Karmaveer Bhaurao Patil University, Satara

Syllabus for
M. Sc. II (Animation Science)

Under
Faculty of Science & Technology and Technology
(As per NEP 2020)

With effect from Academic Year 2025-2026

Preamble:

Animation science is the most emerging and fast-growing industries in India and the whole world is taking notice of the efficiency, skill, and talent available in the country in these fields. The introduction of formal and professional level training programs and courses at the university and college levels is necessary to support the continued expansion of these industries and to produce highly qualified and trained professionals. This industry includes an important portion of animation, and this degree is being offered to train people in the field of animation, which is now an integral aspect of many different industries and finds applications in fields other than animation science. For this revolution in technology, scientific faculty students need also be prepared. The students from science faculty should also be competent for this change in the technology.

Course Objective:

1.The primary objective of this course is to provide students with a strong foundation in the principles, tools, and technologies of animation while integrating scientific and technical skills.
2.The program aims to prepare students for careers in various animation-driven industries such as entertainment, education, healthcare, engineering simulations, and scientific visualization, ensuring they can adapt to evolving digital and technological trends.

Course Outcomes:

Upon successful completion of this course, students will be able to:

1. Demonstrate foundational knowledge of animation techniques, including 2D and 3D animation, motion graphics, and VFX.
2. Understand and apply scientific principles (such as physics, biology, or computer science) to create realistic and technically accurate animations.
3. Use industry-standard software tools (e.g., Autodesk Maya, Blender, Adobe Suite, Unity, Unreal Engine) for designing and producing animation content.
4. Create interdisciplinary animation projects that can be applied in fields such as medicine, engineering, environmental science, and education.
5. Collaborate effectively in teams to conceptualize, design, and produce complete animation works, reflecting professional industry practices.
6. Understand the business, legal, and ethical aspects of the animation and media industry, including intellectual property rights and content licensing.
7. Adapt to emerging technologies such as AR/VR, AI-assisted animation, and real-time rendering, staying current with industry advancements.

- **Evaluation Structure:**

Semester III

Course	Course Category	Course Code	Internal Evaluation				ESE	Total Marks	Credits
			CCE-I	Mid-Semester	CCE- II	Activity			
DSC	T	M*T 531	10	10	10	10	60	100	04
	T	M*T 532	10	10	10	10	60	100	04
	T	M*T 533	10	10	10	10	60	100	04
	P	M*P 535	--	--	--	--	50	50	02
DSE (1 Theory Papers Out of Two)	T	M*T 534	05	05	05	05	30	50	02
	T	M*T 534	05	05	05	05	30	50	02
RP	P	M*P 536	--	--	--	--	150	150	06
Total								**550**	**22**

Semester IV

Course	Course Category	Course Code	Internal Evaluation				ESE	Total Marks	Credits
			CCE-I	Mid-Semester	CCE- II	Activity			
DSC	T	M*T 541	10	10	10	10	60	100	04
	T	M*T 542	10	10	10	10	60	100	04
	T	M*T 543	10	10	10	10	60	100	04
	P	M*P 545	--	--	--	--	50	50	02
DSE (1 Theory Papers Out of Two)	T	M*T 544	05	05	05	05	30	50	02
	T	M*T 544	05	05	05	05	30	50	02
	P	M*P 536	--	--	--	--	50	50	02
OJT	P	M*P 537	--	--	--	--	100	100	04
Total								**550**	**22**

DSC: Discipline Specific Course; DSE: Discipline Specific Elective RM: Research Methodology; OJT: On Job Training; RP: Research Project; T: Theory; P: Practical

Course Structure: M.Sc. – II

Semester – III

Level	Semester	Course Code	Course Title	Credits
6.5	III	MAST 531	Advanced 2d Production Process	4
		MAST 532	Game Design	4
		MAST 533	Advanced Visual Effects	4
		MAST 534 E-I MAST 534 E-II	E-I) Business Development E- II) AI Tools and Techniques	2
		MASP 535	LAB- III (based on MAST-531, 532 and 533)	2
		MASP 536	Research Project	6

Semester –IV

Level	Semester	Course Code	Course Title	Credits
6.5	IV	MAST 541	3d Game Development	4
		MAST 542	Animation for AR And VR	4
		MAST 543	Advanced Compositing	4
		MAST 544 E-I MAST 544 E-II	E-I) Creative Advertising & Branding E-II) UI UX Designing	4
		MASP 545	LAB- IV (based on MAST- 541, 542 and 543)	2
		MASP 546	On Job Training (OJT)	4

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(A State Public University Est. u/s 3(6) of MPUA 2016)

Faculty of Science & Technology

Yashawantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: M. Sc -II	**Semester** - III
Type : Major	**Marks: 60**
Credits : 4	**From: A.Y.2025-26**

Name of the Course: MAST 531: ADVANCED 2D PRODUCTION PROCESS

Course Objectives:

1. Understand 2D traditional pre-production and production process.
2. Study the system of columns and levels in detail.
3. Aware of freeware applications for making animation.
4. Learn drawings for traditional & digital 2D animation production.

Course Outcomes:

1.Describe concepts, storyboarding and production pipeline of 2 dimensional animations.
2.Identify Principles of animation for 2D animation project.
3.Differentiate sfx effects for 2D Animation project.
4.Create 2D animation render video.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Production Workflow & Interface** 1.1 Traditional Workflow, Paperless Workflow, Interface Overview, Using Rooms, Room Panes, Customizing the Interface Appearance 1.2 Managing Projects, Setting up Projects, 1.3 Setting Up a Scene, Scanning Paper Drawings, Saving and Loading Cleanup Settings	**15**
Module -2:	**Module -2: Drawing Tools & Applying Effects** 2.1 Drawing Animation Levels, Drawing Tools, Changing the Canvas Size 2.2 Editing Drawings, Animation Techniques 2.3 Editing Animation Levels, Applying Effects, Create animations using Plastic tool.	**15**
Module -3:	**Module -3: Palettes and Styles** 3.1 Managing Palettes and Styles, The Palette Editor, 3.2 Animating Palettes, Editing Styles, Painting Tools, 3.3 Using a Color Model, Working in Xsheet/Timeline.	**15**
Module -4:	**Module -4: Working with Rendering** 4.1 Working with Columns/Layers, Working with Cells, Working Globally with Frames, 4.2 Creating a Soundtrack, Lip Syncing, Saving and Loading Scenes, 4.3 Creating Movements, Using the Skeleton Tool, Previewing and Rendering.	**15**

Reference Books:-

1. Blair, Preston. 2020. Cartoon Animation: Learn Techniques for Drawing and Animating Cartoon Characters. Revised edition. November 2020.

2. OpenToonz. 2022. OpenToonz Documentation Release 1.6.0. October 16, 2022.

3. Roberts, Steve. 2011. Character Animation Fundamentals: Developing Skills for 2D and 3D Character Animation. September 20, 2011.
4. Toonz. Toonz Paperless Workflow: For Toonz Harlequin & Toonz Bravo. n.d.

Evaluation Pattern:	
Total Marks: 100	
Internal Continuous Evaluation: • ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	**End Semester Examination:** • Question -1(02 Marks = 2x6=12 Marks) • Question -2(02 Marks = 6x2=12 Marks) • Question -3(02 Marks = 6x2=12 Marks) • Question -4(02 Marks = 6x2=12 Marks) • Question -5(02 Marks = 4x3=12 Marks) • Question -6(02 Marks = 4x3=12 Marks) Question -7(02 Marks = 4x3=12 Marks)

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Board of Studies in Animation Science

Programme: M. Sc - II	**Semester** - III
Type : Major	**Marks: 60**
Credits : 4	**From: A.Y.2025-26**

Name of the Course: MAST 532: GAME DESIGN

Course Objectives:

1.Understand complex game API software environment with Object-Oriented Programming skills
2.Study of innovative ideas and technics for game designing.
3.Aware of principles guiding visual, audio.
4.Learn foundational theories and approaches.

Course Outcomes:

1. Describe the scripting of game designing.
2.Identify the materials for 2d games.
3.Utilize the process of building the game for publication.
4.Describe the basic game props and environment scene.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Interface** 1.1Introduction of Unity, Unity Project, 1.2Unity Projects, Assets, and Scenes, 1.3Assets and Project Files Navigating Scenes and Viewports.	**15**
Module -2:	**Module -2 Scripting** 2.1 Game Objects, Transforms, and Components Cameras 2.2 Scripting and the Unity API, Performance, 2.3 Profiling, and the Stats Panel	**15**
Module -3:	**Module -3: Materials and Textures** 3.1Materials and Textures, Mesh Renderers, Shades, 3.2Materials for 2D Games, Method 3.3Use White Ambient Light Method 2: Use Light-Immune Shaders	**15**
Module -4:	**Module -4: Two Dimensional games** 4.1Creating Textures Power-2 Dimensions, 4.2Retain Quality, Expand 4.3Alpha Channels for Transparency	**15**

Reference Books:-

1. Sue Blackman “Beginning 3D Game Development with Unity 4: All-in-One, Multi-Platform Game Development” by 2013.
2. Jon Manning, Paris Buttfield-Addison, and Tim Nugent, Unity Game Development Cookbook: Essentials for Every Game, O’Reilly Media, Inc.
3. Jared Halpern, Developing 2D Games with Unity: Independent Game Programming with C#, Apress, Final Editio.
4. Frank D. Luna “Introduction to 3D Game Programming with DirectX® 12” 2016.

Evaluation Pattern:	
Total Marks: 100	
Internal Continuous Evaluation: • ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	**End Semester Examination:** • Question -1(02 Marks = 2x6=12 Marks) • Question -2(02 Marks = 6x2=12 Marks) • Question -3(02 Marks = 6x2=12 Marks) • Question -4(02 Marks = 6x2=12 Marks) • Question -5(02 Marks = 4x3=12 Marks) • Question -6(02 Marks = 4x3=12 Marks) Question -7(02 Marks = 4x3=12 Marks)

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Programme: M.Sc.II	**Semester** - III
Type : Major	**Marks: 60**
Credits : 4	**From: A.Y.2025-26**

Name of the Course: MAST 533Advanced Visual Effects

Course Objectives:

1. Classify tracking techniques.
2.Recognize camera extraction.
3.Understand the procedure of 2d & 3d tracking.
4.Interpret the process of compositing packages

Course Outcomes:

1.Design promotional Products.
2.Understand Film Criticism and reviews.
3.Demonstrate Photographic Principles.
4.Differentiate visual effects.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Working with Interface** 1.1 Understanding workflow of software, working with multiple image file format, compositing in 3D, Nuke Studio environment, customizing workspace, Preferences, 1.2 Using the Compositing Environment, Toolbar, Menu Bar, and Content Menus, Working with Nodes, 1.3 Customizing the Node Display, Using the Tab Menu, Navigating Node Graph, 1.4Properties Panels, customizing a Node's Presets, Animating Parameters, Dope Sheet..	**15**
Module -2:	**Module -2 Assembly in Nuke** 2.1 Compositing Viewers, Viewer Controls, Viewer Selection Modes, Soft Selection, Pixel Aspect Ratio, 2.2Full-frame processing, Region of Interest (ROI), Viewer Overlays and Input Processes, File Browser, 2.3Nuke Studio's Timeline Environment, 2.4Shots, Clip and Shot Properties, Setting Clip Frame Rates, Ingesting Media, Color-coding Source Clips and Shots, Reconnecting and Refreshing Clips 2.5Timeline Playback Tools, Playback Controls, Timeline Viewer Tools, In and Out Markers.	**15**
Module -3:	**Module -3: Compositing with Nuke** 3.1Working with Colorspaces, Scopes, Histogram, Waveform, Vector, Proxy Mode, Reformatting Image Sequences, Reformatting Elements, 3.2Cropping Elements, Understanding Channels and Layers, Selecting Masks, Merging Images, Merge Operations, Generating Contact Sheets, Removing Noise with Denoise, 3.3Fine Tuning, Keying with ChromaKeyer, Improving Mattes, 3.4Color Replacement, Keying with Cryptomatte, Keying with Keylight,	**15**

Module -4:	**Module -4: Rendering in Nuke** 4.1Biasing, PreBlur and Tuning, Screen Processing, Clean BG Noise, using RotoPaint, Drawing Paint Strokes, 4.2Drawing Shapes, Tracking and Stabilizing, 4.3Automatic vs. Keyframe Tracking,Transforming Elements, Wrapping images, working with color, Filtering and Spatial effects, creating effects, analyzing and matching clips, 4.4classic 3D composition, importing objects from other application, USD in nuke, deep compositing, Audio in Nuke, previews and rendering, script editor and python, Advanced composition.	**15**

Reference Books:-

1. Brinkmann, Ron. The art and science of digital compositing: Techniques for visual effects, animation and motion graphics. Morgan Kaufmann, 2008.
2. Freeman, Heather D. The Moving Image Workshop: Introducing animation, motion graphics and visual effects in 45 practical projects. Bloomsbury Publishing, 2015.
3. Christiansen, Mark. Adobe After Effects CC Visual Effects and Compositing Studio Techniques. Adobe Press, 2013.
4. Goulekas, Karen. Visual Effects in a Digital World: A Comprehensive Glossary of over 7000 Visual Effects Terms. Elsevier, 2001.

Evaluation Pattern:

Total Marks: 100

Internal Continuous Evaluation:	**End Semester Examination:**
• ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	• Question -1(02 Marks = 2x6=12 Marks) • Question -2(02 Marks = 6x2=12 Marks) • Question -3(02 Marks = 6x2=12 Marks) • Question -4(02 Marks = 6x2=12 Marks) • Question -5(02 Marks = 4x3=12 Marks) • Question -6(02 Marks = 4x3=12 Marks) Question -7(02 Marks = 4x3=12 Marks)

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Programme: M. Sc -II	**Semester** - III
Type : Elective	**Marks: 60**
Credits : 2	**From: A.Y.2025-26**

Name of the Course: MAST 534 E I: BUSINESS DEVELOPMENT

Course Objectives:

1. Study the types of Animation Industry
2.Understand Business Fundamentals and techniques.
3.Aware of fundamental Marketing and Promotion.
4.Learn Intellectual Property Management.

Course Outcomes:

1. Study Business Acumen.
2.Aware of proficiency in identifying and utilizing distribution channels and monetization models.
3.Learn marketing and Promotion Strategies.
4.Understand Professional Networking and industry collaborations.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Introduction to Animation Business** 1.1Overview of the animation industry, Importance of business development in animation, Key players in the animation ecosystem, 1.2Trends and challenges in the animation business, Market Analysis and Target Audience, Conducting market research in the animation industry, 1.3Identifying target audiences for different types of animation content, Understanding audience preferences and trends, Analyzing competitors and industry benchmarks	**15**
Module -2:	**Module -2 Business Strategies and Planning** 2.1 Developing a business plan for an animation project or company, Identifying revenue streams in animation (licensing, merchandising, distribution, etc.), 2.2 Creating marketing and promotional strategies for animation projects, Budgeting and financial planning for animation production, Networking and Partnerships, 2.3 Building a professional network in the animation industry, Collaborating with other companies, studios, and organizations, 2.4 Negotiating deals and partnerships in animation business, Leveraging industry events and conferences for networking opportunities	**15**

Reference Books:-

1. **Kennedy, Anna.** Business Development For Dummies. 1st ed. Hoboken, NJ: Wiley, 2015.
2. **Watkin, Tom.** Business Development Begins Here. 2nd ed. Virginia Beach, VA: Koehler Books, 2022.
3. **Gray, Anthony.** Business Development Body of Knowledge (BD-BOK): Business Development Professional (BDP) Certification Handbook. 1st ed. [City of publication]:

Gx COR, LLC, 2023	
Evaluation Pattern:	
Total Marks: 100	
Internal Continuous Evaluation: • ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	**End Semester Examination:** • Question -1(02 Marks = 2x5=10 Marks) • Question -2(05 Marks = 5x2=10 Marks) • Question -3(05 Marks = 5x2=10 Marks)

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Programme: M. Sc - II	**Semester** - III
Type : Elective	**Marks: 60**
Credits : 2	**From: A.Y.2025-26**

Name of the Course: MAST 534 E II: AI Tools and Techniques

Course Objectives:

1. Understand history and application
2.Understanding of intelligent systems for autonomous animation
3.Analyze the role of AI tools and techniques in enhancing animation production
4.encourage ethical awareness and responsible use of AI technologies within the animation and media production fields.

Course Outcomes:

1 Define key concepts, terminology and historical development of Artificial Intelligence in the context of animation.
2. Explain the working principles of AI tools and techniques used in modern animation pipelines
3. Apply AI-based techniques such as motion capture enhancement, style transfer and crowd simulation in animation projects.
4. Analyze the impact of AI-driven automation on traditional and digital animation production workflows.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Fundamentals of Artificial Intelligence in Media** 1.1 Introduction to AI: Concepts, History and Applications 1.2 Types of AI: Narrow AI, General AI, Machine Learning, Deep Learning 1.3 Overview of AI in Creative Industries (Animation, Games, Film) 1.4 AI vs Traditional Animation Techniques Ethical Considerations and Challenges of AI in Art and Animation	**15**
Module -2:	**Module -2: AI Tools and Techniques in Animation Production** 2.1Procedural Content Generation (PCG) using AI 2.2Neural Networks and Deep Learning for Image and Animation Creation 2.3AI-based Character Rigging and Motion Capture Enhancement 2.4Generative Adversarial Networks (GANs) in Animation (Character and Environment Generation) 2.5Style Transfer Techniques for Animation (e.g., turning videos into painted animation	**15**

Reference Books:-

1. Artificial Intelligence in Animation", formatted in proper Chicago style (author-date format, widely used for academic courses):
2. Russell, Stuart J., and Peter Norvig. Artificial Intelligence: A Modern Approach. 4th ed. Hoboken, NJ: Pearson, 2020.
3. Goodfellow, Ian, Yoshua Bengio, and Aaron Courville. Deep Learning. Cambridge, MA: MIT Press, 2016.
4. Flavell, John. Artificial Intelligence in Animation: Using Machine Learning to Create Intelligent Characters. 1st ed. Boca Raton, FL: CRC Press, 2022.

Evaluation Pattern:	
Total Marks: 100	
Internal Continuous Evaluation: • ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	**End Semester Examination:** • Question -1(02 Marks = 2x5=10 Marks) • Question -2(05 Marks = 5x2=10 Marks) • Question -3(05 Marks = 5x2=10 Marks)

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Programme: M.Sc.II	**Semester** - III
Type : Major Pracrticals	**Marks:**
Credits : 4	**From: A.Y.2025-26**

Name of the Course: MASP 535 Practical (Based on MAST 531,532,533 courses)

Course Objectives:

1.classify tracking techniques.
2.recognize camera extraction.
3.learn indexing and slicing to access data in Python programs.
4.aware of structure and components of a Python program**.**

Course Outcomes:

1.utilize user design principle for the designing of user interface.

2.identify different interaction styles.

3.differentiate python program with control flow statements.

4.describe proficiency in the handling of data structure and function

Module	Title and Contents	Hrs
Module -1:	1. Tracing characters and backgrounds with different layers in opentoonz.	**(30)**
	2. Eye blinking & lip synchronization in opentoonz.	
	3. Facial expressions dialogue.	
	4. Parallax camera movement animation with mountain view & city.	
	5. Basic human walk cycle.	
	6. Basic Animal walk cycle.	
	7. Sneak Thief walk cycle.	
	8. Human run cycle.	
	9. Animal run cycle.	
	10. Create a scene with action & dialogue.	
	11. Import character in Unity Software.	
	12. Animation character in Unity Software.	
	13. Apply to material in Unity Software.	
	14. Create environment background in Unity Software.	
	15. Reading in footage and project setting in Nuke.	
	16. Remove green screen using nuke software.	
	17. Creating a Tornado effect in Nuke.	
	18. Creating a live action torch shot with animated meshes.	
	19. Compositing fire in nuke.	
	20. Rotoscoping with Nuke.	

Reference Books:-

1.Preston Blair, “Cartoon Animation with Revised Edition, Learn techniques for drawing and animating cartoon characters”, November 2020.
2.Steve Roberts, “Character Animation Fundamentals: Developing Skills for 2D and 3D Character Animation”, 20 September 2011
3.Christiansen, Mark. Adobe After Effects CC Visual Effects and Compositing Studio Techniques. Adobe Press, 2013.
4.Goulekas, Karen. Visual Effects in a Digital World: A Comprehensive Glossary of over 7000 Visual Effects Terms. Elsevier, 2001.

Evaluation Pattern:	
Total Marks:	
Internal Evaluation: 20 Marks	**ESE Practical: 30 Marks**

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Programme: M. Sc - II	**Semester** - III
Type :	**Marks: 100**
Credits : 6	**From: A.Y.2025-26**

Name of the Course: Research Project

Research Project

Students will undertake research in specific area of his Major/Core with an advisory supported by a teacher/Faculty member. Students are required to take 6 credit Research Project for semester III under the guidance of faculty members.

Evaluation Pattern:

Presentation	Viva	Spiral	Model Demonstration/Paper Presentation
30 M	30M	20M	20M

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Programme: M.Sc.II	**Semester** - IV
Type : Major	**Marks: 60**
Credits : 4	**From: A.Y.2025-26**

Name of the Course: MAST 541: 3D GAME DEVELOPMENT

Course Objectives:

1. Understand the principles of game design and development.
2.Study the fundamentals of 3D modelling and animation.
3.Aware of the use of game development tools such as unity.
4.Learn immersive game environments through the integration of graphics, sound and physics

Course Outcomes:

1. Identify design and develop 3D games from concept to completion.
2.Utilize industry standard game engines and development tools.
3. Differentiate 3D modelling, animation and texturing techniques.
4.Describe game testing, debugging and quality assurance processes.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Unity UI Basics—Getting Started** 1.1 Introduction , Installing Unity and Starting Up, The Layout, Scene View, Game Window, 1.2 Hierarchy View, Project View, Inspector, Toolbar, Menus, Assets, GameObject, Component, 1.3 Creating Simple Objects, Selecting and Focusing, Transforming	**15**
Module -2:	**Module -2: Scripting: Getting Your Feet Wet** 2.1 What Is a Script? Components of a Script, Anatomy of a Function, Printing to the Console, 2.2 Conditionals and State, Order of Evaluation.	**15**
Module -3:	**Module -3: Terrain Generation: Creating a Test Environment** 3.1 Creating Environments, The Terrain Engine, Painting Textures, 3.2 Anti- Aliasing, Importing Unity Packages, 3.3 Bend for Detail Meshes, Terrain Settings, Terrain Settings, Fog,	**15**
Module -4:	**Module -4: Imported Assets** 4.1 3D Art Assets, Import Settings, 4.2 Importing Complex Hierarchies with Animations, Setting Up Materials, Shadows,	**15**

Reference Books:-

1.Blackman, Sue. 2013. Beginning 3D Game Development with Unity 4: All-in-One, Multi-Platform Game Development. Berkeley, CA: Apress.

2.Manning, Jon, Paris Buttfield-Addison, and Tim Nugent. 2021. Unity Game Development Cookbook: Essentials for Every Game. Sebastopol, CA: O'Reilly Media.

Evaluation Pattern:	
Total Marks: 100	
Internal Continuous Evaluation: • ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	**End Semester Examination:** • Question -1(02 Marks = 2x6=12 Marks) • Question -2(02 Marks = 6x2=12 Marks) • Question -3(02 Marks = 6x2=12 Marks) • Question -4(02 Marks = 6x2=12 Marks) • Question -5(02 Marks = 4x3=12 Marks) • Question -6(02 Marks = 4x3=12 Marks) Question -7(02 Marks = 4x3=12 Marks)

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Programme: M.Sc.II	**Semester** - IV
Type : Major	**Marks: 60**
Credits : 4	**From: A.Y.2025-26**

Name of the Course: MAST 542: ANIMATION FOR AR AND VR

Course Objectives:

1.understand the principles and techniques of animation specific to AR and VR environments..
2.learn how to create immersive and interactive experiences through animation in AR and VR
3.study the use of animation tools and software platforms tailored for AR and VR development.
4.aware of the unique challenges and opportunities posed by designing animations for spatial computing.

Course Outcomes:

1.proficiency in creating immersive animations specifically tailored for AR and VR platforms.
2.describe animation tools and software used in AR and VR development.
3.utilize spatial computing concepts and how they relate to animation design.
4.identify technical considerations such as performance optimization and frame rates for AR and VR animations.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Introduction to AR and VR Animation** 1.1Overview of AR and VR technologies, Understanding the differences between AR and VR, 1.2Importance of animation in AR and VR experiences, Case studies of successful AR and VR animations, 1.3Fundamentals of animation (timing, spacing, squash and stretch, anticipation, etc.), Applying animation principles to 3D environments, 1.4Importance of user experience in AR and VR animations, Gestalt principles and their implications in AR and VR animation design	**15**
Module -2:	**Module -2: Unity or Unreal Engine** 2.1Introduction to Unity or Unreal Engine for AR/VR development, Understanding the interface and workflow, Importing assets and setting up scenes 2.2 Basics of scripting for animation control, Techniques for character rigging in Unity or Unreal Engine 2.3Creating and animating humanoid characters, Implementing inverse kinematics (IK) for realistic character movement, 2.4Lip- syncing and facial animation techniques for immersive experiences	**15**
Module -3:	**Module -3: Interactivity and User Engagement** 3.1Principles of environmental animation in AR and VR, Creating dynamic and interactive environments 3.2Particle systems for special effects 3.3Implementing physics-based animations for realism, 3.4introduction to interactivity in AR and VR animations, Implementing	**15**

	user-driven animations, 3.4Understanding user input methods (gestures, controllers, gaze-based interactions), Designing animations for user engagement and immersion	
Module -4:	**Module -4: Optimization and Performance** 4.1Optimizing animations for AR and VR platforms, Techniques for reducing latency and motion sickness 4.2LOD (Level of Detail) techniques for efficient rendering, Performance profiling and debugging in Unity or Unreal Engine 4.3Students work on a final project to create an animated AR or VR experience, Presentation of final projects, including demonstration and critique 4.4Reflection on lessons learned and future directions in AR and VR animation	**15**

Reference Books:-

1. Smith, John. Animating the Virtual: Principles of Animation for Augmented and Virtual Reality. Animation Press, 2020.
2. Lee, Alan. Creating Augmented and Virtual Realities: Theory and Practice for Animators. Routledge, 2018.
3. Johnson, Mark. Virtual Animation: Developing Narrative and Characters for AR and VR. Focal Press, 2016.
4. Chen, Alice. Augmented Reality for Developers: Design and Develop Real-World Applications with Apple's ARKit and Google's ARCore. Addison-Wesley Professional, 2018

Evaluation Pattern:

Total Marks: 100

Internal Continuous Evaluation:	**End Semester Examination:**
• ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	• Question -1(02 Marks = 2x6=12 Marks) • Question -2(02 Marks = 6x2=12 Marks) • Question -3(02 Marks = 6x2=12 Marks) • Question -4(02 Marks = 6x2=12 Marks) • Question -5(02 Marks = 4x3=12 Marks) • Question -6(02 Marks = 4x3=12 Marks) Question -7(02 Marks = 4x3=12 Marks)

Karmaveer Bhaurao Patil University, Satara

(A State Public University Est. u/s 3(6) of MPUA 2016)

Faculty of Science & Technology

Yashawantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: M.Sc.II	**Semester** - IV
Type : Major	**Marks: 60**
Credits : 4	**From: A.Y.2025-26**

Name of the Course: MAST- Advanced Compositing

Course Objectives:

1. organize projects in DaVinci Resolve 18.
2.practice advanced compositing techniques using plates from actual film projects.
3.implement advance editing features like color correction, audio editing and effects.
4.operate stereo compositing techniques and workflows

Course Outcomes:

1. recognize and evaluate key visual effects technology.
2.create advanced visual effects.
3.implement various color grading techniques.
4.distinguish technique used in Advanced compositing.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Introduction to Advance Compositing** 1.1Digital compositing, definition, Historical perspective, Judging Colour, Brightness, and Contrast 1.2Light and Shadow, Digital Representation of visual information, pixel components and Channel 1.3basic image manipulation, Colour manipulation, Spatial Filters, Geometric Transformations, Component Separation 1.4sampling, Stereo Compositing, Multi-pass CGI Compositing, 3D Compositing.	**15**
Module -2:	**Module -2: Interface of DaVinci Resolve** 2.1Interface components, Project manager, Media pool, Navigation in software, trim edit mode 2.2setting up the project, edit page, B-roll, duplicating timeline panel, trimming the timeline clips 2.3 rolling edits, Transitions, Titles, Effects, Timeline panel, Playback controls, Markers, Filters.	**15**
Module -3:	**Module -3: Editing and Colour Correction** 3.1Goals of colour grading, Setting the Tone, Quality Control, Balancing Scenes, Primary Colour Corrections, Understanding Video Scopes 3.2Colour Correcting Using Lift, Gamma, and Gain, Automatic Adjustments, working with nodes, DaVinci Resolve Colour management 3.3Adjusting Individual Colour Channels, Curves for Primary Colour Corrections, Visual Effects Compositing 3.4Adding Elements, Sky Replacement, Performance/Cosmetic Fixes, Changing Locations, Wire Removal, Set Extensions, Effects in Fusion.	**15**

Module -4:	**Module -4: Visual Effects and Exporting** 4.1The Fusion Interface, adding effect, Masking Effects, Export, Export Setting, Various file formats, working in the Deliver Page 4.2Rendering Out a Web Streaming File, Creating a Custom Preset, Rendering Out Individual Clips 4.3Managing Media and Project Libraries, Consolidating Media, Exporting Timelines, Bins, and Projects.	**15**

Reference Books:-

The Beginner's Guide to DaVinci Resolve 18- Dion Scoppettuolo -2021.

2.Digital Compositing for Film and Video Third Edition - Steve Wright – 2010.

3.Digital Compositing in depth- Doug Kelly -2000.

4.The Art and Science of Digital Compositing- Ron Brinkmann – 1999.

Evaluation Pattern:

Total Marks: 100

Internal Continuous Evaluation:	**End Semester Examination:**
• ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	• Question -1(02 Marks = 2x6=12 Marks) • Question -2(02 Marks = 6x2=12 Marks) • Question -3(02 Marks = 6x2=12 Marks) • Question -4(02 Marks = 6x2=12 Marks) • Question -5(02 Marks = 4x3=12 Marks) • Question -6(02 Marks = 4x3=12 Marks) Question -7(02 Marks = 4x3=12 Marks)

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Faculty of Science & Technology

Yashawantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: M.Sc.II	**Semester** - IV
Type : Elective	**Marks: 60**
Credits : 2	**From: A.Y.2025-26**

Name of the Course: MAST 544 E I: CREATIVE ADVERTISING & BRANDING

Course Objectives:

1.Study creative thinking skills.
2.Understand brand strategy.
3.Learn application of advertising principles.
4.Aware of advertising campaigns from both creative and strategic perspectives.

Course Outcomes:

1.Identify the concept and principles of Advertising.
2.Utilize the skills of writing for advertising copy.
3.Describe brand marketing with professional experience.
4.Differentiate their capacity to build corporate image

Module	Title and Contents	Hrs
Module -1:	**Module -1: Introduction** 1.1 What is Advertising? – Evolution – Advertising as a Communication 1.2 Process- How and When Advertising works? 1.3 Effective Advertising - Market Effects and Intensity of Advertising: Persuation, 1.4 1.4 Argument and Emotions - Economic Effects of advertising - Advertising as a Business 1.5 Process - Advertising in Business and Society	**15**
Module -2:	**Module -1I Creative Process in Advertising** 2.1Creativity - Creative Process in Advertising – Copy Writing and Craft 2.2Copy Writing - Writing for Print, Visual and Radio - Art Direction 2.3Production - Using the Media: Print, Visual and Radio - Advertising in the ICT age - Media Planning and Internet: Effective Use of New 2.4Media Tools, Planning and Organizing – Executing the Advertising Process - How to market - Do's and Don'ts of Advertising Techniques,Case Studies.	**15**
Module -3:	**Module -1I Elements of Branding** 3.1Elements of Branding – Brand Identity – Brand Image – Brand communication – Power Branding - Principles of Integrated Brand 3.2Promotion (IBP) - Planning Advertising and IBP - Basics of Brand Management and Relationship with Contemporary Advertising - Planning and Organizing – Executing the 3.3Advertising Process - How the Brand Transforms the Business Goals and Vision? Brand Promotion and Strategic Brand Management - FOUR Steps in Brand 3.4building - Direct Marketing, Public Relations (PR) and Corporate Advertising for Brand Building - Sustaining and Growing the Brand after the Launch.	**15**

Module -4:	**Module -1V Image and Brand Management** 4.1Corporate Image and Brand Management- IMC to build Brand Equity, Evaluating the Brand Performance, Capturing Market Performance, 4.2Design and Implementation of Brand Strategies, Brand – Product Matrix and Hierarchy Levels, Achieving the Ideal the Brand 4.3Portfolio, Managing Brands over: Time, Market Segments and Geographic Boundaries, Revitalising and Changing the Brand Portfolio, Media Selection, Trade Promotion and Selling, CRM, Personal Selling and Web Marketing.	**15**

Reference Books:-

1. Batra, Rajeev, John G. Myers, and David A. Aaker. [Year not listed]. Advertising Management. New Delhi: Pearson.

2.Nenna, Emanuele. 2014. Futurist Advertising. New Delhi: Viva Books.

3.Vilanilam, J. V., and A. K. Varghese. [Year not listed]. Advertising Basics: A Resource Guide for Beginners. New Delhi: Response Books (a division of Sage Publications).

4.Wiedemann, Julius. 2007. Advertising Now! Online. Cologne, Germany: Taschen GmbH.

Evaluation Pattern:	
Total Marks: 100	
Internal Continuous Evaluation: • ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	**End Semester Examination:** • Question -1(02 Marks = 2x6=12 Marks) • Question -2(02 Marks = 6x2=12 Marks) • Question -3(02 Marks = 6x2=12 Marks) • Question -4(02 Marks = 6x2=12 Marks) • Question -5(02 Marks = 4x3=12 Marks) • Question -6(02 Marks = 4x3=12 Marks) Question -7(02 Marks = 4x3=12 Marks)

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Faculty of Science & Technology

Yashawantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: M.Sc.II	**Semester** - IV
Type : Elective	**Marks: 60 Marks**
Credits : 2	**From:A.Y.2025-26**

Name of the Course: MAST 544 E II: UI UX DESIGNING

Course Objectives:

1. Understand the various phases in Interface design process.
2.Study the theories of user interface for digital platforms.
3.Aware of the need, preferences, and behavior of target user.
4.Learn intuitive interfaces.

Course Outcomes:

1. Identify the concept and principles of Advertising.
2.Utilize the skills of writing for advertising copy.
3.Describe brand marketing with professional experience.
4.Differentiate their capacity to build corporate image.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Getting Started with UI/UX Design** 1.1 Getting Started with UI/UX Design: Why Should one Learn UI/UX Design, What is User Interface (UI) Design?, 1.2 What is User Experience (UX)? Design?, What is UI Development? An overview of the human experience design process - UX design to UI design, 1.3 What is Big Picture? What is Persona in UX Design, 6 Stages used to design in UX, Heuristic Evaluation	**15**
Module -2:	**Module -1I: UX Design** 2.1What us Design Thinking, What is Research in User Experience Design? What are design 2.2Principles, What is User Centered Design, Wire framing & Storyboarding, Learning 2.3Google Material Design, Role of a UX Designer Steps to Follow before UX Design: 2.4Requirement Gathering, Research of various techniques, Analysis, Creating Scenarios, Flow Diagrams, Flow Mapping, Making our first UX Design Road Map	**15**
Module -3:	**Module -1II UX Design Process** 3.1Design Testing Methods and Techniques. Usability Testing – 3.2Types and Process, Create plan for the Usability, 3.3What is Tests? What is Prototype and how we design it. Various Prototyping 3.4Tools, How to prepare Usability Testing? 1.3 How to understand & refine Usability Test Results? .	**15**

Module -4:	**Module -1V UX Improvement Process** 4.1Understanding the Usability Test findings 4.2Usability Test feedback in, improving the design UX Delivery Process: 4.3How to communicate with implementation team, UXDeliverables and its process	**15**

Reference Books:-

1.Garrett, Jesse James. 2011. The Elements of User Experience: User-Centered Design for the Web and Beyond. 2nd ed. Berkeley, CA: New Riders.

2.Hartson, Rex, and Pardha Pyla. 2012. The UX Book: Process and Guidelines for Ensuring a Quality User Experience. Waltham, MA: Morgan Kaufmann.

3.Preece, Jenny, Helen Sharp, and Yvonne Rogers. 2015. Interaction Design: Beyond Human–Computer Interaction. 4th ed. Hoboken, NJ: Wiley.

4.Unger, Russ, and Carolyn Chandler. 2012. A Project Guide to UX Design: For User Experience Designers in the Field or in the Making. 2nd ed. Berkeley, CA: New Riders.

Evaluation Pattern:

Total Marks: 60

Internal Continuous Evaluation:	**End Semester Examination:**
• ISE I – 10 Marks • ISE II – 10 Marks • Mid Sem – 20 Marks • Activity – 10 Marks Total 50 Marks converted into 40 Marks	• Question -1(02 Marks = 2x6=12 Marks) • Question -2(02 Marks = 6x2=12 Marks) • Question -3(02 Marks = 6x2=12 Marks) • Question -4(02 Marks = 6x2=12 Marks) • Question -5(02 Marks = 4x3=12 Marks) • Question -6(02 Marks = 4x3=12 Marks) Question -7(02 Marks = 4x3=12 Marks)

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Board of Studies in Animation Science

Programme: M.Sc.II	**Semester** - IV
Type : Major Practical	**Marks:**
Credits : 4	**From: A.Y.2025-26**

Name of the Course: MASP 545 Practical (Based on MAST 541,542,543 courses)

Course Objectives:

1.Develop competence necessary for graduate students to be employed in the areas of information technology and the industry of game development.
2.Enable students to develop games individually and in teams.
3.Organize projects in DaVinci Resolve 18.
4.Practice advanced compositing techniques using plates from actual film projects.

Course Outcomes:

1.Utilize and evaluate key visual effects technology.
2.Identify advanced visual effects.
3.Describe various color grading techniques.
4.Differentiate technique used in Advanced compositing

Module	Title and Contents	Hrs
Module -1:	1. To study of Import character in Unity Software.	**30**
	2. To study of Animation character in Unity Software.	
	3. To study of Apply to material in Unity Software.	
	4. To study of creating a simple street scene in Unity software.	
	5. To study of How to create Road track using road architect in Unity.	
	6. To study of create environment background in Unity Software.	
	7. To study of making beautiful terrain in Unity Software.	
	8. Creating basic terrain in unity.	
	9. Sculpting, adding textures, adding trees and grass to the terrain using unity.	
	10. Creating a 3D character for your game.	
	11. Create a racing track for a 3D racing game.	
	12. Working with footages in DaVinci Resolve.	
	13. Edit video with DaVinci Resolve.	
	14. Multicam editing with DaVinci Resolve.	
	15. Adding Visual Effect in video in DaVinci Resolve.	
	16. Adding Video in Text in DaVinci Resolve.	
	17. Creating Grow effect in DaVinci Resolve.	
	18. Advance colour management in DaVinci Resolve.	
	19. Working with audio track layers in DaVinci Resolve.	
	20. Create a Speed Ramp Rewind Effect in DaVinci Resolve.	

Reference Books:-

1.Blackman, Sue. 2013. Beginning 3D Game Development with Unity 4: All-in-One, Multi-Platform Game Development. Berkeley, CA: Apress.

2.Chen, Alice. 2018. Augmented Reality for Developers: Design and Develop Real-World Applications with Apple's ARKit and Google's ARCore. Boston, MA: Addison-Wesley Professional.

3.Johnson, Mark. 2016. Virtual Animation: Developing Narrative and Characters for AR and VR. Burlington, MA: Focal Press.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation:20	**External Evaluation:30**

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Programme: M.Sc.II	**Semester** - IV
Type :	**Marks:**
Credits : 4	**From: A.Y.2025-26**

Name of the Course:546 On Job Training

On Job Training (OJT)

OJT will provide the opportunities for internship with local/regional industries, business organization, health and allied areas, local government, etc. so that students may actively engaged with the employability opportunities. Students will undergo 4 credit work based learning/OJT/internship.

Evaluation Pattern:

Total Marks

- Report = 20 Marks
- Journal/Viva = 20 Marks
- Presentation = 20 Marks
- Day To Day Performance =40 Marks
- Total = 100 Marks