healing brush, clone stamp, and content-aware fill.
c) Adjustment Layers: Brightness/contrast, levels, curves, and color balance.
d) Filters and Effects: Applying and customizing filters, smart filters.
e) Text and Typography: Adding and formatting text, text effects.

Unit III: Compositing and Creative Techniques

a) Layer Styles: Drop shadows, bevel and emboss, and other effects.
b) Masking Techniques: Layer masks, clipping masks, and vector masks.
c) Compositing Images: Combining multiple images, blending techniques.
d) Pen Tool and Paths: Creating and editing paths, vector shapes.
e) Smart Objects: Using smart objects for non-destructive editing.

Unit IV: Practical Applications and Projects

a) Photo Manipulation: Advanced retouching and creative edits.
b) Graphic Design: Creating posters, flyers, and social media graphics.
c) Web Design: Designing web layouts, optimizing images for web.
d) Digital Painting: Custom brushes, painting techniques, and textures.
e) Final Project: Developing a comprehensive project incorporating all learned skills.

Text Books:

1. "Adobe Photoshop Classroom in a Book" by Andrew Faulkner and Conrad Chavez
2. "Photoshop CC: The Missing Manual" by Lesa Snider
3. "The Adobe Photoshop Book for Digital Photographers" by Scott Kelby
4. "Adobe Photoshop CC for Photographers" by Martin Evening

Course Title: Advanced Animation	L	T	P	Credits
Course Code: BAV201	4	0	0	4

Total Hours: 60

Unit I: Golden age of 2D animation in US & other countries

The starting point of Color, depth, cartoon superstars and Snow White and early TV animation in1930s, Shift from classic theatrical cartoons to limited animation in TV series for children in 1950, history of animation.

Unit II: Animation on television

Study of The biggest leap in Animation, Switch from cell animation to computer animation, Early animated music videos, MTV and animated videos

Unit III: In the shadow of computer animation

History of computer animation, rise of anime, impact of 3D animation & CGI animation

Unit IV: Modern Age

Impact of visual effects on TV & movies, social and economic growth of animation industry, rise of gaming industry, new techniques of 3D & visual effects.

Reference books:

1. https://en.wikipedia.org/wiki/History_of_animation
2. A new history of animation by Maureen Furniss

	L	T	P	Credits
Course Title: Audio & Video Editing	4	0	0	4
Course Code: BAV202				
Total Hours: 60				

Unit I: Introduction to Audio & Video Editing

a) Overview of Audio & Video Editing: Concepts, importance, and applications.
b) Introduction to Editing Software: Adobe Premiere Pro, Final Cut Pro, Audacity, and DaVinci Resolve.
c) Basic Workflow: Importing media, organizing assets, and understanding the timeline.
d) Fundamental Editing Techniques: Cutting, trimming, and arranging clips.
e) Understanding File Formats: Audio and video formats, codecs, and exporting.

Unit II: Audio Editing Techniques

a) Basic Audio Editing: Cutting, fading, and crossfading audio tracks.
b) Working with Multiple Audio Tracks: Layering, mixing, and synchronizing.
c) Audio Effects and Filters: Applying equalization, reverb, and other effects.
d) Voiceover and Dubbing: Recording, editing, and integrating voiceovers.
e) Noise Reduction and Restoration: Techniques for cleaning up audio tracks.

Unit III: Video-Editing Techniques

a) Advanced Video Editing: Transitions, speed adjustments, and key framing.
b) Color Correction and Grading: Balancing colors, applying LUTs, and creative grading.
c) Visual Effects and Compositing: Green screen techniques, motion graphics, and visual effects.
d) Titles and Text: Creating and animating titles, lower thirds, and credits.
e) Multi-Camera Editing: Synchronizing and editing footage from multiple cameras.

Unit IV: Project Development and Final Output

a) Storyboarding and Planning: Visualizing the final product, shot lists, and editing plans.
b) Integrating Audio and Video: Syncing audio with video, sound design, and music integration.
c) Editing for Different Platforms: Preparing content for social media, web, and broadcast.

d) Final Output: Rendering and exporting, settings for different platforms, and quality control.
e) Capstone Project: Developing a complete audio-video project from initial concept to final export.

Text Books:

1. "Adobe Premiere Pro Classroom in a Book" by Maxim Jago
2. "Final Cut Pro X: Professional Post-Production" by Brendan Boykin
3. "The Filmmaker's Handbook: A Comprehensive Guide for the Digital Age" by Steven Ascher and Edward Pincus
4. "Audio Post Production for Film and TV" by Mark Cross

Course Title: Communication Skill - II	L	T	P	Credits
Course Code: BAV203	2	0	0	2

Course Title: Communication Skill - II
Course Code: BAV203
Total Hours: 30

Unit I: Advanced Communication Techniques

Building upon foundational communication skills, Advanced verbal communication strategies, Non-verbal communication cues and their impact, Active listening techniques, Developing empathy and rapport in communication, Handling difficult conversations effectively, Understanding cultural differences in communication.

Unit II: Persuasive Communication

Crafting persuasive messages, Understanding audience psychology and motivation, Utilizing storytelling techniques to enhance persuasion, Structuring arguments for maximum impact, Negotiation and persuasion tactics, Overcoming objections and resistance, Ethical considerations in persuasive communication.

Unit III: Interpersonal Dynamics

Developing strong interpersonal relationships, Conflict resolution strategies, Building trust and credibility, Assertiveness training, Setting boundaries in communication, Giving and receiving constructive feedback, Collaborative problem-solving techniques.

Unit IV: Professional Communication

Business communication etiquette, Writing effective emails, memos, and reports, Presentation skills for professionals, Conducting successful meetings and interviews, Networking skills and building professional connections, Cross-cultural communication in the workplace, Using technology for efficient communication.

Textbooks:

1. "Crucial Conversations: Tools for Talking When Stakes Are High" by Kerry Patterson, Joseph Grenny, Ron McMillan, and Al Switzler
2. "Influence: The Psychology of Persuasion" by Robert B. Cialdini
3. "Difficult Conversations: How to Discuss What Matters Most" by Douglas Stone, Bruce Patton, and Sheila Heen
4. "How to Win Friends and Influence People" by Dale Carnegie

Course Title: Digital Compositing

Course Code: BAV204

Total Hours: 45

L	T	P	Credits
0	0	6	3

Unit I: Introduction to Digital Compositing

Understanding the fundamentals of digital compositing, History and evolution of compositing in filmmaking and visual effects, Overview of compositing software and tools, Compositing workflow and pipeline, Basic principles of color theory and color grading, Introduction to keying and masking techniques.

Unit II: Advanced Compositing Techniques

Layer-based compositing techniques, Integration of live-action footage with digital elements, Matte painting and set extensions, Multi-pass compositing for realistic lighting and shadow effects, Match moving and camera tracking, Creating believable visual effects such as explosions, fire, and atmospheric effects.

Unit III: Compositing for Animation

Compositing animated sequences, Character integration into live-action footage, Motion blur and depth of field in compositing, Particle effects and dynamics integration, Lip-syncing and facial animation integration, Advanced techniques for seamless integration of 2D and 3D animation elements.

Unit IV: Specialized Compositing Projects

Compositing for specific genres such as sci-fi, fantasy, and horror, Creating futuristic interfaces and HUD elements, Digital matte painting for environments and landscapes, Compositing for virtual reality and augmented reality experiences, Stereoscopic compositing for 3D films and immersive media.

Textbooks:

1. "The Art and Science of Digital Compositing" by Ron Brinkmann
2. "Digital Compositing for Film and Video" by Steve Wright
3. "Compositing Visual Effects: Essentials for the Aspiring Artist" by Steve Wright
4. "Nuke 101: Professional Compositing and Visual Effects" by Ron Ganbar

Course Title: RotoScopy

Course Code: BAV205

Total Hours: 45

L	T	P	Credits
0	0	6	3

Unit I: Introduction to Rotoscopy

Understanding the basics of rotoscopy, History and evolution of rotoscopy in animation and visual effects, Overview of rotoscoping software and tools, Rotoscoping workflow and techniques, Basic principles of animation applied to rotoscoping.

Unit II: Rotoscoping Fundamentals

Tracing techniques for creating clean and accurate rotoscope shapes, Working with motion blur and complex shapes, Understanding edge detection and refinement tools, Matte creation and manipulation, Time-saving techniques for efficient rotoscoping.

Unit III: Advanced Rotoscoping Techniques

Advanced rotoscoping workflows for challenging shots, Techniques for rotoscoping hair and fur, Dealing with motion interpolation and interpolation errors, Integration of rotoscoped elements into live-action footage, Color correction and matching for seamless integration.

Unit IV: Rotoscoping for Visual Effects

Rotoscoping for visual effects compositing, Creating mattes for green screen and blue screen compositing, Rotoscoping for object removal and replacement, Tracking and matchmoving integration with rotoscoped elements, Stereoscopic rotoscoping for 3D films and VR projects.

Textbooks:

1. "The Art and Science of Digital Compositing" by Ron Brinkmann
2. "Digital Rotoscoping and Paint Techniques" by Ron Ganbar
3. "The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures" by Jeffrey A. Okun and Susan Zwerman
4. "Rotoscoping: Techniques and Tools for the Aspiring Artist" by Benjamin Bratt

	L	T	P	Credits
Course Title: Audio Editing | 3 | 0 | 0 | 3 |

Course Title: Audio Editing

Course Code: BAV206

Total Hours: 45

	L	T	P	Credits
	3	0	0	3

Unit I: Introduction to Audio Editing

a) Understanding the basics of sound and audio editing.
b) Overview of the audio editing process and its applications.
c) Introduction to audio editing software: Audacity, Adobe Audition, Pro Tools, etc.
d) Fundamentals of digital audio: sampling rate, bit depth, and audio formats.
e) Practical session: Setting up an audio editing workstation and exploring software interfaces.

Unit II: Audio Recording Techniques

a) Principles of audio recording: microphones, mixers, and audio interfaces.
b) Techniques for recording high-quality audio in different environments.
c) Understanding signal flow and gain staging.
d) Managing and organizing audio recordings.
e) Practical session: Recording audio using various techniques and equipment.

Unit III: Basic Audio Editing Techniques

a) Introduction to waveform and multitrack editing.
b) Techniques for cutting, trimming, and arranging audio clips.
c) Using fades, crossfades, and transitions.
d) Understanding and applying basic effects: EQ, compression, and reverb.
e) Practical session: Editing a simple audio project using basic techniques.

Unit IV: Advanced Audio Editing Techniques

a) Advanced editing techniques: time stretching, pitch shifting, and noise reduction.
b) Working with multiple tracks and complex arrangements.
c) Using automation for dynamic changes in volume and effects.
d) Layering and blending audio tracks for a polished sound.
e) Practical session: Editing a complex audio project with advanced techniques.

Textbooks:

1. "The Art of Digital Audio" by John Watkinson
2. "Audio Production and Critical Listening: Technical Ear Training" by Jason Corey
3. "Mixing Secrets for the Small Studio" by Mike Senior
4. "Audio Post Production for Television and Film: An Introduction to Technology and Techniques" by Hilary Wyatt and Tim Amyes

Course Title: Story Boarding	**L**	**T**	**P**	**Credits**
Course Code: BAV207	1	0	0	1
Total Hours: 15				

Course Title: Story Boarding
Course Code: BAV207
Total Hours: 15

Unit I: Introduction to Storyboarding

Understanding the role and importance of storyboarding in visual storytelling, History and evolution of storyboarding in filmmaking and animation, Overview of storyboarding software and tools, Fundamental principles of composition, framing, and shot design.

Unit II: Storytelling Techniques

Narrative structure and pacing in storyboarding, Creating compelling characters and environments through visual storytelling, Sequential storytelling and panel layout, Shot types and camera angles for effective storytelling, Emotion and storytelling, Visualizing sound and motion in storyboards.

Unit III: Advanced Storyboarding Concepts

Storyboarding for different genres such as action, comedy, drama, and horror, Creating storyboards for complex sequences like action scenes, chase sequences, and dialogue-driven scenes, Storyboarding for visual effects and animation, Understanding continuity and visual storytelling consistency.

Unit IV: Professional Storyboarding Practices

Storyboarding for previsualization and pitching, Collaboration and communication in the storyboarding process, Feedback and revision techniques, Creating animatics and previsualization sequences, Portfolio development and presentation skills for storyboard artists.

Textbooks:
1. "Prepare to Board! Creating Story and Characters for Animated Features and Shorts" by Nancy Beiman
2. "Storyboarding Essentials: SCAD Creative Essentials (How to Translate Your Story to the Screen for Film, TV, and Other Media)" by David Harland Rousseau and Benjamin Reid Phillips
3. "The Animator's Sketchbook: How to See, Interpret & Draw Like a Master Animator" by Tony White
4. "The Visual Story: Creating the Visual Structure of Film, TV and Digital Media" by Bruce Block

Course Title: Gender Equality	L	T	P	Credits
Course Code: BAV208	2	0	0	2

Course Title: Gender Equality
Course Code: BAV208
Total Hours: 30

Unit I

a) Introduction to Gender Equality
b) Definition and importance of gender equality.
c) Historical overview of gender roles and rights.
d) Key concepts: sex vs. gender, gender identity, and gender expression.
e) Global perspective on gender equality: progress and challenges.
f) International frameworks and agreements: CEDAW, Beijing Platform for Action, Sustainable Development Goals (SDG 5).

Unit II

a) Gender in Society and Culture
b) Gender stereotypes and their impact.
c) Media representation of gender and its societal effects.
d) Intersectionality: understanding how gender intersects with race, class, sexuality, and other identities.
e) Gender roles in different cultures and societies.
f) Case studies: influential gender equality movements and leaders.

Unit III

a) Gender Equality in the Workplace and Education
b) Gender disparities in education: access, quality, and outcomes.
c) Strategies for promoting gender equality in educational settings.
d) Workplace gender equality: understanding the gender pay gap, glass ceiling, and work-life balance.
e) Legal frameworks and policies promoting workplace equality.
f) Best practices for creating inclusive and equitable work environments.

Unit IV

a) Gender differences in health outcomes.
b) Gender Equality and Health
c) Reproductive rights and health.
d) Addressing gender-based violence and its impact on health.
e) Mental health and gender.
f) Policies and programs promoting gender-sensitive healthcare.

Textbooks:

1. Gender Trouble: Feminism and the Subversion of Identity by Judith Butler
2. Half the Sky: Turning Oppression into Opportunity for Women Worldwide by Nicholas D. Kristof and Sheryl WuDunn
3. The Gendered Society by Michael Kimmel
4. Invisible Women: Data Bias in a World Designed for Men by Caroline Criado Perez

Course Title: Introduction of 2D Animation	L	T	P	Credits
Course Code: BAV301	4	0	0	4

Total Hours: 60

Unit I Introduction to Animation:

Understanding the fundamentals of animation, including its history and principles. Differentiating between traditional and digital animation techniques. Exploring the basic tools and software used in 2D animation.

Unit II Storyboarding and Planning:

 Learning the importance of storyboarding in the animation process. Understanding how to create a storyboard for a 2D animation project, including framing, composition, and pacing. Introduction to animatics and pre-visualization techniques.

Unit III Principles of Animation:

Exploring the twelve principles of animation, including squash and stretch, anticipation, timing, and exaggeration. Applying these principles to create convincing and dynamic animation sequences.

Unit IV Character Design and Animation:

Understanding the process of character design for animation. Learning how to create appealing and expressive characters with distinct personalities. Exploring techniques for animating characters using keyframes, rigs, and motion paths.

Unit V Animating Objects and Effects:

Learning how to animate objects, props, and environmental elements in 2D animation. Exploring techniques for animating effects such as smoke, fire, water, and explosions. Introduction to particle systems and procedural animation.

Unit VI Sound Design and Integration:

Understanding the role of sound in animation and how it enhances storytelling. Learning how to synchronize animation with sound effects and dialogue. Exploring techniques for recording, editing, and integrating audio into 2D animation projects.

Unit VII Exporting and Publishing:

Understanding the different file formats used in 2D animation and their compatibility with various platforms. Learning how to export and optimize animation projects for distribution on the web, social media, and other channels.

Textbooks:

1. "The Animator's Survival Kit" by Richard Williams
2. "Character Animation Crash Course!" by Eric Goldberg
3. "Timing for Animation" by Harold Whitaker and John Halas
4. "The Illusion of Life: Disney Animation" by Frank Thomas and Ollie Johnston

Course Title: Basic to Visual Effects	L	T	P	Credits
Course Code: BAV302	4	0	0	4

Course Title: Basic to Visual Effects

Course Code: BAV302

Total Hours: 60

Unit I Introduction to Visual Effects (VFX):

Understanding the role and significance of VFX in various media forms such as film, television, advertising, and gaming. Exploring the history and evolution of visual effects techniques.

Unit II Fundamental Concepts:

Introducing basic concepts and principles of visual effects, including compositing, masking, keying, and tracking. Understanding the difference between practical effects and digital effects.

Unit III Software and Tools:

Introduction to industry-standard software tools for creating visual effects, such as Adobe after Effects, Nuke, and Autodesk Maya. Exploring the interface, tools, and basic functionalities of VFX software.

Unit IV Compositing and Layering:

Understanding the process of compositing multiple visual elements to create seamless and realistic VFX shots. Learning how to layer elements, adjust blending modes, and use masks and mattes for effective compositing.

Textbooks:

1. "The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures" edited by Jeffrey A. Okun and Susan Zwerman
2. "Digital Compositing for Film and Video" by Steve Wright
3. "The Art and Science of Digital Compositing: Techniques for Visual Effects, Animation and Motion Graphics" by Ron Brinkmann
4. "Matchmoving: The Invisible Art of Camera Tracking" by Tim Dobbert

Course Title: AI Tools for Animations	L	T	P	Credits
Course Code: BAV303	2	0	0	2

Course Title: AI Tools for Animations

Course Code: BAV303

Total Hours: 30

Unit I: Introduction to AI in Animation

a) Understanding the role of AI in modern animation workflows.
b) Overview of AI technologies and tools used in animation.
c) Applications of AI in character animation, motion capture, and procedural generation.
d) Introduction to key AI concepts: machine learning, neural networks, and deep learning.
e) Practical session: Exploring AI tools and their applications in animation.

Unit II: AI-Based Character Animation

a) AI techniques for automating character rigging and skinning.
b) Using AI for generating realistic character movements and behaviors.
c) Introduction to motion capture technology and AI-based motion retargeting.
d) Practical session: Implementing AI-based character rigging and animation using tools like Adobe Character Animator and DeepMotion.

Unit III: Procedural Animation with AI

a) Understanding procedural animation and its benefits.
b) AI-driven techniques for generating procedural animations.
c) Applications of procedural animation in environments, crowds, and particle systems.
d) Practical session: Creating procedural animations using Houdini and AI plugins.

Unit IV: AI in Facial Animation and Lip Sync

a) Techniques for AI-based facial animation and emotion detection.
b) Automating lip-syncing using AI tools.
c) Applications of deep learning in realistic facial animation.
d) Practical session: Implementing AI-driven facial animation and lip-sync using tools like Faceware and Adobe Character Animator.

Textbooks:

1. "Artificial Intelligence for Games" by Ian Millington and John Funge
2. "Deep Learning for Computer Vision" by Rajalingappaa Shanmugamani
3. "Character Animation Crash Course!" by Eric Goldberg (supplemental for traditional concepts)
4. "Practical Deep Learning for Cloud, Mobile, and Edge" by AnirudhKoul, Siddha Ganju, and MeherKasam

Course Title: Media & Cyber Laws	L	T	P	Credits
Course Code: BAV304	2	0	0	2

Course Title: Media & Cyber Laws
Course Code: BAV304
Total Hours: 30

Unit I Introduction to Media Laws:
Understanding the legal framework governing media activities, including print, broadcast, and digital media. Exploring the principles of freedom of speech, expression, and press freedom. Overview of international, national, and regional media laws.

Unit II Regulation of Traditional Media:
Examining the legal regulations and ethical standards applicable to traditional media platforms such as newspapers, magazines, radio, and television. Understanding issues related to defamation, privacy, copyright, and intellectual property rights in traditional media.

Unit III Broadcasting Regulations:
Understanding the legal requirements and licensing procedures for radio and television broadcasting. Exploring the role of regulatory bodies in overseeing broadcast content, advertising standards, and media ownership regulations.

Unit IV Online Content Regulation:
Analyzing the legal challenges and regulatory frameworks for online media platforms, including websites, social media, streaming services, and digital publications. Understanding issues such as online harassment, hate speech, fake news, and content moderation

Textbooks:
1. "Media Law for Journalists" by Ursula Smartt
2. "Cyberlaw: Problems of Policy and Jurisprudence in the Information Age" by Patricia Bellia, Paul Berman, Brett Frischmann, and David Post
3. "The Law of Journalism and Mass Communication" by Robert Trager, Susan Dente Ross, and Amy Reynolds
4. "Information Privacy Law" by Daniel J. Solove, Paul M. Schwartz, and Daniel J. Solove

	L	T	P	Credits
	0	0	4	2

Course Title: Modeling and Texturing
Course Code:BAV305
Total Hours: 30

Unit I Introduction to 3D Modeling:

Understanding the principles and techniques of 3D modeling for digital content creation. Exploring different modeling workflows, including polygonal modeling, spline modeling, and sculpting. Introduction to 3D modeling software such as Autodesk Maya, Blender, and ZBrush.

Unit II Polygonal Modeling:

Learning the fundamentals of polygonal modeling, including modeling basic shapes, extrusion, beveling, and edge loops. Understanding polygonal topology and efficient modeling techniques for creating complex 3D objects.

Unit III Spline Modeling:

Exploring spline-based modeling techniques for creating smooth and organic shapes. Learning how to use spline tools to create curves, surfaces, and intricate details. Understanding the advantages and limitations of spline modeling compared to polygonal modeling.

Unit IV Digital Sculpting:

Introduction to digital sculpting techniques using software such as ZBrush or Mudbox. Learning how to sculpt organic forms, characters, creatures, and intricate details using sculpting brushes and tools. Understanding the sculpting workflow and techniques for refining sculpted models.

Textbooks:
1. "Digital Modeling" by William Vaughan
2. "ZBrush Character Creation: Advanced Digital Sculpting" by Scott Spencer
3. "Texturing and Modeling: A Procedural Approach" by David S. Ebert, F. Kenton Musgrave, Darwyn Peachey, Ken Perlin, and Steven Worley
4. "Substance Painter Foundations" by Grant Warwick

Course Title:2D Animation Lab	L	T	P	Credits
Course Code: BAV306	0	0	4	2

Course Title:2D Animation Lab

Course Code: BAV306
Total Hours: 60

Unit I Introduction to Animation:

Understanding the basic principles and history of animation. Exploring different animation techniques and styles. Introduction to the principles of timing, spacing, and motion in animation.

Unit II Storyboarding and Planning:

Learning the importance of storyboarding in the animation process. Understanding how to create storyboards and animatic to plan out the sequence of scenes and actions in an animation. Introduction to character development and storytelling.

Unit III Traditional Animation Techniques:

Exploring traditional hand-drawn animation techniques. Learning how to create animation using pencil and paper, including keyframes, breakdowns, and in-between frames. Understanding the principles of squash and stretch, anticipation, and follow-through.

Unit IV Digital Animation Tools:

Introduction to digital animation software such as Adobe Animate, Toon Boom Harmony, and TVPaint Animation. Exploring the interface, tools, and basic functionalities of digital animation software. Learning how to create digital drawings, animate characters, and manipulate keyframes.

Textbooks:
1. "The Animator's Survival Kit" by Richard Williams
2. "Character Animation Crash Course!" by Eric Goldberg
3. "The Illusion of Life: Disney Animation" by Frank Thomas and Ollie Johnston
4. "Creating Characters with Personality: For Film, TV, Animation, Video Games, and Graphic Novels" by Tom Bancroft

Course Title: Digital Painting
Course Code: BAV307
Total Hours: 45

L	T	P	Credits
3	0	0	3

Unit I Introduction to Digital Painting:

Understanding the basics of digital painting and its applications in various industries such as illustration, concept art, and digital media. Exploring the advantages of digital painting compared to traditional painting techniques.

Unit II Digital Painting Tools and Software:

Introduction to digital painting software such as Adobe Photoshop, Corel Painter, and Procreate. Exploring the interface, tools, and basic functionalities of digital painting software. Learning how to set up a digital workspace and customize brushes and settings.

Unit III Basic Painting Techniques:

Learning the fundamental painting techniques used in digital painting, including brushwork, blending, layering, and masking. Understanding the principles of color theory, value, and composition in digital painting.

Unit IV Understanding Light and Shadow:

Exploring the principles of light and shadow in digital painting. Learning how to create realistic lighting effects, cast shadows, and highlights using digital painting techniques. Understanding how light interacts with different surfaces and materials.

Textbooks:
1. "Digital Painting Techniques" by 3dtotal Publishing
2. "Beginner's Guide to Digital Painting in Photoshop" by NykolaiAleksander and Richard Tilbury
3. "Color and Light: A Guide for the Realist Painter" by James Gurney
4. "ImagineFX Magazine" (for inspiration and tutorials)

	L	T	P	Credits
Course Title: Cleanup	3	0	0	3

Course Code: BAV308

Total Hours: 15

Unit I Introduction to Cleanup:

Understanding the role and importance of cleanup in the animation production process. Exploring the difference between rough animation and cleanup, and the significance of maintaining consistency and quality in cleanup work.

Unit II Tools and Software:

Introduction to the tools and software used in cleanup work, including digital drawing tablets, software such as Adobe Photoshop, Adobe Animate, Toon Boom Harmony, and TVPaint Animation. Exploring the interface, tools, and basic functionalities of cleanup software.

Unit III Understanding Line Quality:

Learning how to analyze and improve the line quality in animation drawings. Understanding the principles of clean lines, line weight, and line consistency. Exploring techniques for creating smooth, fluid lines with proper spacing and thickness.

Unit IV Character Cleanup:

Understanding the process of cleaning up character animation drawings. Learning how to refine and polish rough character designs, ensuring accuracy and consistency in proportions, anatomy, and details. Exploring techniques for cleaning up facial expressions, gestures, and movements.

Textbooks:
1. "The Animator's Survival Kit" by Richard Williams
2. "The Art of Clean Up: Life Made Neat and Tidy" by UrsusWehrli
3. "Clean Up Your Act: Effective Ways to Organize --- Your Life and Business" by Tim Challies

4. "The Animation Studio: How to Create Stop Motion, 2D and 3D Animation in the Digital Age" by Helen Piercy

Course Title: Digital Marketing	L	T	P	Credits
Course Code: OEC013	2	0	0	2

Total Hours: 30

Learning Outcomes

After completion of this course, the learner will be able to:

1. Understanding the digital marketing concepts and its usefulness in business.
2. Planning steps for digital marketing strategy and successfully executing it.
3. Applying Search Engine Optimization techniques (SEO) and Search Engine Marketing (SEM) to maximize reach and enhance engagement of users.
4. Analyzing web using analytics tools and gaining insights to various tools for Social Media Marketing.

Course Content

UNIT I   **8 hours**
Digital Marketing Basics: Digital Marketing meaning and its importance, Traditional vs Digital Marketing, Benefits of Digital Marketing, Internet Marketing basics, Digital Marketing channels, Types of Business models, Digital Marketing strategies (P.O.E.M framework), Inbound and Outbound marketing, Digital Transformation model, 4Cs of Digital Marketing.

UNIT II   **7 hours**
Social Media Marketing – Introduction, Social Media marketing strategies, Overview of Social media platforms – Instagram, Snapchat, Facebook, Mobile, Twitter, Content Planning and Strategy, Influential marketing, Content marketing, Digital Marketing campaign.

UNIT III   **8 hours**
Search Engine Optimization – Introduction to SEO, On-Page and Off-Page Optimization, Role of Keywords in SEO, Organic vs Non-Organic SEO, Blogging as marketing strategy, Types of Blogs. Search Engine Marketing – Introduction to Paid marketing, Google Adwords, Types of campaigns and Campaign creation.

UNIT IV   **7 hour**
Tools for SMM and Marketing communication – Overview of Buffer, Hoot suite, Canva, Trello and Hot jar. Web Analytics: Meaning, Purpose and process, Types, Tools for analytics – Google analytics, Audience analytics, Acquisition analytics, Behavior analytics, and Conversion analytics.

Transactional Mode
Lecture Method, E-Team Teaching, Video based learning, Demonstration, Peer Discussion, Open talk, Cooperative Teaching, Flipped Teaching, Collaborative Learning

Suggested Readings
- *Rajan Gupta, Supriya Madan, "Digital Marketing", BPB Publication, Ist Edition, 2022*
- *Seema Gupta, "Digital Marketing", McGraw Hill, 2nd Edition, 2018.*
- *Puneet Singh Bhatia, "Fundamentals of Digital Marketing", Pearson, 2nd Edition, 2020.*

Web Sources
- *https://josephscollege.ac.in/lms/Uploads/pdf/material/DigitalMar keting_Notes.pdf*

- *https://www.digitalmarketer.com/digitalmarketing/assets/pdf/ultimate-guide-to-digital-marketing.pdf*

Semester IV

		L	T	P	Credits
Course Title: Lighting and Rendering		**4**	**0**	**0**	**4**
Course Code: BAV401					

Total Hours: 60

Unit I Introduction to Lighting and Rendering

a) Overview of lighting and rendering in digital graphics.
b) The importance of lighting and rendering in visual storytelling.
c) Basic concepts: light sources, shadows, and reflections.
d) Types of lighting: natural vs. artificial, direct vs. indirect.
e) Introduction to rendering engines: CPU vs. GPU rendering.

Unit II Fundamentals of Lighting

a) Properties of light: intensity, color, and temperature.
b) Lighting techniques: three-point lighting (key, fill, and backlight).
c) Understanding and using different types of lights: point light, directional light, spot light, area light.
d) Creating mood and atmosphere with lighting.
e) Practical exercises with different lighting setups in software (e.g., Maya, Blender, 3ds Max).

Unit III Advanced Lighting Techniques

a) Global illumination and its impact on realistic rendering.
b) Light mapping and baking techniques for optimized rendering.
c) High dynamic range imaging (HDRI) for realistic lighting environments.
d) Volumetric lighting and fog for atmospheric effects.
e) Case studies of lighting setups in film and game production.

Unit IV Rendering Techniques and Optimization

a) Understanding rendering algorithms: rasterization vs. ray tracing.
b) Shading models: Phong, Blinn-Phong, Lambertian, and physically-based rendering (PBR).
c) Materials and textures: creating realistic surfaces using shaders.
d) Render settings and optimization techniques to reduce render times.
e) Post-processing effects: bloom, depth of field, motion blur, and color correction.
f) Exporting and compositing rendered images.

Textbooks:

1. Digital Lighting and Rendering by Jeremy Birn

2. The Art of 3D Computer Animation and Effects by Isaac V. Kerlow

3. Advanced Global Illumination by Philip Dutre, Philippe Bekaert, and KavitaBala

4. Real-Time Rendering by Tomas Akenine-Möller, Eric Haines, and Naty Hoffman

Course Title: Rigging and Animation (Maya)

Course Code: BAV402

L	T	P	Credits
4	0	0	4

Total Hours: 60

Unit I Introduction to Rigging in Maya

a) Overview of rigging in 3D animation.

b) Introduction to Maya interface and tools.
c) Basic concepts: joints, skeletons, and kinematics.
d) Creating a simple joint chain.
e) Forward kinematics (FK) vs. inverse kinematics (IK).
f) Setting up IK handles and controllers.

Unit II Advanced Rigging Techniques

a) Building a complete character skeleton.
b) Skinning: binding the mesh to the skeleton.
c) Weight painting for smooth deformations.
d) Creating and using deformers: blend shapes, lattices, and clusters.
e) Rigging facial expressions and lip-syncing.
f) Introduction to rigging scripts and automation.

Unit III Introduction to Animation in Maya

a) Key principles of animation: squash and stretch, anticipation, and follow-through.
b) Understanding the timeline and keyframing.
c) Creating basic animations: bouncing ball and simple walk cycle.
d) Graph Editor: editing animation curves for smooth motion.
e) Using the Dope Sheet for timing adjustments.

Unit IV Advanced Animation Techniques

a) Character animation: refining walk and run cycles.
b) Animating facial expressions and dialogue.
c) Using constraints for more complex animations.
d) Working with animation layers for non-destructive editing.
e) Introduction to motion capture data and cleanup.
f) Finalizing animations: polishing and adding secondary motion.

Textbooks:

1. The Animator's Survival Kit by Richard Williams
2. Maya Character Creation: Modeling and Animation Controls by Chris Maraffi
3. Rig it Right! Maya Animation Rigging Concepts by Tina O'Hailey
4. Maya Studio Projects: Game Environments and Props by Michael McKinley

Course Title: Environment Studies

Course Code: BAV403

L	T	P	Credits
2	0	0	2

Total Hours: 30

Unit I

a) The Multidisciplinary nature of environmental studies Definition, scope and

importance, Need for public awareness.

b) Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems.

c) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people.

d) Water resources: Use and over-Utilization of surface and ground water, floods, drought, conflicts and water, dams-benefits and problems.

e) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.

f) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

g) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources.

h) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

Unit II

a) E-Concept of an ecosystem: Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids.

b) Biodiversity and its conservation: Introduction – Definition: genetic, species and ecosystem diversity, Bio-geographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels, India as a mega-diversity nation.

Unit III

a) Environmental Pollution Definition: Causes, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards, ill-effects of fireworks,

b) Solid waste Management: Causes, effects and control measures of urban and industrial wastes, Role of an individual in prevention of pollution, Disaster management: floods, earthquake, cyclone and landslides.

Unit IV

a) Social Issues and the Environment: From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns

b) Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation, Consumerism and waste products,

c) Environment Protection Act, Air (Presentation and Control of Pollution)

d) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act,

e) Forest Conservation Act, Issues involved in enforcement of environmental legislation.

f) Human Population and the Environment: Population growth, variation among nations, Population explosion – Family Welfare Programme, Environment and human health, Human Rights, Value Education, HIV / AIDS, Women and Child Welfare

Textbooks:

1. Agarwal K.C. (2001). Environment Biology, Nidi Publ. Ltd. Bikaner.
2. Jadhav H & Bhosale (1995). Environment Protection and Laws, Himalaya Publication House, Delhi.
3. Rao M.N. & Datta A.K. (1987). Waste Water, Treatment Oxford & IBH Publ. Co. Pvt. Ltd.

Course Title: Advanced Compositing (Lab)	L	T	P	Credits
Course Code: BAV404	0	0	4	3

Total Hours: 60

Unit I Introduction to Advanced Compositing

a) Overview of compositing in visual effects and post-production.
b) Introduction to compositing software: Adobe After Effects, Nuke, Fusion.
c) Basic concepts: layers, masks, and blend modes.

d) Importing and organizing assets in a compositing project.

e) Understanding color space and bit depth.

Unit II Keying and Rotoscoping

a) Keying techniques: chroma key (green/blue screen) and luma key.

b) Using keying tools: Keylight, Primatte, and Ultimatte.

c) Refining keying results: edge refinement, despill, and matte choker.

d) Rotoscoping fundamentals: drawing and animating masks.

e) Advanced rotoscoping: motion tracking and planar tracking.

f) Practical lab exercises on keying and rotoscoping.

Unit III Color Correction and Grading

a) Principles of color theory in compositing.

b) Color correction tools: levels, curves, and color balance.

c) Matching colors across different elements of a composite.

d) Introduction to color grading: creating mood and atmosphere.

e) Using lookup tables (LUTs) for consistent grading.

f) Practical lab exercises on color correction and grading.

Unit IV Advanced Compositing Techniques

a) Working with 3D elements in a composite: 3D camera tracking and match moving.

b) Integrating CGI with live-action footage: shadows, reflections, and ambient occlusion.

c) Particle systems and simulations: creating rain, smoke, fire, and other effects.

d) Advanced effects: motion blur, depth of field, and lens flares.

e) Multi-pass compositing: using render passes to achieve photorealism.

f) Finalizing a composite: output settings and render optimization.

g) Case studies and project-based learning.

Textbooks:

1. Digital Compositing for Film and Video by Steve Wright
2. The Art and Science of Digital Compositing by Ron Brinkmann
3. Compositing Visual Effects: Essentials for the Aspiring Artist by Steve Wright
4. Nuke 101: Professional Compositing and Visual Effects by Ron Ganbar

Course Title: Rigging And Animation (Lab)	L	T	P	Credits
Course Code: BAV405	0	0	4	3

Total Hours: 60

Unit I Introduction to Rigging

a) Overview of the rigging process in 3D animation.
b) Exploring Maya interface and essential tools for rigging.
c) Creating basic joint chains: understanding joint orientation and hierarchy.
d) Introduction to kinematics: Forward Kinematics (FK) vs. Inverse Kinematics (IK).

e) Setting up simple IK handles and creating basic controllers.
f) Practical lab: Building a simple rig for a character's arm.

Unit II Character Rigging Techniques

a) Constructing a complete character skeleton.
b) Skinning: binding the mesh to the skeleton for deformation.
c) Weight painting: distributing influence for smooth deformations.
d) Creating and configuring deformers: blend shapes, lattices, clusters.
e) Rigging facial features for expressions and lip-syncing.
f) Advanced controllers: set-driven keys, custom attributes, and SDKs.
g) Practical lab: Rigging a full character model.

Unit III Introduction to Animation

a) Principles of animation: squash and stretch, anticipation, timing, and follow-through.
b) Keyframing basics: setting, moving, and deleting keyframes in Maya.
c) Animating simple objects: bouncing ball and pendulum swing.
d) Using the Graph Editor: understanding and manipulating animation curves.
e) Timing and spacing adjustments using the Dope Sheet.
f) Practical lab: Animating a bouncing ball with varying timing.

Unit IV Advanced Animation Techniques

a) Character animation: walk cycles, run cycles, and other basic movements.
b) Animating facial expressions and syncing dialogue.
c) Using constraints for complex animations: parent, point, orient, and aim constraints.
d) Animation layers: managing and blending multiple animation sequences.
e) Introduction to motion capture data: importing, retargeting, and cleaning up mocap data.
f) Polishing animations: adding secondary actions and refining movements.
g) Practical lab: Creating a short animated sequence with a character.

Textbooks:

1. The Animator's Survival Kit by Richard Williams
2. Maya Character Creation: Modeling and Animation Controls by Chris Maraffi
3. Learning Autodesk Maya 2022: A Comprehensive Guide by Cadcim Technologies
4. Maya Professional Tips and Techniques by Lee Lanier

Course Title: Matte Painting

Course Code: BAV406

Total Hours: 45

L	T	P	Credits
3	0	0	3

Unit I Introduction to Matte Painting

  a) Definition and history of matte painting in film and digital media.
  b) Overview of traditional vs. digital matte painting techniques.
  c) The role of matte painting in visual effects and storytelling.
  d) Introduction to software and tools: Adobe Photoshop, Adobe After Effects, and other digital painting tools.

e) Basic concepts: composition, perspective, and color theory.
f) Practical lab: Creating simple matte paintings using reference images.

Unit II Digital Painting Techniques

a) Understanding and creating different types of brushes in Photoshop.
b) Techniques for painting skies, clouds, and basic landscapes.
c) Working with layers: blending modes, masks, and layer styles.
d) Texturing and detailing: adding realism to digital paintings.
e) Photo-bashing techniques: integrating photographic elements into paintings.
f) Practical lab: Painting a detailed landscape scene.

Unit III Advanced Matte Painting Techniques

a) Creating complex environments: cityscapes, forests, mountains.
b) Incorporating 3D elements: using 3D software (e.g., Maya, Blender) to create base models.
c) Camera projection techniques: projecting matte paintings onto 3D geometry.
d) Light and shadow: understanding lighting in different scenarios and painting accordingly.
e) Atmospheric effects: adding fog, haze, and depth to paintings.
f) Practical lab: Creating a multi-layered matte painting with depth and lighting effects.

Unit IV Integration and Compositing

a) Integrating matte paintings into live-action footage.
b) Using tracking and match-moving techniques to ensure proper alignment.
c) Compositing matte paintings with visual effects software: Adobe After Effects or Nuke.
d) Color correction and grading to match footage.
e) Final touches: adding motion blur, grain, and other post-production effects.
f) Case studies: analysis of professional matte paintings in films and TV.
g) Practical lab: Completing a project by integrating a matte painting into a live-action sequence.

Textbooks:

1. D'artiste Matte Painting by Dylan Cole, Chris Stoski, and Alp Altiner

2. Digital Matte Painting Essentials: 1 by David Mattingly

3. Photoshop for 3D Artists: Volume 1 by Steve Caplin

4. The Invisible Art: The Legends of Movie Matte Painting by Mark Cotta Vaz and Craig Barron

Course Title: Match Move	L	T	P	Credits
Course Code: BAV407	3	0	0	3

Course Title: Match Move
Course Code: BAV407
Total Hours: 45

Unit I Introduction to Match Moving

a) Definition and importance of match moving in visual effects.
b) Overview of the match moving process and applications.
c) Introduction to match moving software: PFTrack, Boujou, Mocha, and After Effects.
d) Basic concepts: tracking points, camera movement, and coordinate systems.
e) Practical lab: Setting up a simple match move project and tracking basic footage.

Unit II 2D Tracking Techniques

a) Understanding 2D tracking and its applications.
b) Types of trackers: point trackers, planar trackers.
c) Tracking techniques: manual, automatic, and hybrid tracking.
d) Solving common tracking issues: motion blur, occlusions, and lighting changes.
e) Practical lab: Using 2D tracking to stabilize footage and track simple objects.

Unit III 3D Camera Tracking

a) Introduction to 3D camera tracking: concepts and workflow.
b) Identifying and selecting trackable features in footage.
c) Solving the camera: creating a 3D camera move from 2D footage.
d) Refining the solve: adjusting track points and optimizing the camera path.
e) Integrating 3D elements into tracked footage.
f) Practical lab: Performing a full 3D camera track and placing 3D objects into a scene.

Unit IV Advanced Match Moving Techniques

a) Object tracking: tracking moving objects independently from the camera.
b) Match moving with green screen footage: integrating CGI into keyed footage.
c) Using lens distortion data: undistorting and redistorting footage for accurate tracking.
d) Scene reconstruction: creating a 3D environment from tracked footage.
e) Combining match move data with other VFX elements: particles, simulations, and matte paintings.
f) Case studies: analysis of complex match moving projects in film and television.
g) Practical lab: Completing an advanced match move project with multiple elements.

Textbooks:

1. Matchmoving: The Invisible Art of Camera Tracking by Tim Dobbert
2. The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures by Jeffrey A. Okun and Susan Zwerman
3. Digital Compositing for Film and Video by Steve Wright
4. The Filmmaker's Guide to Visual Effects: The Art and Techniques of VFX for Directors, Producers, Editors and Cinematographers by EranDinur

L	T	P	Credits
2	0	0	2

Course Title: Yoga for Human Excellence

Course Code: BAV408

Total Hours: 30

Unit I: Introduction to Yoga Philosophy

   a) Understanding the origins and philosophy of yoga.
   b) Exploring the eight limbs of yoga (Ashtanga Yoga) according to Patanjali's Yoga Sutras.
   c) Introduction to Hatha Yoga and its principles.
   d) The holistic approach of yoga towards physical, mental, and spiritual well-being.
   e) Practical session: Basic yoga postures (asanas) and breathing techniques (pranayama).

Unit II: Physical Aspects of Yoga Practice

a) Exploring the anatomy and physiology of yoga postures.
b) Understanding alignment principles for safe and effective practice.
c) Developing strength, flexibility, and balance through asana practice.
d) Yoga for stress relief and relaxation: practicing restorative and gentle yoga sequences.
e) Practical session: Sun Salutations (Surya Namaskar) and variations.

Unit III: Mental and Emotional Well-being

a) The role of yoga in promoting mental health and emotional balance.
b) Techniques for mindfulness and meditation in yoga practice.
c) Yoga psychology: understanding and managing emotions.
d) Cultivating positive thinking and resilience through yoga.
e) Practical session: Guided meditation and relaxation techniques.

Unit IV: Yoga for Spiritual Growth and Self-Realization

a) Exploring the deeper dimensions of yoga beyond physical practice.
b) The concept of self-awareness (AtmaBodha) and self-realization (AtmaJnana).
c) Integrating yoga philosophy into daily life: living with mindfulness and compassion.
d) Understanding the interconnectedness of all beings (Yoga Vasishtha).
e) Practical session: Yoga Nidra for deep relaxation and inner exploration.

Textbooks:

1. "The Heart of Yoga: Developing a Personal Practice" by T.K.V. Desikachar
2. "Light on Yoga" by B.K.S. Iyengar
3. "The Yoga Sutras of Patanjali" by Sri Swami Satchidananda
4. "The Key Muscles of Yoga" by Ray Long

Semester V

Course Title: Fundamental Dynamics in Maya

Course Code: BAV501

Total Hours: 60

L	T	P	Credits
4	0	0	4

Unit I: Introduction to Dynamics

a) Overview of dynamics in 3D animation
b) Understanding the role of dynamics in creating realistic motion
c) Introduction to Autodesk Maya's dynamics tools and workflows

Unit II: Particle Systems

a) Exploring particle systems in Maya
b) Creating particle emitters and controlling particle behaviour
c) Understanding forces, fields, and collisions in particle simulations

Unit III: Rigid Body Dynamics

a) Introduction to rigid body dynamics
b) Creating dynamic objects and setting up collisions
c) Understanding constraints and connections between rigid bodies

Unit IV: Soft Body Dynamics

a) Understanding soft body dynamics and deformations
b) Creating soft bodies and adjusting properties such as elasticity and damping
c) Exploring cloth simulations and controlling cloth behavior

Unit V: Fluid Dynamics

a) Introduction to fluid dynamics simulation
b) Creating fluid containers and emitters
c) Understanding viscosity, turbulence, and surface tension in fluid simulations

Unit VI: Dynamic Effects

a) Exploring additional dynamic effects such as hair, fur, and nParticles
b) Understanding how to integrate dynamic effects with character animation
c) Optimizing dynamic simulations for efficiency and realism

Unit VII: Dynamic Simulations in Production

a) Applying dynamic simulations to real-world animation projects
b) Understanding the workflow for integrating dynamics with other aspects of animation production
c) Troubleshooting common issues and optimizing dynamic simulations for rendering

Unit VIII: Advanced Dynamics Techniques

a) Exploring advanced dynamics techniques and workflows
b) Understanding how to create complex simulations such as destruction and fluid effects
c) Experimenting with dynamic effects to push the boundaries of creativity

Unit IX: Simulation Rendering and Output

a) Rendering dynamic simulations in Maya
b) Understanding rendering settings and optimization for dynamic simulations
c) Exporting simulation data for use in other software or compositing applications

Unit X: Final Project

a) Applying the knowledge and skills learned throughout the course to complete a final dynamic simulation project
b) Students will develop their own dynamic simulation sequence or scene, incorporating elements such as particle effects, rigid bodies, soft bodies, and fluid simulations

Textbooks:

1. "Introducing Maya 2023" by DariushDerakhshani
2. "Maya Dynamics: Tips, Tricks, and Techniques" by Todd Palamar
3. "Learning Autodesk Maya 2023: A Hands-On Approach" by Mohamed Malik

Course Title: Matte Painting & Camera Projection **Course Code: BAV501**	L	T	P	Credits
	4	0	0	4

Total Hours: 60

Unit I: Introduction to Matte Painting

a) Understanding the role of matte painting in visual effects and film production.
b) History and evolution of matte painting techniques.
c) Exploring traditional vs. digital matte painting methods.
d) Overview of software tools: Adobe Photoshop, Autodesk Maya, and Nuke.
e) Basic principles of composition, perspective, and color theory in matte painting.
f) Practical session: Creating a basic matte painting using Photoshop.

Unit II: Digital Painting Techniques

a) Advanced digital painting techniques for matte painting.
b) Creating realistic environments: skies, landscapes, and cityscapes.
c) Using reference images and textures to enhance realism.
d) Integrating photographic elements into digital paintings.
e) Matte painting for specific genres: fantasy, science fiction, and historical settings.
f) Practical session: Painting a complex environment with multiple elements.

Unit III: Camera Projection

a) Understanding the concept of camera projection and its applications.
b) Overview of camera mapping techniques in 3D software.
c) Preparing assets for camera projection: UV mapping and texture unwrapping.
d) Creating a camera projection setup in Maya or similar 3D software.
e) Matching 3D geometry with live-action footage using camera projection.
f) Practical session: Performing camera projection on a simple scene.

Unit IV: Advanced Techniques and Integration

a) Advanced matte painting techniques: adding depth, atmosphere, and detail.
b) Matte painting for moving shots: techniques for seamless integration.
c) Working with multi-pass renders and render layers for compositing.
d) Combining matte painting with live-action footage and CG elements.
e) Case studies and analysis of professional projects using matte painting and camera projection.
f) Practical session: Integrating a complex matte painting with live-action footage using camera projection.

Textbooks:

1. "The Digital Matte Painting Handbook" by David B. Mattingly
2. "Digital Painting Techniques: Practical Techniques of Digital Art Masters" edited by 3DTotal
3. "The Art and Science of Digital Compositing" by Ron Brinkmann
4. "Matchmoving: The Invisible Art of Camera Tracking" by Tim Dobbert

Course Title: Advanced Visual Effects	L	T	P	Credits
Course Code: BAV503	4	0	0	4

Total Hours: 60

Unit I: Advanced Compositing Techniques

   a) Advanced compositing workflows in industry-standard software (e.g., Nuke, After Effects)
   b) Integrating multiple elements into seamless compositions
   c) Matte painting integration and camera projections for realistic environments

Unit II: Advanced Particle Systems

a) Creating complex particle systems for realistic effects such as fire, smoke, and explosions
b) Advanced control over particle behavior, dynamics, and collisions
c) Optimizing particle simulations for efficiency and realism

Unit III: Advanced CGI Integration

a) Integrating computer-generated imagery (CGI) elements into live-action footage
b) Matchmoving and camera tracking for seamless CGI integration
c) Advanced lighting and shading techniques for realistic CGI rendering

Unit IV: Advanced Simulation Techniques

a) Advanced simulation techniques for fluid dynamics, cloth, hair, and fur
b) Creating realistic simulations of natural phenomena and complex materials
c) Optimizing simulations for high-quality rendering and efficiency

Unit V: Advanced Chroma Keying and Rotoscoping

a) Advanced chroma keying techniques for precise and clean keying
b) Rotoscoping for complex object extraction and motion tracking
c) Integrating keyed and rotoscoped elements into complex compositions

Unit VI: Advanced Motion Graphics

a) Advanced motion graphics techniques for dynamic and visually appealing animations
b) Complex animation techniques such as character rigging, IK/FK blending, and expressions
c) Integrating motion graphics with live-action footage and other visual effects elements

Unit VII: Advanced Lighting and Rendering

a) Advanced lighting setups for photorealistic rendering
b) Global illumination, ray tracing, and advanced rendering techniques
c) Optimizing render settings for high-quality output and efficient render times

Unit VIII: Stereoscopic 3D and Virtual Reality (VR)

a) Creating visual effects for stereoscopic 3D and VR projects
b) Understanding the unique challenges and considerations of 3D and VR workflows
c) Integrating VFX elements into immersive VR environments

Unit IX: Advanced Post-Production Techniques

a) Advanced post-production workflows for color grading and finishing
b) Creating cinematic looks and styles through color correction and grading
c) Output formats and delivery requirements for various distribution platforms

Unit X: Final Project

a) Applying advanced visual effects techniques to create a final project
b) Students will develop their own advanced visual effects sequence or scene, incorporating elements such as compositing, CGI integration, simulation, and motion graphics

Textbooks:

1. "The VES Handbook of Visual Effects: Industry Standard VFX Practices and Procedures" edited by Jeffrey A. Okun and Susan Zwerman
2. "Digital Compositing for Film and Video" by Steve Wright
3. "The Art and Science of Digital Compositing: Techniques for Visual Effects, Animation and Motion Graphics" by Ron Brinkmann
4. "Matchmoving: The Invisible Art of Camera Tracking" by Tim Dobbert

Course Title: Multimedia Systems

Course Code: BAV504
Total Hours: 30

L	T	P	Credits
2	0	0	2

Unit I: Introduction to Multimedia Systems

a) Definition and scope of multimedia systems.
b) Components of multimedia systems: text, graphics, audio, video, and animation.
c) Evolution and history of multimedia technology.
d) Applications of multimedia systems in various fields.
e) Practical session: Exploring different multimedia systems and their applications.

Unit II: Multimedia Data Representation

   a) Fundamentals of multimedia data types and formats.
   b) Digital representation of multimedia data: text, images, audio, and video.
   c) Data compression techniques for multimedia: lossless and lossy compression.
   d) Multimedia file formats and standards: JPEG, MP3, MPEG, MP4, etc.
   e) Practical session: Converting and compressing different types of multimedia data.

Unit III: Multimedia Hardware and Software

   a) Overview of multimedia hardware components: input devices, output devices, storage devices, and processing units.
   b) Multimedia software tools and applications: authoring tools, editing tools, and playback software.
   c) Operating systems and multimedia: support for multimedia features and performance optimization.
   d) Practical session: Setting up a multimedia workstation with appropriate hardware and software.

Unit IV: Multimedia Networking and Communication

   a) Principles of multimedia networking: protocols and standards.
   b) Streaming multimedia content over networks: techniques and challenges.
   c) Quality of Service (QoS) in multimedia communication.
   d) Multimedia communication protocols: RTP, RTCP, RTSP, and SIP.
   e) Practical session: Implementing and optimizing multimedia streaming over a network.

Textbooks:

   1. "Multimedia: Making It Work" by Tay Vaughan
   2. "Fundamentals of Multimedia" by Ze-Nian Li and Mark S. Drew
   3. "Digital Multimedia" by Nigel Chapman and Jenny Chapman
   4. "Multimedia Systems" by Ralf Steinmetz and KlaraNahrstedt

	L	T	P	Credits
	0	0	4	2

Course Title: Advanced Visual Effects (Lab)

Course Code:BAV505

Total Hours: 60

Unit I: Introduction to Advanced Visual Effects

    a) Overview of advanced visual effects techniques and their applications in the film industry.

    b) Understanding the pipeline of visual effects production.

    c) Introduction to industry-standard software: Autodesk Maya, SideFX Houdini, Adobe After Effects, and Foundry Nuke.

    d) Exploring different categories of visual effects: CGI animation, compositing, simulation, and matte painting.

    e) Practical session: Setting up project files and familiarizing with software interfaces.

Unit II: CGI Animation and Dynamics

    a) Advanced techniques for character animation and rigging in Maya.

    b) Creating realistic simulations: cloth, hair, and fluids.

    c) Introduction to particle systems and dynamics simulations.

    d) Understanding rigid body and soft body dynamics.

    e) Practical session: Creating a dynamic simulation with Maya's nCloth or Houdini's FLIP solver.

Unit III: Compositing and Integration

    a) Advanced compositing techniques for integrating CGI with live-action footage.

    b) Multi-pass rendering and render layer management.

    c) Advanced green screen keying and rotoscoping techniques.

    d) Creating seamless transitions and blending effects.

    e) Practical session: Compositing a CGI character into live-action footage using Nuke or After Effects.

Unit IV: Simulation and Effects

    a) Advanced simulations for natural phenomena: fire, smoke, water, and explosions.

    b) Introduction to procedural modeling and effects in Houdini.

    c) Understanding advanced particle systems and fluid simulations.

    d) Using dynamic simulations for destruction and physics-based effects.

    e) Practical session: Creating a complex dynamic simulation in Houdini.

Textbooks:

    1. "The Art and Science of Digital Compositing" by Ron Brinkmann

    2. "Digital Modeling" by William Vaughan

    3. "Houdini Foundations" by Robert Magee

4. "Nuke 101: Professional Compositing and Visual Effects" by Ron Ganbar

Course Title: Fundaments of Dynamics (Lab)

Course Code:BAV506
Total Hours: 60

L	T	P	Credits
0	0	4	2

Unit I: Introduction to Dynamics in Visual Effects

a) Understanding the role of dynamics in visual effects and animation.
b) Overview of physics simulation principles applied in CGI.
c) Introduction to software tools for dynamics simulation: Autodesk Maya, SideFX Houdini, and Blender.
d) Exploring different types of dynamics: rigid body dynamics, soft body dynamics, and particle systems.
e) Practical session: Setting up project files and familiarizing with software interfaces.

Unit II: Rigid Body Dynamics

a) Basic principles of rigid body dynamics: collision, gravity, and friction.
b) Creating dynamic simulations for simple objects: falling, rolling, and bouncing.
c) Understanding constraints and their role in rigid body dynamics.
d) Introduction to simulations with multiple interacting objects.
e) Practical session: Creating a dynamic simulation of dominoes falling and colliding.

Unit III: Soft Body Dynamics

a) Understanding soft body dynamics and deformable objects.
b) Creating simulations for cloth, rubber, and other soft materials.
c) Adjusting parameters for realistic deformation and motion.
d) Using dynamic simulations for character secondary motion.
e) Practical session: Creating a dynamic simulation of a flag waving in the wind.

Unit IV: Particle Systems

a) Introduction to particle systems and their applications in visual effects.
b) Creating simulations for natural phenomena: fire, smoke, water, and explosions.
c) Understanding particle attributes: position, velocity, and lifespan.
d) Using forces and fields to control particle behavior.
e) Practical session: Creating a particle-based fire and smoke simulation.

Textbooks:

1. "The Art of Rigging" by Lee Montgomery
2. "Mastering Autodesk Maya" by Todd Palamar

3. "Houdini Foundations" by Robert Magee
4. "Blender for Visual Effects" by Sam Vila

Course Title: 3D Simulations

Course Code: BAV507

Total Hours: 45

L	T	P	Credits
3	0	0	3

Unit I: Introduction to 3D Simulations

a) Understanding the fundamentals of 3D simulations in computer graphics.
b) Overview of simulation techniques and their applications in various industries.
c) Introduction to software tools for 3D simulations: SideFX Houdini, Autodesk Maya, and Blender.
d) Exploring different types of 3D simulations: dynamics, fluid, cloth, and particles.
e) Practical session: Setting up project files and becoming familiar with software interfaces.

Unit II: Dynamics Simulations

a) Understanding rigid body dynamics and its applications in 3D simulations.
b) Creating dynamic simulations for objects interacting with forces and collisions.
c) Introduction to soft body dynamics for simulating deformable objects.
d) Using constraints and fields to control and enhance dynamic simulations.
e) Practical session: Creating a dynamic simulation of falling objects and colliding with surfaces.

Unit III: Fluid Simulations

a) Introduction to fluid dynamics and its role in 3D simulations.
b) Creating realistic fluid simulations for water, smoke, fire, and explosions.
c) Understanding fluid solvers and their parameters for simulation control.
d) Using emitters, forces, and turbulence for shaping fluid behavior.
e) Practical session: Creating a fluid simulation of flowing water or a smoke plume.

Unit IV: Cloth Simulations

a) Understanding cloth simulation techniques for simulating fabrics and clothing.
b) Creating cloth simulations for various materials: silk, cotton, leather, etc.
c) Adjusting parameters for realistic cloth behavior: stiffness, damping, and stretch.
d) Using collision objects and constraints to interact with cloth simulations.
e) Practical session: Simulating a piece of cloth draped over a virtual object.

Textbooks:

1. "The Art of Rigging" by Lee Montgomery
2. "Mastering Autodesk Maya" by Todd Palamar
3. "Houdini Foundations" by Robert Magee
4. "Blender for Visual Effects" by Sam Vile

Course Title:3D Effects

Course Code: BAV508

Total Hours: 45

L	T	P	Credits
3	0	0	3

Unit I: Introduction to 3D Effects

a) Understanding the role and significance of 3D effects in visual media.
b) Overview of various types of 3D effects: particles, dynamics, fluids, and volumetrics.
c) Introduction to software tools for creating 3D effects: Autodesk Maya, SideFX Houdini, and Blender.
d) Exploring real-world applications of 3D effects in industries such as film, animation, gaming, and virtual reality.
e) Practical session: Setting up project files and becoming familiar with software interfaces.

Unit II: Particle Effects

a) Understanding particle systems and their behavior in 3D space.
b) Creating particle-based effects such as rain, snow, sparks, and explosions.
c) Controlling particle attributes such as position, velocity, and lifespan.
d) Using forces, fields, and emitters to shape particle motion.
e) Practical session: Creating particle effects for a dynamic scene.

Unit III: Dynamics Effects

a) Introduction to dynamics simulations for realistic physics-based effects.
b) Creating dynamic simulations for objects interacting with forces, collisions, and constraints.
c) Understanding rigid body dynamics for simulating solid objects.
d) Using soft body dynamics for simulating deformable objects like cloth and rubber.
e) Practical session: Simulating a dynamic destruction effect.

Unit IV: Fluid Effects

a) Exploring fluid dynamics and its applications in 3D effects.
b) Creating fluid simulations for water, smoke, fire, and explosions.
c) Understanding fluid solvers and adjusting simulation parameters.
d) Using emitters, forces, and turbulence to shape fluid behavior.
e) Practical session: Creating a realistic fluid simulation.

Textbooks:

1. "The Art of Rigging" by Lee Montgomery

2. "Mastering Autodesk Maya" by Todd Palamar

3. "Houdini Foundations" by Robert Magee

4. "Blender for Visual Effects" by Sam Vila

	L	T	P	Credits
	4	0	0	4

Course Title: Media Laws and Ethics
Course Code: BAV601
Total Hours: 60

Unit I: Introduction to Media Laws and Ethics

a) Understanding the importance of media laws and ethics in journalism and communication.
b) Overview of the legal and regulatory frameworks governing media practices.
c) Exploring the historical evolution of media laws and ethical standards.
d) The role of media in shaping public opinion and the need for ethical journalism.
e) Practical case studies highlighting the impact of media laws and ethics on society.

Unit II: Freedom of Speech and Press Freedom

a) Understanding the concepts of freedom of speech and press freedom.
b) Exploring the legal protections and limitations of free speech in different jurisdictions.
c) The role of the media in holding governments and institutions accountable.
d) Challenges to press freedom: censorship, media ownership, and government control.
e) Practical exercises on navigating ethical dilemmas related to freedom of speech and press freedom.

Unit III: Legal and Ethical Considerations in Journalism

a) Understanding defamation laws and the concept of libel and slander.
b) Ethical considerations in reporting sensitive topics: privacy, consent, and confidentiality.
c) Copyright law and fair use: principles and guidelines for media professionals.
d) Balancing public interest with individual rights in journalistic practices.
e) Practical application of legal and ethical principles in news reporting and storytelling.

Unit IV: Media Regulation and Self-Regulation

a) Overview of media regulation bodies and agencies at national and international levels.
b) Understanding the role of self-regulatory bodies and codes of conduct in the media industry.
c) Case studies on the effectiveness and limitations of media regulation and self-regulation.
d) Exploring emerging challenges in media regulation: online platforms, social media, and misinformation.

e) Practical exercises on ethical decision-making and compliance with media regulations.

Textbooks:

1. "Media Law and Ethics" by Roy L. Moore and Michael D. Murray
2. "Mass Media Law" by Pember and Calvert
3. "The Ethical Journalist: Making Responsible Decisions in the Digital Age" by Gene Foreman
4. "The Elements of Journalism: What Newspeople Should Know and the Public Should Expect" by Bill Kovach and Tom Rosenstie

Course Title: Multimedia Security	L	T	P	Credits
Course Code: BAV602	4	0	0	4

Course Title: Multimedia Security
Course Code: BAV602
Total Hours: 60

Unit I: Introduction to Multimedia Security
a) Overview of multimedia security: definitions and importance.
b) Understanding multimedia content types: text, audio, images, and video.
c) Threats and vulnerabilities in multimedia systems.
d) Basic principles of information security applied to multimedia.
e) Practical session: Introduction to multimedia security tools and software.

Unit II: Cryptography for Multimedia
a) Fundamentals of cryptography: symmetric and asymmetric encryption.
b) Key management and cryptographic protocols.
c) Encrypting and decrypting multimedia data.
d) Steganography: hiding information within multimedia content.
e) Practical session: Implementing basic encryption and decryption of multimedia files.

Unit III: Digital Watermarking and Fingerprinting
a) Introduction to digital watermarking: concepts and techniques.
b) Applications of watermarking in copyright protection and authentication.
c) Types of digital watermarks: visible and invisible.
d) Digital fingerprinting: identifying and tracking multimedia content.
e) Practical session: Creating and embedding digital watermarks in images and videos.

Unit IV: Multimedia Authentication and Integrity
a) Ensuring the authenticity and integrity of multimedia content.
b) Techniques for detecting tampering and forgery.
c) Hash functions and digital signatures for multimedia authentication.
d) Case studies on multimedia integrity attacks and defenses.
e) Practical session: Implementing integrity checks and authentication mechanisms.

Textbooks:

1. "Multimedia Security: Watermarking, Steganography, and Forensics" by Frank Y. Shih
2. "Introduction to Multimedia Security" by Chun-Shien Lu
3. "Digital Watermarking and Steganography" by Ingemar J. Cox, Matthew L. Miller, Jeffrey A. Bloom
4. "Applied Cryptography: Protocols, Algorithms, and Source Code in C" by Bruce Schneier

Course Title: Entrepreneurship Development	**L**	**T**	**P**	**Credits**
Course Code: BAV603	**2**	**0**	**0**	**2**

Total Hours: 30

Unit I: Introduction to Entrepreneurship

a) Definition and characteristics of entrepreneurship.
b) Types of entrepreneurs and entrepreneurial ventures.
c) The role of entrepreneurship in economic development.
d) Understanding the entrepreneurial mindset and motivation.
e) Case studies of successful entrepreneurs.
f) Practical session: Identifying entrepreneurial traits and skills through self-assessment.

Unit II: Opportunity Identification and Feasibility Analysis

a) Techniques for identifying and evaluating business opportunities.
b) Conducting market research and competitive analysis.
c) Understanding customer needs and market demand.
d) Feasibility analysis: technical, financial, and operational feasibility.
e) Practical session: Developing a feasibility study for a business idea.

Unit III: Business Planning and Development

a) Importance of a business plan and its components.
b) Writing a comprehensive business plan: executive summary, business model, market strategy, operations plan, and financial projections.
c) Risk analysis and contingency planning.
d) Practical session: Creating a business plan for a startup idea.

Unit IV: Financing the Entrepreneurial Venture

a) Sources of financing: self-funding, loans, angel investors, venture capital, and crowdfunding.
b) Preparing financial statements and projections.
c) Understanding funding rounds and investor relations.
d) Practical session: Pitching a business idea to potential investors.

Textbooks:

1. "Entrepreneurship: Theory, Process, and Practice" by Donald F. Kuratko
2. "The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses" by Eric Ries

3. "Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers" by Alexander Osterwalder and Yves Pigneur
4. "The Art of the Start 2.0: The Time-Tested, Battle-Hardened Guide for Anyone Starting Anything" by Guy Kawasaki

Course Title: Muscle System	L	T	P	Credits
Course Code: BAV604	0	0	6	3

Course Title: Muscle System
Course Code: BAV604
Total Hours: 45

Unit I: Introduction to Muscle Simulation in Animation

a) Overview of muscle simulation techniques in computer animation.
b) Importance of muscle dynamics in character animation.
c) Understanding the principles of biomechanics and muscle behavior.
d) Introduction to software tools for muscle simulation: Autodesk Maya, Blender, and Ziva Dynamics.
e) Practical session: Setting up a basic character rig for muscle simulation.

Unit II: Anatomy of the Muscular System for Animation

a) Detailed study of human muscular anatomy relevant to animation.
b) Understanding muscle groups, origins, insertions, and actions.
c) Muscle deformation and movement: flexion, extension, abduction, and adduction.
d) Analyzing reference footage and anatomy resources for animation.
e) Practical session: Sculpting and rigging muscles on a character model.

Unit III: Muscle Simulation Techniques

a) Overview of different approaches to muscle simulation: dynamic, kinematic, and hybrid.
b) Understanding muscle dynamics solvers and their parameters.
c) Muscle contraction and relaxation: keyframes vs. procedural simulation.
d) Techniques for achieving realistic muscle deformations and movement.
e) Practical session: Rigging and simulating muscles on a character model.

Unit IV: Integration with Character Animation

a) Principles of integrating muscle simulation with character animation.
b) Workflow for incorporating muscle dynamics into animation rigs.
c) Techniques for blending muscle dynamics with traditional animation poses.
d) Challenges and solutions in animating complex muscle interactions.
e) Practical session: Animating a character with simulated muscles in various movements.

Textbooks:

1. "Stop Staring: Facial Modeling and Animation Done Right" by Jason Osipa

2. "Character Animation Crash Course!" by Eric Goldberg

3. "The Animator's Survival Kit" by Richard Williams

Course Title: 3d Animation Project	L	T	P	Credits
Course Code: BAV605	0	0	6	3

Course Title: 3d Animation Project

Course Code: BAV605

Total Hours: 45

Unit I: Project Planning and Concept Development

a) Understanding the fundamentals of 3D animation project management.
b) Identifying project goals, objectives, and target audience.
c) Brainstorming and developing animation concepts and storyboards.
d) Creating project timelines, milestones, and deliverables.
e) Practical session: Developing a project proposal and storyboard for the animation project.

Unit II: Character Design and Development

a) Principles of character design for animation: anatomy, proportions, and style.
b) Sketching and conceptualizing characters based on the project requirements.
c) Refining character designs through iterations and feedback.
d) Creating character turnarounds and model sheets.
e) Practical session: Designing and modeling characters for the animation project.

Unit III: Environment Design and Asset Creation

a) Designing environments and backgrounds for the animation project.
b) Conceptualizing and sketching key locations and settings.
c) Modeling and texturing environment assets: props, landscapes, and architecture.
d) Creating reusable assets and optimizing workflow efficiency.
e) Practical session: Modeling and texturing environment assets for the animation project.

Unit IV: Rigging and Animation

a) Rigging characters and objects for animation.
b) Understanding the principles of rigging: joints, controls, and deformers.
c) Planning and blocking out animation sequences.
d) Techniques for creating appealing character poses and movements.
e) Practical session: Rigging characters and animating key scenes for the animation project.

Textbooks:

1. "The Animator's Survival Kit" by Richard Williams

2. "Character Animation Crash Course!" by Eric Goldberg

3. "Digital Lighting and Rendering" by Jeremy Birn

4. "The Art of 3D Computer Animation and Effects" by Isaac Kerlow

Course Title: Text And Image Compression	L	T	P	Credits
Course Code: BAV606	3	0	0	3

Course Title: Text And Image Compression
Course Code: BAV606
Total Hours: 45

Unit I: Introduction to Compression Techniques

a) Understanding the fundamentals of data compression.
b) Overview of compression algorithms and techniques.
c) Types of compression: lossless and lossy compression.
d) Applications of compression in text and image data.
e) Practical session: Exploring basic compression algorithms and their implementation.

Unit II: Text Compression Techniques

a) Introduction to text compression methods: Huffman coding, Lempel-Ziv-Welch (LZW), and Run-Length Encoding (RLE).
b) Understanding dictionary-based compression algorithms.
c) Text compression standards: ASCII, Unicode, and UTF-8.
d) Evaluating compression efficiency and performance.
e) Practical session: Implementing Huffman coding and LZW compression for text data.

Unit III: Image Compression Techniques

a) Overview of image compression principles and methods.
b) Understanding raster and vector graphics.
c) Introduction to lossless image compression algorithms: PNG and GIF.
d) Lossy image compression techniques: JPEG compression and its variants.
e) Practical session: Compressing images using JPEG and PNG compression algorithms.

Unit IV: Transform-based Compression

a) Principles of transform-based compression techniques.
b) Introduction to discrete cosine transform (DCT) and its applications in image compression.
c) Understanding wavelet transforms and their use in compression.
d) Comparing transform-based compression with other compression methods.
e) Practical session: Implementing DCT-based image compression.

Textbooks:

1. "Introduction to Data Compression" by Khalid Sayood
2. "JPEG: Still Image Data Compression Standard" by William B. Pennebaker and Joan L. Mitchell
3. "Understanding Compression: Data Compression for Modern Developers" by Colt McAnlis and AleksHaecky
4. "Introduction to Image Compression" by Malvar, H., and L. Heidelberg

Course Title: Audio And Video Compression	L	T	P	Credits
Course Code: BAV607	3	0	0	3

Course Title: Audio And Video Compression
Course Code: BAV607
Total Hours: 45

Unit I: Introduction to Audio and Video Compression

a) Understanding the principles and importance of audio and video compression.
b) Overview of audio and video compression formats and codecs.
c) Introduction to lossless and lossy compression techniques.
d) Applications of audio and video compression in multimedia technology.
e) Practical session: Exploring common audio and video compression formats.

Unit II: Audio Compression Techniques

a) Fundamentals of audio compression: perceptual coding and psychoacoustics.
b) Introduction to audio compression standards: MP3, AAC, and OggVorbis.
c) Understanding the principles of lossy audio compression.
d) Evaluating audio compression quality and bitrate.
e) Practical session: Compressing audio files using different codecs and settings.

Unit III: Video Compression Techniques

a) Principles of video compression: spatial and temporal redundancy.
b) Introduction to video compression standards and codecs: MPEG-2, MPEG-4, and AVC/H.264.
c) Understanding intra-frame and inter-frame compression techniques.
d) Evaluating video compression efficiency and quality.
e) Practical session: Compressing video files using popular codecs and settings.

Unit IV: Advanced Video Compression

a) Introduction to High-Efficiency Video Coding (HEVC/H.265).
b) Understanding the improvements and enhancements in HEVC over previous standards.
c) Techniques for achieving higher compression ratios and improved visual quality.
d) Comparing HEVC with other video compression standards.
e) Practical session: Encoding and decoding videos using HEVC.

Textbooks:

1. "Digital Audio Compression: Principles and Applications" by Charles S. Watson

2. "The MPEG Representation of Digital Media" by Leonardo Chiariglione

3. "Video Compression Techniques: A Review" by VasudevBhaskaran and Konstantinos Konstantinides

4. "Streaming Media Architectures, Techniques, and Applications: Recent Advances" by Dhiraj Joshi and Zaigham Mahmood

Course Title: Multimedia Communications	L	T	P	Credits
Course Code: BAV608	2	0	0	2

Course Title: Multimedia Communications

Course Code: BAV608
Total Hours: 30

Unit I: Introduction to Multimedia Communications

a) Understanding the principles and components of multimedia communication.
b) Overview of multimedia communication technologies and applications.
c) The role of multimedia in enhancing communication experiences.
d) Challenges and opportunities in multimedia communications.
e) Practical session: Exploring multimedia communication tools and platforms.

Unit II: Multimedia Data Representation

a) Fundamentals of multimedia data representation: text, image, audio, and video.
b) Introduction to multimedia file formats and codecs.
c) Understanding compression techniques for multimedia data.
d) Techniques for multimedia data synchronization and integration.
e) Practical session: Encoding and decoding multimedia data using different formats and codecs.

Unit III: Multimedia Networking Protocols

a) Overview of multimedia networking protocols: TCP/IP, UDP, RTP, and RTSP.
b) Introduction to streaming protocols: HLS, MPEG-DASH, and RTMP.
c) Techniques for reliable and real-time multimedia data transmission.
d) Quality of Service (QoS) considerations in multimedia networking.
e) Practical session: Setting up a multimedia streaming server and client.

Unit IV: Multimedia Transmission over Networks

a) Understanding the challenges and requirements of multimedia transmission over networks.
b) Techniques for congestion control and bandwidth management.
c) Adaptive bitrate streaming and dynamic adaptive streaming over HTTP (DASH).
d) Multimedia multicast and broadcast protocols.
e) Practical session: Simulating multimedia transmission over different network conditions.

Textbooks:

1. "Multimedia Communications: Applications, Networks, Protocols and Standards" by Fred Halsall

2. "Multimedia Systems: Algorithms, Standards, and Industry Practices" by Parag

Havaldar and Gerard Medioni

3. "Digital Multimedia" by Nigel Chapman and Jenny Chapman
4. "Streaming Media Architectures, Techniques, and Applications: Recent Advances" by Dhiraj Joshi and Zaigham Mahmood