Karmaveer Bhaurao Patil University, Satara

Syllabus for

B. Sc. III (Animation Science)

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2025-2026

Syllabus for Bachelor of Science (B. Sc.) Part – III Animation Science

PREAMBLE:

The B.Sc. Animation course under the autonomy framework will be introduced in the academic year 2025-2026. It has been designed to meet the specific needs of B.Sc. Animation students in accordance with the NEP 2020 guidelines. The curriculum has been developed to reflect the expanding scope of Animation and Computational sciences. The focus is on equipping students with up-to-date knowledge while maintaining a strong foundation in classical Animation. This approach will enable students to understand and appreciate contemporary interdisciplinary methods in Animation science and their contributions to various industry and societal development. The course also includes new practical exercises, providing students with hands-on experience with the latest techniques currently in use. Additionally, the course is intended to inspire students to pursue higher studies in Animation, become entrepreneurs, and seek employment in IT and Animation industries.

GENERAL OBJECTIVES OF THE COURSE:

1. To provide students with a solid foundation in the scientific and technical principles underlying animation.
2. To foster a scientific and creative mindset, encouraging students to be open-minded, analytical, and innovative in their approach to animation.
3. To develop practical skills in using animation tools, conducting simulations, and applying animation techniques in scientific and educational contexts.
4. To help students understand key concepts, terminology, and phenomena related to animation science and their interdisciplinary applications.
5. To raise students' awareness of the role of animation in communicating scientific, environmental, and social issues.
6. To equip students with in-depth knowledge of animation and related technologies, enabling them to create content that benefits science, education, and society.
7. To empower students to apply their animation knowledge to fields such as education, healthcare, entertainment, and research, promoting innovation and self-reliance.

PROGRAMME OUTCOMES

After completing the B.Sc. program, graduates will:

1. Possess a strong foundation of knowledge in their chosen field of study.
2. Develop a scientific mindset, becoming open-minded, critical, and curious, which will support their entry into research and innovation.
3. Be skilled in practical work, experiments, and the use of laboratory materials.

4. Be eligible to pursue higher studies in their field, both in India and abroad.
5. Qualify to appear for examinations for jobs in government organizations.
6. Meet the minimum eligibility requirements for various science-related job opportunities.
7. Be prepared to establish their own entrepreneurial ventures.
8. Enhance critical thinking, develop a scientific attitude, solve problems, improve practical skills, boost communication abilities, and strengthen social interactions.

PROGRAMME SPECIFIC OUTCOMES

After completing the B.Sc. (Animation) program, students will:

1. **Comprehensive Knowledge**: Develop a deep understanding of animation principles, visual storytelling, and the scientific concepts that support animation techniques.
2. **Technical Proficiency**: Gain hands-on experience with industry-standard software and technologies used in 2D/3D animation, motion capture, visual effects (VFX), and simulation.
3. **Scientific Application**: Apply scientific knowledge—such as physics, biology, and human anatomy—to create realistic and educational animations.
4. **Creative Problem Solving**: Cultivate the ability to design innovative solutions using animation for complex problems in science, education, and communication.
5. **Research Skills**: Acquire research capabilities to explore emerging trends, technologies, and scientific developments in the field of animation.
6. **Interdisciplinary Approach**: Integrate knowledge from diverse domains such as computer science, psychology, media studies, and natural sciences to enrich animation projects.
7. **Communication and Presentation**: Enhance communication skills through the visual representation of scientific ideas, suitable for academic, industrial, or public audiences.
8. **Professional Ethics and Responsibility**: Understand the ethical implications of animation content and promote responsible use in education, media, and research.
9. **Teamwork and Collaboration**: Work effectively in multidisciplinary teams to plan, produce, and evaluate animation projects.
10. **Lifelong Learning**: Encourage continuous learning and adaptability in response to evolving animation technologies and scientific challenges.

1. TITLE: **Animation Science**

2. YEAR OF IMPLEMENTATION: **2025-2026**

3. DURATION: **01 year**

4. PATTERN: **Semester examination**

5. MEDIUM OF INSTRUCTION: **English**

6. STRUCTURE OF COURSE:

As per NEP-2020 (1.0)

<table>
<tr><th rowspan="3">Level</th><th rowspan="3">Sem.</th><th colspan="4">Subject</th><th rowspan="3">VSC</th><th rowspan="3">FP</th><th rowspan="3">CEP</th><th rowspan="3">OJT</th><th rowspan="3">Total</th></tr>
<tr><th colspan="2">DSC</th><th colspan="2">DSE*</th></tr>
<tr><th>T</th><th>P</th><th>T</th><th>P</th></tr>
<tr><td rowspan="2">5.5</td><td rowspan="2">V</td><td>DSC I (2)</td><td rowspan="2">DSC P (4)</td><td>DSE I (2)</td><td rowspan="2">DSE P (2)</td><td rowspan="2">VSC (4)</td><td rowspan="2">FP (2)</td><td rowspan="2">CEP (2)</td><td rowspan="2">--</td><td rowspan="2">22</td></tr>
<tr><td>DSC II (2)</td><td>DSE II (2)</td></tr>
<tr><td rowspan="2">5.5</td><td rowspan="2">VI</td><td>DSC I (2)</td><td rowspan="2">DSC P (4)</td><td>DSE I (2)</td><td rowspan="2">DSE P (2)</td><td rowspan="2">VSC (2)</td><td rowspan="2">FP (2)</td><td rowspan="2">--</td><td rowspan="2">OJT (4)</td><td rowspan="2">22</td></tr>
<tr><td>DSC II (2)</td><td>DSE II (2)</td></tr>
</table>

* DSE - 2 Papers out of four for each semester

7. COURSE TITLE

1) Fifth Semester

- **Semester V Level 5.5**

Course	Course Category	Course Code	Course Title	Credits
DSC	T	BAST 351	Vector Base Animation	02
	T	BAST 352	2D Game Design	02
	P	BASP 357	Vector Base Animation (Lab)	02
	P	BASP 358	2D Game Design (Lab)	02
DSE (2 Theory Papers Out of Four)	T	BAST 353	VFX	02
	T	BAST 354	Market Research	02
	T	BAST 355	Maya Modelling and Texturing	02
	T	BAST 356	Artificial Intelligence	02
	P	BASP 359	Elective course Lab	02
VSC	P	BASPVSC III	Maya Modelling	02
	P	BASPVSC IV	Maya Inorganic Modelling	02
FP	P	BASPFP I	Field Project	02
CEP	P	BASPCEP I	Community Engagement Programme	02

DSC: Discipline Specific Course; **DSE**: Discipline Specific Elective **VSC**: Vocational Skill Course; **OJT** : On Job Training, **FP**: Field Project, **CEP**: Community Engagement Program, **T**: Theory, **P**: Practical

2) Sixth Semester

- **Semester VI Level 5.5**

Course	Course Category	Course Code	Course Title	Credits
DSC	T	BAST 361	Maya Rigging & Animation	02
	T	BAST 362	Rotoscoping	02
	P	BASP 367	Maya Rigging & Animation (Lab)	02
	P	BASP 368	Rotoscoping (Lab)	02
DSE (2 Theory Papers Out of Four)	T	BAST 363	AR For Animation	02
	T	BAST 364	VR For Animation	02
	T	BAST 365	3D Printing in Animation	02
	T	BAST 366	UI/UX	02
	P	BASP 369	Elective course Lab	02
VSC	P	BASPVSC V	3D Dynamics & Rendering	02
FP	P	BASPFP II	Field Project	02
CEP	P	BASPOJT I	On Job Training	04

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8. EVALUATION STRUCTURE:

- **B.Sc. III NEP 1.0**
- **Semester V Level 5.5**

Course	Course Category	Course Code	Internal Evaluation			ESE	Total Marks	Credits
			CCE-I	Mid - Semester	CCE-II			
DSC	T	BAST 351	05	10	05	30	50	02
	T	BAST 352	05	10	05	30	50	02
	P	BASP 357	--	--	--	50	50	02
	P	BASP 358	--	--	--	50	50	02
DSE (2 Theory Papers Out of Four)	T	BAST 353	05	10	05	30	50	02
	T	BAST 354	05	10	05	30	50	02
	T	BAST 355	05	10	05	30	50	02
	T	BAST 356	05	10	05	30	50	02
	P	BASP 359	--	--	--	50	50	02
VSC	P	BASPVSCIII	--	--	--	50	50	02
	P	BASPVSCIV	--	--	--	50	50	02
FP	P	BASPFP I	--	--	--	50	50	02
CEP	P	BASPCEP I	--	--	--	50	50	02
Total							**550**	**22**

DSC: Discipline Specific Course; **DSE**: Discipline Specific Elective **VSC**: Vocational Skill Course; **OJT** : On Job Training, **FP**: Field Project, **CEP**: Community Engagement Program, **T**: Theory, **P**: Practical

- **B.Sc. III NEP 1.0**
- **Semester VI Level 5.5**

Course	Course Category	Course Code	Internal Evaluation			ESE	Total Marks	Credits
			CCE-I	Mid - Semester	CCE-II			
DSC	T	BAST 361	05	10	05	30	50	02
	T	BAST 362	05	10	05	30	50	02
	P	BASP 367	--	--	--	50	50	02
	P	BASP 368	--	--	--	50	50	02
DSE (2 Theory Papers Out of Four)	T	BAST 363	05	10	05	30	50	02
	T	BAST 364	05	10	05	30	50	02
	T	BAST 365	05	10	05	30	50	02
	T	BAST 366	05	10	05	30	50	02
	P	BASP 369	--	--	--	50	50	02
	P	BASP 366-E2	--	--	--	50	50	02
VSC	P	BASPVSC V	--	--	--	50	50	02
FP	P	BASPFP II	--	--	--	50	50	02
OJT	P	BASPOJT I	--	--	--	100	100	04
Total							**550**	**22**

DSC: Discipline Specific Course; **DSE**: Discipline Specific Elective **VSC**: Vocational Skill Course; **OJT**: On Job Training; **FP**: Field Project; **CEP**: Community Engagement Program, **T**: Theory; **P**: Practical

9. OTHER FEATURES:

A) LIBRARY:

Reference books, Textbooks and journals are available in Institute and Departmental Library. (Separate reference lists are attached along with the respective course syllabus)

B) EQUIPMENT:

a) Computer, LCD projector, visualizer, smart board

1. Graphics Workstations – High-performance computers equipped with advanced GPUs for 2D/3D animation, rendering, and simulation tasks.
2. Digital Drawing Tablets – Essential for hand-drawn animation, concept art, and texture creation.
3. AR Equipment – Headsets and controllers for developing immersive animated environments and simulations.
4. Render Farm Access – A network of computers dedicated to rendering complex animation scenes efficiently.
5. Animation Software Suite – Includes tools like Autodesk Maya, Blender, Adobe After Effects, Houdini, and Unity/Unreal Engine.
6. High-Resolution Monitors & Colour Calibration Tools – For precision in visual output during animation production and post-processing.

Karmaveer Bhaurao Patil University, Satara

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

Faculty of Science

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 351 : Vector Based Animation

Course Objectives:

1) learn different animation techniques based on style, requirements, and advantages.
2) study of animation principles for 2D animation.
3) understand the fundamentals of vector Animation.
4) to design and produce professional-quality vector-based animations using industry-standard tools.

Course Outcomes:

1) animate Using Key frames and Tweening
2) understand the Fundamentals of 2D Animation.
3) develop Character Rigs for Animation.
4) synchronize Animation with Audio.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Introduction to Vector-Based Animation** **1.1** Vector Animation, Difference between raster and vector graphic, Advantages of vector-based animation: scalability, file size, and precision, Basic principles of vector art and drawing tools, Understanding the workspace (Timeline, Stage, Tools, Properties) **1.2** Introduction to panels and layers. Document settings and configurations Creating and Managing Documents **1.3** Setting up stage dimensions, Creating different file types (HTML5 Canvas, Flash, Web GL, etc.)	**08**
Module -2:	**Module -2: Drawing and Designing in Animate CC** **2.1** The Drawing Tools-Selection tool, Pen tool, Brush tool, and Pencil tool Using the Shape tool (rectangle, oval, line) **2.2** Modifying vector paths and anchor points Working with Colours and Gradients, using fill, stroke, and transparency, Creating and applying gradients, Swatches and colour themes **2.3** Symbols and Libraries Creating and using symbols (Graphic, Button, Movie Clip), **2.4** Organizing assets using the Library, Symbol instances and properties	**07**

Module -3:	**Module -3: Animation Fundamentals** **3.1** Principles of Animation-The 12 principles of animation: Squash and stretch, anticipation, staging, etc., Timing and spacing in animation. **3.2** Understanding frame rate and its impact on animation, Using onion skinning for frame analysis, Basic Animation Techniques Frame-by-frame animation. **3.3** Motion Twining and Shape Twining, Classic Twining and the difference between tweens, easing (Ease In/Out) to make animations feel natural. **3.4** Creating smooth and realistic motion, Timeline Basics, Key frames, frames, and layers	**08**
Module -4:	**Module -4 : Advanced Animation Techniques** **4.1** Motion Tweens and Advanced Features, Motion paths, easing, and customization. **4.2** Transforming objects along motion paths, Rotating and scaling objects, Shape Tweens, Animating vector shapes smoothly ,Morphing one shape **4.3** Using Masks and Blending Modes, **4.4** Masking techniques for hiding or revealing parts of objects Layer effects using blending modes	**07**

Reference Books:-

1. Bakich, Myke. 2017. *How to Cheat in Adobe Animate CC: Get Professional Results Without Breaking the Bank*. Burlington, MA: Focal Press.
2. Glitschka, Von. 2011. *Vector Basic Training: A Systematic Creative Process for Building Precision Vector Artwork*. Berkeley, CA: New Riders.
3. Labrecque, Joseph. 2017. *Animating with Adobe Animate CC: Walkthroughs, Workflows, and Projects*. Burlington, MA: Focal Press.
4. Labrecque, Joseph. 2016. *Learn Adobe Animate CC for Multiplatform Animations*. Berkeley, CA: Apress.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	**End Semester Examination:** • Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M)

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Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 352 : 2D Game Design

Course Objectives :

1) learn how to add background music, sound effects, and 2D particle systems.
2) understand Unity's 2D Game Development Environment.
3) design interactive menus, buttons, and HUD elements.
4) understand Rigid body 2D and Collider 2D components.

Course Outcomes:

1) Recall and identify Unity's 2D tools and components.
2) Describe the process of importing, organizing, and managing 2D assets in Unity.
3) Demonstrate the ability to create a basic 2D game level using Unity's tilemap system and 2D sprite tools.
4) Analyze the relationship between different Unity components.
5) Design and develop a complete 2D game.

Module	Title and Contents	Hrs
Module -1:	**Module -1 : 2D in Unity** **1.1** Introduction to 2D games, 2D graphics, 2D physics, game development, project setting for 2D games **1.2** 2D game creation workflow, Unity Editor interface, toolbar, manipulating objects, **1.3** Unity projects, Assets and scene, fundamentals, scripting, sprites **1.4** building in-game environment, character animation, graphics, audio.	**08**
Module -2:	**Module -2: Fundamentals of games** **2.1** Scenes, painting levels, level testing, GameObjects, Prefabs, sprite Renderer, cameras, **2.2** Collider 2D, Importing and setting up Sprites, Sprite Atlas, 9-slicing, Tilemap, 2D Tilemap Extras, Isometric Tilemaps **2.3** SpriteShape Character animation, Frame-by-frame, Cutout, Skeletal, Graphics, Lighting, Shadows, Particle systems,Post-processing.**2.4** Organizing assets using the Library, Symbol instances and properties	**07**

Module -3:	**Module -3: Sprites and Tilemaps** **3.1** Rigidbody 2D, Collider 2D, Triggers, 2D Joints, 2D Effectors, Audio. **3.2** 2D game perspectives, reference, 2D game art style reference, Image. **3.3** import as sprites, Sprites sorting order, Sprite renderer, Placeholder sprites, sprite editor, custom outline, custom physics shapes. **3.4** Tilemaps in unity, working with tilemaps, hexagonal tilemaps, isometric tilemaps.	**08**
Module -4:	**Module -4 : Publishing** **4.1** 2D renderer sorting, Overview, Transparent Queue Sorting Order by Priority. **4.2** Sorting Layer and Order in Layer, Specify Render Queue, Distance to Camera. **4.3** rendering pipeline, post-processing and full-screen effects, color, Graphics performance and profiling. **4.4** Platform development, Cross-platform features and considerations.	**07**

Reference Books:-

1. Lanzinger, Franz. 2020. *2D Game Development with Unity*. Boca Raton, FL: CRC Press. https://www.taylorfrancis.com/books/mono/10.1201/9780429328664/2d-game-development-unity-franz-lanzinger.
2. Godbold, Ashley, and Simon Jackson. 2016. *Mastering Unity 2D Game Development*. Birmingham, UK: Packt Publishing. https://www.amazon.in/Mastering-Unity-2D-Game-Development/dp/1786463458.
3. Halpern, Jared. 2018. *Developing 2D Games with Unity: Independent Game Programming with C#.* Berkeley, CA: Apress. https://www.oreilly.com/library/view/developing-2d-games/9781484237724/.
4. McShaffry, Mike, and David Graham. 2013. *Game Coding Complete*. 4th ed. Boston, MA: Course Technology PTR.

Evaluation Pattern:

Total Marks: 100 / 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

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Faculty of Science & Technology

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Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 357 : Vector Based Animation

Course Objectives :

1) study different animation techniques based on style, requirements, and advantages.
2) study animation principles for 2D animation.
3) learn tweens and articulated motions with inverse kinematics.
4) understand professional flash multimedia movies and web-friendly Movies.

Course Outcomes:

1) understand the layout, panels, and timeline in Animate CC.
2) learn to create movie clip, button, and graphic symbols for animation reuse.
3) demonstrate shape transitions using shape tweening.
4) manage multiple animation layers and organize timeline efficiently.

Lab Course	Title and Contents	Hrs
BASP 357	1.Character and Backgrounds Tracing.	60
	2.Object Rigging and Animation.	
	3.Eye Blinking and Masking.	
	4.Create Bird Animation using wave Principle.	
	5.Create Galaxy Effect Animation In Animate CC.	
	6.Create Flag Animation Using Wave Principle.	
	7.Create Stick Figure Animation.	
	8.Create Lips Synchronization in Animate CC.	
	9.Create Face Rigging.	
	10.Create Parallax Effect Animation.	
	11.Create Human face rigging	
	12.Create Water Splash Animation.	
	13.Create Semi-Realistic character rigging.	

	14.Create Semi-Realistic Animal rigging.	
	15.Create Semi- character Walk Cycle.	

Reference Books:-

1) Williams, Richard. The Animator's Survival Kit: A Manual of Methods, Principles and Formulas for Classical, Computer, Games, Stop Motion and Internet Animators. London: Faber and Faber, 2001.
2) Dmitriev, Konstantin. Synfig Studio – Beginner's Guide. Packt Publishing, 2012.
3) Bakich, Myke. *How to Cheat in Adobe Animate CC: Get Professional Results Without Breaking the Bank*. Burlington, MA: Focal Press, 2017.
4) abrecque, Joseph. Learn Adobe Animate CC for Multiplatform Animations. Berkeley, CA: Apress, 2016.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

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Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 358: 2D Game Design

Course Objectives :

1) implement basic player movement using Unity's physics components.
2) create simple player-to-object interactions using triggers and collisions.
3) add simple UI buttons and learn how to trigger events.
4) design and implement a collectible system.

Course Outcomes:

1) understand the relationships between game objects, physics components, and user input in the development of interactive 2D games.
2) implement gameplay mechanics such as jumping, collecting items, detecting collisions, and applying scoring systems.
3) assess the usability of the game's user interface.
4) design and develop a functional and polished 2D game prototype.

Lab Course	Title and Contents	Hrs
BASP 358	1.Working with background in for 2D game Unity.	**60**
	2. Creating character movement in unity for 2D game.	
	3.Character animation in unity for 2D game.	
	4.Creating simple 2D secene in unity.	
	5.Import and Use Sprites in unity	
	6.Add Jumping Mechanic in Unity	
	7.Adding platforms and detect collisions using colliders in Unity.	
	8.Create Collectibles System in Unity for 2D games.	
	9.Create Score System in Unity for 2D games.	
	10.Create a Simple Enemy in Unity.	
	11.Create a Health System in Unity.	
	12.Design a simple level layout with tiles and obstacles.	
	13.Animate the enemy with walking and attack states.	
	14.Create a main menu with buttons to start and quit the game. (UI Main Menu)	

	15.Attach a camera script that smoothly follows the player.	

Reference Books:-

1) Hocking, Joe. 2022. *Unity in Action*. 3rd ed. Shelter Island, NY: Manning Publications.

2) Borromeo, Nicolas Alejandro. 2022. *Hands-On Unity 2022 Game Development*. Birmingham, UK: Packt Publishing.

3) Cameron, Scott H., and Edward Falzon. 2024. *Unity 2022 by Example*. Birmingham, UK: Packt Publishing.

4) Smith, Matt, and Shaun Ferns. 2021. *Unity Game Development Cookbook*. Sebastopol, CA: O'Reilly Media.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

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Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 353 : VFX

Course Objectives :

1) understand the composition, timeline, and layers structure.

2) apply principles of motion such as easing, anticipation, and follow-through.

3) design and animate custom text and shapes

4) composite multiple layers for visual effects.

Course Outcomes:

1) understand Adobe After Effects and video creations.

2) understand roto brush and its attribute.

3) create dynamic animations using keyframes.

4) produce a complete animated project.

Module	Title and Contents	Hrs
Module -1:	**Module -1 : Interface** **1.1** Workspaces, panels, viewers, Projects and compositions, Composition settings, **1.2** Composition basics, Precomposing, nesting, and pre-rendering, Timecode and time display units Projects, importing footage, Supported import formats, Frame rate, **1.3** importing 3D image files, Previewing, working with footage items, Views, and previews, **1.4** Fast Previews, Region of interest , Resolution, Cameras, lights, points of interest	**08**
Module -2:	**Module -2: Layers and Effects** **2.1** Creating layers, Adjustment layers, Working with layers, Layer properties, Types of layers, **2.2** Blending modes and layer styles, 3D layers , Cameras, lights, and points of interest, Animation and key frames, **2.3** Graph Editor, Apply immersive video effects, Construct VR environments in After Effects, **2.4** Setting, selecting, and deleting key frames, Keyframe interpolation, Speed.	**07**

Module -3:	**Module -3: Working with Texts** **3.1** Creating and editing text layers, types of text, Formatting characters and the Character panel. **3.2** Animating text, Text animation presets, Text anchor point properties, Extruding text, and shape layers. **3.3** Tracking 3D camera movement, Animating with Puppet tools, Color basics. **3.4** Drawing, painting, and paths, Managing and animating shape paths and masks, Mask Reference.	**08**
Module -4:	**Module -4 : Rendering** **4.1** Basics of rendering and exporting, Render and export with the Render Queue panel. **4.2** Render and export with Adobe Media Encoder, supported output formats, Render settings. **4.3** Encoding and compression options for movies, Rendering and exporting still images and still-image sequences Transparency and compositing. **4.4** Keying, Roto Brush, Refine Edge, Refine Matte effects, Markers, Basics of rendering and exporting..	**07**

Reference Books:-

1. Fridsma, Jerron. 2023. *Adobe After Effects Classroom in a Book (2023 Release)*. San Francisco: Adobe Press.
2. Meyer, Trish, and Chris Meyer. 2016. *After Effects Apprentice: Real-World Skills for the Aspiring Motion Graphics Artist*. 4th ed. New York: Routledge.
3. Christiansen, Mark. 2013. *Adobe After Effects Studio Techniques*. San Francisco: Adobe Press.
4. Gyncild, Brie. 2019. *Adobe After Effects CC Classroom in a Book (2019 Release)*. San Francisco: Adobe Press.

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

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Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 354 : Market Research

Course Objectives :

1) understand fundamental principles, concepts, and measurement tools for Market Research planning.
2) understand market research logic and systematic manner.
3) recognized difference between qualitative and quantitative research methods.
4) collect and Analyze Market Data.

Course Outcomes:

1) define the basic concepts related to marketing research.
2) explain the concepts about contemporary marketing research.
3) create concrete plan of market research for a particular business.
4) explain relationship and differences between marketing research and marketing information systems.

Module	Title and Contents	Hrs
Module -1:	**Module -1 : Marketing Research-Basic understanding** **1.1** Meaning of Marker Research & Marketing Research, **1.2** Role of Marketing Research in Marketing Management, **1.3** process of Marketing Research, **1.4** Ethical Issues in Marketing Research, Nature & contents of Ethical Issues	**08**
Module -2:	**Module -2: Branches of Marketing Research** **2.1** Consumer Research - Meaning & Scope, Need, Functions. Product Research - Meaning & Scope, Importance. **2.2** Advertising Research - What to Test, When to Test. Media Research - Functions of Media Research. **2.3** Motivational Research - Meaning uses & Limitations. Techniques **2.4** Marketing Research in India	**07**
Module -3:	**Module -3: Marketing Research Proposal & Design & Scales of Measurement** **3.1** Marketing Research Proposal – Meaning, Elements of Research Proposal. **3.2** Marketing Research Design – Its Meaning, Its Importance, Types of Research Design, Criteria of good Research Design.	**08**

	3.3 Scales of Measurement – Meaning of Measurement in Marketing Research, **3.4** Criteria of sound Measurement of Marketing Research	
Module -4:	**Module -4 : Sampling in Marketing Research & Marketing Research Report** **4.1** Meaning of sampling, steps of sampling process, **4.2** Types of sampling plans, Meaning of Marketing Research Report, **4.3** writing criteria of Marketing Research Report, Proforma / Format of a Market Research Report, **4.4** Types of Research Report	**07**

Reference Books:-

. Chunawala, S. A. *Essentials of Marketing Research*. Mumbai: Himalaya Publishing House.
. Goel, B. S. *Marketing Research*. Meerut, UP: Pragati Prakashan.
. Kotler, Philip, Kevin Lane Keller, Abraham Koshy, and Mithileshwar Jha. *Marketing Management*. 13th ed. Noida: Pearson Education India.
. Silver, Lawrence, and Robert E. Stevens. 2012. *The Essentials of Marketing Research*. October 18.

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

Karmaveer Bhaurao Patil University, Satara

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

Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 355 : Maya Modeling and Texturing

Course Objectives :

1) understand the Maya Interface.
2) explore 3D Modeling Fundamentals.
3) understand the Principles of Texturing.
4) demonstrate UV Mapping Skills.

Course Outcomes:

1) identify and describe key components of the Maya interface relevant to modeling and texturing workflows.
2) demonstrate an understanding of 3D modeling concepts such as topology, edge flow, and surface continuity.
3) create basic to intermediate 3D models using polygonal and NURBS modeling techniques in Maya.
4) apply UV unwrapping techniques to prepare 3D models for texturing with minimal distortion.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Introduction** **1.1** Working in Maya-Creating and Editing Maya Nodes, Creating Maya Projects, **1.2** Organizing Complex Node Structures with Assets,- UV Texture Layout, What Are UV Texture Coordinates? **1.3** Mapping the Giraffe Leg **1.4** Unfolding UVs Mapping the Giraffe Head.	**08**
Module -2:	**Module -2: Fundamentals of Polygonal and NURBS Modeling** **2.1** NURBS Modeling in Maya-Understanding NURBS, Employing Image Planes, **2.2** Modeling NURBS Surfaces, Creating Realism, NURBS Tessellation, Arranging UV Shells **2.3** Additional UV Mapping Considerations Transferring UVs Multiple UV Sets Optimizing Textures **2.4** Bump and Normal Mapping	**07**
Module -3:	**3.1** Polygon Modeling Understanding Polygon Geometry, Working with Smooth Polygons, **3.2** Using Smooth Mesh Polygons, Editing Polygon Components, Adding	**08**

	Components, Modeling with Deformers, Combining Meshes, **3.3** Polygon Modeling with Paint Effects Bump Maps Normal Maps Creating Normal Maps **3.4** Applying Normal Maps Displacement Mapping Converting Displacement to Polygons	
Module -4:	**Module -4: Creating and Applying Textures in Maya** **4.1** Convert NURBS Surfaces to Polygons, Boolean Operations, Sculpting Polygons Using Artisan, **4.2** Advanced Polygon Editing Tools, Using Subdivision Surfaces, Sub Displacement Maps for Characters **4.3** Combined Displacement and Bump Maps Subsurface Scattering Fast. **4.4** Simple Skin Shader Setup Subsurface Scattering Layers	**07**

Reference Books:-

1.Birn, Jeremy. 2017. *Digital Lighting and Rendering*. 3rd ed. San Francisco: New Riders

2. Beane, Andy. 2012. *3D Animation Essentials*. Indianapolis: Wiley.

3. Derakhshani, Dariush. 2020. *Autodesk Maya 2020 Basics Guide*. Mission, KS: SDC Publications

4. Lanier, Lee. 2015. *Professional Digital Compositing: Essential Tools and Techniques*. Hoboken: John Wiley & Sons.

Evaluation Pattern:	
Total Marks: 100 / 50	
Internal Continuous Evaluation: • CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	**End Semester Examination:** • Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 356 : Artificial Intelligence.

Course Objectives :

1) understand the concepts of Artificial Intelligence.
2) illustrate the methods of solving problems using Artificial Intelligence.
3) understand the knowledge representation techniques, reasoning techniques and planning.
4) understand the concepts of Expert Systems and machine learning.

Course Outcomes:

1) understand the informed and uninformed problem types and apply search strategies to solve them.
2) design and evaluate intelligent expert models for perception and prediction from intelligent environment.
3) demonstrate and enrich knowledge to select and apply AI tools to synthesize information and develop models within constraints of application area.
4) formulate valid solutions for problems involving uncertain inputs or outcomes by using decision making techniques.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Overview of AI** **1.1** What is Artificial Intelligence? Philosophy of AI, Goals of AI , What Contributes to AI?. **1.2** Programming Without and With AI, What is AI Technique? , Applications of AI, History of AI. What is Intelligence? **1.3** Types of Intelligence, What is Intelligence Composed of? **1.4** Difference between Human and Machine Intelligence	**08**
Module -2:	**Module -2: Research areas of AI** **2.1** Real Life Applications of Research Areas, Task Classification of AI, Artificial Intelligence **2.2** What are Agent and Environment? , Agents Terminology, Rationality, **2.3** What is Ideal Rational Agent? ,The Structure of Intelligent Agents, **2.4** The Nature of Environments, Properties of Environment.	**07**

Module -3:	**Module -3:** **Expert systems** **3.1** Overview of Search Algorithm, What are Expert Systems? , Capabilities of Expert Systems. **3.2** Components of Expert Systems Knowledge Base , Inference Engine ,User Interface **3.3** Expert Systems Limitations, Applications of Expert System , Expert System Technology . **3.4** Development of Expert Systems: General Steps, Benefits of Expert Systems.	**08**
Module -4:	**Module -4: Robotics** **4.1** What are Robots? What is Robotics? , ,Robot Locomotion , Components of a Robot **4.2** Artificial Intelligence in Robotics, Computer Vision, Tasks of Computer Vision, **4.3** Application Domains of Computer Vision, Applications of Robotics, What are Artificial Neural Networks (ANNs)? **4.4** Basic Structure of ANNs, Types of Artificial Neural Networks, Applications of Neural Networks	**07**

Reference Books:-

1. Rich, Elaine, and Kevin Knight. *Artificial Intelligence*. 2nd ed. New Delhi: Tata McGraw-Hill.
2. Luger, George F. *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*. 4th ed. Asia: Pearson Education.
3. Patterson, D. W. *Introduction to Artificial Intelligence and Expert Systems*. 2nd ed. New Delhi: PHI Learning.
4. Yao, Mariya, Adelyn Zhou, and Marlene Jia. *Applied Artificial Intelligence: A Handbook for Business Leaders*. Palo Alto, CA: TOPBOTS.

Evaluation Pattern:

Total Marks: 100 / 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 359

Course Objectives :

2) understand Visual effects and moving images.

3) understand production program and comprehensive picture of the VFX production

4) study of visual effects of adobe after effect.

5) Understand 3D visualization and digital compositing.

Course Outcomes:

1) learn how to synchronize animations with audio, using sound design tools to enhance their motion graphics projects.
2) to create dynamic text animations, explore advanced typography techniques, and design visually compelling titles and lower thirds.
3) develop a streamlined workflow, including using After Effects templates, pre compositions, and organizing assets efficiently for smooth project management.
4) Students will enhance their ability to solve creative challenges using After Effects tools and techniques to visually tell a compelling story through animation and compositing.

Lab Course	Title and Contents	Hrs
BASP 359	1.Work with Composition in After Effect.	**30**
	2.Create and Animate Text in After Effect.	
	3.Build Custom Transition in After Effect.	
	4.Create custom Effect in After Effect.	
	5.Animate position, Scale, rotation, and opacity of objects using Adobe After Effect.	
	6.Create Animated Background in After Effect.	
	7.Select and Animate Layers in After Effect.	
	8.Create Text effect in After Effect.	
	9.Add Text with Formatting and Effects in After Effect.	
	10.Create Energetic Titles in After Effect.	

Reference Books:-

1.Adobe Creative Team. *Adobe After Effects Classroom in a Book (2020 release)*. San Jose: Adobe Press, 2020.

2.Shaughnessy, Tom, and Trish Meyer. 2012. *Motion Graphics: Principles and Practices from the Ground Up*.

San Francisco: New Riders.
3. Rutter, Stuart. 2017. *After Effects for Designers: Graphic and Interactive Design in After Effects*. Berkeley, CA: New Riders.
4. Richardson, David. 2019. "Exploring the Intersection of Design and Technology in Motion Graphics." *Journal of Digital Media* 18 (2): 102–110. https://doi.org/10.1080.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 359

Course Objectives :

1) understand market strategy & planning.
2) introduce students to marketing operations.
3) to prepare students for industry readiness by integrating practical assignments that mimic real-world marketing challenges and agency work.
4) apply Research to Real-World Business Problems

Course Outcomes:

1) Create product packaging in flash and related software's.
2) Create research level data base for personal growth and programming
3) Create effective marketing strategies and campaigns using digital tools, including content creation for social media and email marketing.
4) Design and conduct basic market research projects, including questionnaire development, data collection, and analysis.

Lab Course	Title and Contents	Hrs
BASP 359	1.Discuss briefly the meaning of marketing research. Explain its significance in Modern times.	**30**
	2.What are the limitations of marketing research?	
	3.Explain in details the process of marketing research?	
	4.Discuss in detail ethical issues in Marketing Research.	
	5.Briefly describe steps involved in Marketing Research.	
	6.Discuss different types of sampling methods.	
	7.Discuss in detail various methods of probability and no probability sampling.	
	8.What different types of personal interviewing methods are used in marketing research?	
	9.Describe the problems of Indian Rural market.	
	10.Discuss the difference between cross-sectional & longitudinal research designs.	

Reference Books:-

1) Kotler, Philip, and Kevin Lane Keller. 2016. *Marketing Management*. 15th ed. Harlow, England: Pearson Education.
2) Armstrong, Gary, and Philip Kotler. 2017. *Marketing: An Introduction*. 13th ed. Boston: Pearson.
3) Solomon, Michael R. 2017. *Consumer Behavior: Buying, Having, and Being*. 12th ed. Boston: Pearson.
4) Lamb, Charles W., Joseph F. Hair, and Carl McDaniel. 2017. *Marketing*. 13th ed. Boston: Cengage Learning

Evaluation Pattern:

Total Marks: 50
End Semester Examination: • Question -1 (20 M) • Question -2 (20 M) • Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 359

Course Objectives :

1) introduce students to Autodesk Maya's interface and essential tools for 3D modeling and texturing.
2) develop fundamental skills in polygon, NURBS, and subdivision surface modeling to create accurate 3D forms.
3) apply industry-standard modeling techniques for creating both hard surface and organic models.
4) teach effective UV mapping and unwrapping workflows for clean, efficient texturing.

Course Outcomes:

1) Demonstrate proficiency in navigating and using Autodesk Maya for 3D modeling and texturing tasks.
2) Create accurate 3D models using polygonal, NURBS, and subdivision modeling techniques.
3) Design and model both hard surface and organic objects with clean topology and efficient geometry.
4) Perform UV mapping and unwrapping operations to prepare models for detailed and seamless texturing

Module	Title and Contents	Hrs
BASP 359	1.Working with Polygon Modeling	**30**
	2.Polygon :- Selection, Creation, combining, separating, Splitting and Editing	
	3.Working with Nurbs Modeling	
	4.Nurbs :- Creating curves, Creating Surfaces, Editing , Trimming,	
	5.Stitching and Sculpting surface meshes	
	6.Subdivision Surface Modeling in Maya.	
	7.UV Mapping Overview	
	8.UV Mapping	
	9.UV Editing	
	10.UV sets	

Reference Books:-

1. Birn, Jeremy. 2017. *Digital Lighting and Rendering*. 3rd ed. San Francisco: New Riders.
2. Beane, Andy. 2012. *3D Animation Essentials*. Indianapolis: Wiley.
3. Derakhshani, Dariush. 2020. *Autodesk Maya 2020 Basics Guide*. Mission, KS: SDC Publications.

4. Montero, Enrique, and David S. Ebert. 2014. *Texturing and Modeling: A Procedural Approach*. 4th ed. Burlington, MA: Morgan Kaufmann.
Evaluation Pattern:
Total Marks: 50
End Semester Examination: • Question -1 (20 M) • Question -2 (20 M) • Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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

Faculty of Science & Technology

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Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 359

Course Objectives :

1) implement fundamental AI algorithms such as search strategies, decision trees, and optimization techniques using suitable programming languages and tools.
2) develop practical skills in machine learning by applying supervised and unsupervised learning methods on real-world datasets for prediction, classification, and clustering tasks.
3) utilize AI libraries and frameworks (such as TensorFlow, Scikit-learn, or PyTorch) to design, train, and evaluate intelligent systems.
4) analyze and interpret the results of AI models and understand the ethical considerations and limitations of AI applications in various domains.

Course Outcomes:

1) apply machine learning techniques including classification, regression, clustering, and dimensionality reduction on real-world datasets.
2) use AI frameworks and libraries such as Scikit-learn, TensorFlow, or PyTorch to build intelligent systems.
3) preprocess and analyze datasets effectively using techniques like normalization, encoding, and feature extraction.
4) train, validate, and evaluate AI models using appropriate metrics and cross-validation techniques.

Lab Course	Title and Contents	Hrs
BASP 359	1.Emotion-based Emoji Animation.	**30**
	2.Character Movement Prediction.	
	3.Character Motion Capture:	
	4.Gesture-based Animation.	
	5.Facial Expression Recognition	
	6.Pattern based Animation.	
	7.Sound based Animation.	
	8.Voice-controlled Animation	
	9.Animal movement Animation.	
	10.Image-based Animation.	

Reference Books:-

1. Russell, Stuart J., and Peter Norvig. 2021. *Artificial Intelligence: A Modern Approach*. 4th ed. Hoboken, NJ: Pearson.
2. Géron, Aurélien. 2019. *Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems*. 2nd ed. Sebastopol, CA: O'Reilly Media.
3. Chollet, François. 2021. *Deep Learning with Python*. 2nd ed. Shelter Island, NY: Manning Publications

4. VanderPlas, Jake. 2016. *Python Data Science Handbook: Essential Tools for Working with Data*. Sebastopol, CA: O'Reilly Media.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASPVSC III : Maya Modelling

Course Objectives :

1) to introduce students to the Autodesk Maya interface and essential tools used in 3D modeling.
2) to develop fundamental skills in polygonal and NURBS modeling techniques for creating basic to complex 3D objects.
3) to provide hands-on experience in creating 3D models of real-world and imaginative objects, environments, and characters.
4) to enhance students' understanding of topology, edge flow, and mesh optimization for animation and game-ready models.

Course Outcomes:

1) to introduce students to the Autodesk Maya interface and essential tools used in 3D modeling.
2) to develop fundamental skills in polygonal and NURBS modeling techniques for creating basic to complex 3D objects.
3) to provide hands-on experience in creating 3D models of real-world and imaginative objects, environments, and characters.
4) to enhance students' understanding of topology, edge flow, and mesh optimization for animation and game-ready models.

Module	Title and Contents	Hrs
BASPVSC III	1.Model a Simple Apple or Pear	**60**
	2.Create a Low-Poly Human Head	
	3.Model a Basic Fish or Dolphin	
	4.Sculpt a Hand with Basic Anatomy	
	5.Create a Stylized Mushroom or Tree	
	6.Model a Realistic Human Face	
	7.Create a Fantasy Creature (e.g., dragon head)	
	8.Model a Cartoon-style Animal (e.g., dog, cat)	
	9.Design and Model a Human Torso with Muscle Detail form.	
	10.Model a Realistic Bird (e.g., owl or eagle)	
	11.Create a Full-body Character in T-Pose	
	12.Model a Detailed Insect (e.g., grasshopper or beetle)	

	13.Create a Sculpted Bust with High-resolution Details (using Mudbox/ZBrush and importing to Maya)	
	14.Model a Dinosaur (e.g., T-Rex or Velociraptor)	
	15.Model a Realistic Horse or Elephant	
	16.Design and Model a Fantasy Character with Accessories	
	17.Create a Stylized Monster for a Game	
	18.Recreate a Famous Sculpture (e.g., Michelangelo's David - bust or hand)	
	19.Create a Nature Scene with Organic Elements	
	20.Build a Mythical Creature Hybrid (e.g., centaur, mermaid)	

Reference Books:-

1. Daris, Todd Palamar. *Mastering Autodesk Maya 2016*. Indianapolis: Sybex, 2015.
2. Daris, Todd Palamar. *Autodesk Maya 2020 Basics Guide*. Mission, KS: SDC Publications, 2020.
3. Dariush Derakhshani. *Introducing Autodesk Maya 2016*. Indianapolis: Sybex, 2015.
4. Birn, Jeremy. *Digital Lighting and Rendering*. 3rd ed. San Francisco: New Riders, 2013.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Programme: B.Sc.	**Semester** - V
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASPVSC IV : Maya Inorganic Modelling

Course Objectives :

1) to introduce students to the principles and techniques of inorganic (hard surface) modeling using Autodesk Maya.
2) to develop proficiency in creating accurate and realistic 3D models of man-made objects such as vehicles, furniture, buildings, and machinery.
3) to train students in the use of polygonal modeling tools and modifiers suited for inorganic structure development.
4) to enhance understanding of form, scale, proportion, and detailing in the creation of mechanical and architectural assets.

Course Outcomes:

1) understand and apply the fundamental concepts of inorganic (hard surface) modeling using Autodesk Maya.
2) create accurate and detailed 3D models of non-organic objects such as vehicles, furniture, weapons, and buildings.
3) use polygon modeling tools effectively to construct hard-surface models with correct geometry and clean topology.
4) interpret and use reference images and blueprints to model inorganic assets with proper scale and proportion.

Lab Course	Title and Contents	Hrs
BASPVSC IV	1.Model a Simple Table and Chair.	**60**
	2.Create a Low-Poly Treasure Chest.	
	3.Model a Classic Door with Frame and Handle.	
	4.Design a Simple Vase or Bottle.	
	5.Model a Basic Toolbox with Tools (Hammer, Wrench, etc.)	
	6.Model a Desktop Computer Setup (Monitor, CPU, Keyboard, Mouse)	
	7.Design a Kitchen Scene (Stove, Sink, Fridge).	
	8.Model a Mechanical Fan with Blades and Stand.	
	9.Create a Street Light with Base, Pole, and Lamp Head.	

	10.Model a Vintage Radio or Speaker System.	
	11.Model a Realistic Car or Bike.	
	12.Create a Sci-fi Weapon (Gun, Blade, or Shield).	
	13.Model a Steampunk-style Machine or Contraption.	
	14.Model a Construction Vehicle (Bulldozer, Crane, etc.).	
	15.Create a Spacecraft or Fighter Jet.	
	16.Model a Modern Living Room Interior.	
	17.Design a Medieval Castle or Fort Entrance.	
	18.Create a Sci-fi Environment (e.g., spaceship corridor).	
	19.Model an Old-style Telephone Booth or Vending Machine.	
	20.Build a Small Urban Street Scene.	

Reference Books:-

1. Birn, Jeremy. *Digital Lighting and Rendering*. 3rd ed. San Francisco: New Riders, 2013.
2. Osipa, Jason. *Stop Staring: Facial Modeling and Animation Done Right*. 3rd ed. Indianapolis: Wiley, 2010.
3. Pluralsight. *Hard Surface Modeling in Maya*. Online course. Accessed April 2025. https://www.pluralsight.com.
4. Autodesk Knowledge Network. *Maya Documentation and Tutorials*. Accessed April 2025. https.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Programme: B.Sc	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 361 : Maya Rigging& Animation

Course Objectives:

1) recognize tools and techniques of Maya rigging.
2) classify principles of animation for 3D Animation.
3) analyses Maya lighting parameters and values
4) understand mental ray, V- ray or Arnold renderer.

Course Outcomes:

1) classify and Compare types of 3D Rigging.
2) understand and analyses IK and Fk Rigging.
3) inferred and apply principles of animation for character animation.
4) produce 3D Design and animation using rendering parameters.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Types and techniques of rigging** **1.1** Basic study Elements of Rigging tools, constrains and types, Understanding Rigging, Creating and Organizing Joint Hierarchies, Orienting Joints. **1.2** Naming Joints, Mirroring Joints, Rigging the Giraffe, IK Legs, FK Blending. **1.3** Rotate Plane Solvers, Creating Custom Attributes, Spline IK, Full Body Inverse. **1.4** Kinematics, Skinning Geometry, Interactive/Smooth Binding, Painting Skin Weights.	08
Module -2:	**Module -2: Procedural 3D Animation** **2.1** Introduction to Animation tools – Principles of Animation, Using Joints and Constraints. **2.2** Inverse Kinematics, Driven Keys, Key frame Animation, Graph Editor, play blast and F Check, Animation Using Expressions, Motion Path Animation **2.3** Animating Constraints, Animation Layers, Animating Facial Expressions Using Blend Shapes, Animating with Lattices. **2.4** Animating Object Components with Clusters, animating a Scene Using Nonlinear Deformer	07
Module -3:	**Module -3: 3D Lighting** **3.1** Introduction to light, Principle of light Types of light Shadows – Types of Shadows **3.2** Understanding material & lights – Software Lighting – Mental ray lighting **3.3** Final Gather – Global illumination – Caustics -- Vary lighting –HDRI – SSS Shader	08
Module -4:	**Module -4: Types and techniques of Rendering** **4.1**Introduction to Rendering – Render layers - Software Rendering – Mental ray Rendering **4.2** Types of Render passes – Diffuse Passes – Specular passes – Shadow passes – Occlusion passes – Use Background matting	07

Reference Books:

1. Kelly, L. *"Types and Techniques of Rigging."* In *3Ds Maya Bible*, edited by Kelly L., 1–130. America: John Wiley & Sons, May 23, 2018. ISBN-10: 076453645.
2. Kelly, L. *Autodesk Maya 2022 Basics Guide*, edited by Murdock, 89–213. America, May 2022.
3. Tickoo, Sham. *Autodesk Maya 2022*. Purdue University and CADCIM Technologies, August 1, 2021. Kindle Edition. ASIN: B09BPVC9HG.
4. Boughen, Nicholas. *3Ds Maya Lighting*. Edited by Nicholas Boughen. America: Word ware Publishing Inc. January 17, 2018.

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

Karmaveer Bhaurao Patil University, Satara

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

Faculty of Science & Technology

Yashwantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 362 : Rotoscoping

Course Objectives:

1) Understand use of rotoscoping for project
2) Understand Interface of Silhouette.
3) Inferring plugins for rotoscoping.
4) Comparing task between Silhouette and Mocha pro.

Course Outcomes:

1) Recall and identify Unity's 2D tools and components.
2) Describe the process of importing, organizing, and managing 2D assets in Unity.
3) Demonstrate the ability to create a basic 2D game level using Unity's tile map system and 2D sprite tools.
4) Analyze the relationship between different Unity components.

Module	Title and Contents	Hrs
Module -1:	**Module -1: 2D in Unity** **1.1** Introduction to 2D games, 2D graphics, 2D physics, game development, project setting for 2D games **1.2** 2D game creation workflow, Unity Editor interface, toolbar, manipulating objects, **1.3** Unity projects, Assets and scene, fundamentals, scripting, sprites **1.4** building in-game environment, character animation, graphics, audio.	08
Module -2:	**Module -2: Fundamentals of games** **2.1** Scenes, painting levels, level testing, Game Objects, Prefabs, sprite Renderer, cameras, **2.2** Collider 2D, Importing and setting up Sprites, Sprite Atlas, 9-slicing, Tile map, 2D Tile map Extras, Isometric Tile maps **2.3** Sprite Shape Character animation, Frame-by-frame, Cutout, Skeletal, Graphics, Lighting, Shadows, Particle systems, post-processing.	07
Module -3:	**Module -3: Sprites and Tile maps** **3.1** Rigid body 2D, Collider 2D, Triggers, 2D Joints, 2D Effectors, Audio. **3.2** 2D game perspectives, reference, 2D game art style reference, Image. **3.3** import as sprites, Sprites sorting order, Sprite renderer, Placeholder sprites, sprite editor, custom outline, custom physics shapes. **3.4** tile maps in unity, working with tile maps, hexagonal tile maps, isometric tile maps.	08

Module -4:	**Module -4: Publishing** **4.1** 2D renderer sorting, Overview, Transparent Queue Sorting Order by Priority. **4.2** Sorting Layer and Order in Layer, Specify Render Queue, Distance to Camera. **4.3** rendering pipeline, post-processing and full-screen effects, color, Graphics performance and profiling. **4.4** Platform development, Cross-platform features and considerations.	07

Reference Books:

1) Franz Lanzinger. *2D Game Development with Unity*. Boca Raton, FL: CRC Press, 2020. https://www.taylorfrancis.com/books/mono/10.1201/9780429328664/2d-game-development-unity-franz-lanzinger.Game Coding Complete – 4th Edition-By Mike McShaffry and David Graham
2) Ashley Godbold and Simon Jackson. *Mastering Unity 2D Game Development*. Birmingham, UK: Packt Publishing, 2016. https://www.amazon.in/Mastering-Unity-2D-Game-Development/dp/1786463458.
3) Jared Halpern. *Developing 2D Games with Unity: Independent Game Programming with C#*. Berkeley, CA: Apress, 2018. https://www.oreilly.com/library/view/developing-2d-games/9781484237724/.

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 367 : Maya Rigging& Animation

Course Objectives :

1) understand Maya rigging and character overview.
2) understand Inverse kinematics and forward kinematics.
3) to train students in the use of constraints, set driven keys, and custom attributes for automating rig behavior and improving animation workflows.
4) to provide hands-on experience in skinning, weight painting, and managing deformations for realistic movement of 3D characters.

Course Outcomes:

1) understand the layout, panels, and timeline in Animate CC.
2) learn to create movie clip, button, and graphic symbols for animation reuse.
3) demonstrate shape transitions using shape tweening.
4) manage multiple animation layers and organize timeline efficiently.

Lab Course	Title and Contents	Hrs
BASP 363	1.Character setup overview with Building and posing skeleton.	**60**
	2.Creating basic rig Bone System and Applying Fk and IK solvers.	
	3.Skinning and painting Skin weight.	
	4.Constraint.	
	5.Deformers.	
	6.Rigging Male or female body.	
	7.Rigging Animal body	
	8.Creating architectural walkthrough with lighting	
	9.Create a basic walk cycle.	
	10.Animating Facial Expression in 3d maya.	
	11.Basic Joint Chain Creation.	
	12.FK (Forward Kinematics) Rig Setup.	
	13. IK (Inverse Kinematics) Rig Setup.	
	14.Rigging a Biped Character.	

	15.Object Constraints in Animation.	
	16.Animating a Character Jump.	
	17.Camera Animation and Scene Staging.	
	18.Animating a Character Jump.	
	19.Cloth Simulation with nCloth.	
	20.Rig and Animate a Mechanical Object.	

Reference Books:-

1. Williams, Richard. *The Animator's Survival Kit: A Manual of Methods, Principles and Formulas for Classical, Computer, Games, Stop Motion and Internet Animators*. London: Faber and Faber, 2001.
2. Dmitriev, Konstantin. *Synfig Studio – Beginner's Guide*. Packt Publishing, 2012.
3. Bakich, Myke. *How to Cheat in Adobe Animate CC: Get Professional Results Without Breaking the Bank*. Burlington, MA: Focal Press, 2017.
4. abrecque, Joseph. *Learn Adobe Animate CC for Multiplatform Animations*. Berkeley, CA: Apress, 2016.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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

Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 368 : Rotoscoping

Course Objectives :

1. understand construction of bone system with painting Skin weight
2. understand Silhouette FX Roto techniques.
3. create Clean and Accurate Mattes.
4. understand the Fundamentals of Rotoscoping

Course Outcomes:

1. Demonstrate a strong understanding of the role and importance of rotoscoping in the VFX production pipeline.
2. Create clean, detailed mattes for moving subjects with attention to edge detail, feathering, and shape consistency.
3. Organize roto shapes using grouping and layering for better scene management and workflow efficiency.
4. Export roto mattes and integrate them effectively into compositing projects.

Lab Course	Title and Contents	Hrs
BASP 364	1.Point Track in Silhouette FX Roto.	60
	2.Planer Track in Silhouette FX Roto.	
	3.Mocha Track in Silhouette FX Roto.	
	4.Stereo (3d conversion) Rotoscoping in Silhouette FX Roto. (Output in Color, Grey, Alpha).	
	5.VFX (Green Screen Croma) Rotoscoping in Silhouette FX Roto (Output in Color, Grey, Alpha).	
	6.Clean plate in Silhouette FX Roto.	
	7.Motion Blur in Rotoscoping in Silhouette FX Roto.	
	8.Basics of the Remove Module With mocha pro.	
	9.Tracking and Screen Replacement with Mocha for After effect.	
	10.Stabilize 360 video with Mocha pro.	
	11.use the Paint node in Silhouette to fix and improve video frames.	
	12.Clean plate in Silhouette FX Roto.	
	13.Motion Blur in Rotoscoping in Silhouette FX Roto.	
	14.Tracking in mocha pro.	

	15.Creating mask using mocha pro.	
	16.Basics of the Remove Module With mocha pro.	
	17.Using mega plates with Remove Module in mocha pro.	
	18.Tracking and Screen Replacement with Mocha for After effect.	
	19.Stabilize 360 video with Mocha pro.	
	20.Rendering sequence in Silhouette Create a Pause and Resume.	

Reference Books:-

1. Adobe Creative Team. *Adobe After Effects Classroom in a Book (2020 release)*. San Jose: Adobe Press, 2020.
2. Shaughnessy, Tom, and Trish Meyer. *Motion Graphics: Principles and Practices from the Ground Up*. San Francisco: New Riders, 2012.
3. Rutter, Stuart. *After Effects for Designers: Graphic and Interactive Design in After Effects*. Berkeley: New Riders, 2017.
4. Richardson, David. "Exploring the Intersection of Design and Technology in Motion Graphics." *Journal of Digital Media* 18, no. 2 (2019): 102-110. https://doi.org/10.1080/20950128.2019.1674285.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashwantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 363: AR for Animation

Course Objectives:

1) understand the composition, timeline, and layers structure.
2) apply principles of motion such as easing, anticipation, and follow-through.
3) design and animate custom text and shapes
4) composite multiple layers for visual effects.

Course Outcomes:

1) classify and Compare types of 3D Rigging.
2) understand and analyses IK and Fk Rigging.
3) inferred and apply principles of animation for character animation.
4) produce 3D Design and animation using rendering parameters.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Types and techniques of rigging** **1.1** Basic study Elements of Rigging tools, constrains and types, Understanding Rigging, Creating and Organizing Joint Hierarchies, Orienting Joints. **1.2** Naming Joints, Mirroring Joints, Rigging the Giraffe, IK Legs, FK Blending. **1.3** Rotate Plane Solvers, Creating Custom Attributes, Spline IK, Full Body Inverse. **1.4** Kinematics, Skinning Geometry, Interactive/Smooth Binding, Painting Skin Weights.	08
Module -2:	**Module -2: Procedural 3D Animation** **2.1** Introduction to Animation tools – Principles of Animation, Using Joints and Constraints. **2.2** Inverse Kinematics, Driven Keys, Key frame Animation, Graph Editor, play blast and F Check, Animation Using Expressions, Motion Path Animation **2.3** Animating Constraints, Animation Layers, Animating Facial Expressions Using Blend Shapes, Animating with Lattices. **2.4** Animating Object Components with Clusters, animating a Scene Using Nonlinear Deformer	07
Module -3:	**Module -3: 3D Lighting** **3.1** Introduction to light, Principle of light Types of light Shadows – Types of Shadows **3.2** Understanding material & lights – Software Lighting – Mental ray lighting **3.3** Final Gather – Global illumination – Caustics -- Vary lighting –HDRI – SSS Shader	08
Module -4:	**Module -4: Types and techniques of Rendering** **4.1** Introduction to Rendering – Render layers - Software Rendering – Mental ray Rendering **4.2** Types of Render passes – Diffuse Passes – Specular passes – Shadow passes –	07

	Occlusion passes – Use Background matting	

Reference Books:

1. Kelly, L. *"Types and Techniques of Rigging."* In *3Ds Maya Bible*, edited by Kelly L., 1–130. America: John Wiley & Sons, May 23, 2018. ISBN-10: 076453645.
2. Kelly, L. *Autodesk Maya 2022 Basics Guide*, edited by Murdock, 89–213. America, May 2022.
3. Tickoo, Sham. *Autodesk Maya 2022*. Purdue University and CADCIM Technologies, August 1, 2021. Kindle Edition. ASIN: B09BPVC9HG.
4. Boughen, Nicholas. *3Ds Maya Lighting*. Edited by Nicholas Boughen. America: Word ware Publishing Inc. January 17, 2018.

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashwantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 364 : VR for Animation

Course Objectives:

1) understand applications and overview of virtual reality
2) understand difference between 6DOF and 360
3) understand capturing movement process using different tools and techniques.
4) study on Models rasterization and Latency.

Course Outcomes:

1) Understand VR systems work and list the applications of VR.
2) Understand the design and implementation of the hardware that enables VR systems to be built.
3) Create motion and tracking in VR systems.
4) Create interaction Video using Vuforia VR systems.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Introduction of Virtual Reality** **1.1** Defining Virtual Reality, History of VR, Human Physiology and **1.2** Perception, Key Elements of Virtual Reality Experience, Virtual Reality System, **1.3** Interface to the Virtual World-Input & output- Visual, Aural & Haptic Displays. **1.4** Applications of Virtual Reality.	08
Module -2:	**Module -2: Representing the Virtual World** **2.1** Representation of the Virtual World **2.2** Visual Representation in VR, Aural Representation in VR and Haptic **2.3** Representation in VR	07
Module -3:	**Module -3: The Geometry of Virtual Worlds &The Physiology of Human Vision** **3.1** The Geometry of Virtual Worlds &The Physiology of Human Vision **3.2** Geometric Models, Changing Position and Orientation, Axis-Angle Representations of Rotation.Viewing Transformations, Chaining the Transformations **3.3** Human Eye, eye movements & implications for VR.	08
Module -4:	**Module -4: Visual Perception & Rendering** **4.1** Visual Perception - Perception of Depth, Perception of Motion. **4.2** Perception of Color, Combining Sources of Information Visual	07

	4.3 Rendering -Ray Tracing and Shading Models, Rasterization **4.4** Correcting Optical Distortions, Improving Latency and Frame Rates.	

Reference Books:

1. Gerard Jounghyun Kim, *"Designing Virtual Systems: The Structured Approach"*, 2005.
2. Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, *"3D User Interfaces, Theory and Practice"*, Addison Wesley, USA, 2005.
3. Oliver Bimber and Ramesh Raskar, *"Spatial Augmented Reality: Meging Real and Virtual Worlds"*, 2005.
4. Burdea, Grigore C and Philippe Coiffet, *"Virtual Reality Technology"*, Wiley Interscience, India,

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashwantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 365 : 3D Printing In Animation

Course Objectives:

1) understand the Maya Interface.
2) explore 3D Modeling Fundamentals.
3) understand the Principles of Texturing.
4) Demonstrate UV Mapping Skills.

Course Outcomes:

1) identify and describe key components of the Maya interface relevant to modeling and texturing workflows.
2) demonstrate an understanding of 3D modeling concepts such as topology, edge flow, and surface continuity.
3) create basic to intermediate 3D models using polygonal and NURBS modeling techniques in Maya.
4) apply UV unwrapping techniques to prepare 3D models for texturing with minimal distortion

Module	Title and Contents	Hrs
Module -1	**Module -1: Introduction** **1.1** Working in Maya-Creating and Editing Maya Nodes, Creating Maya Projects. **1.2** Organizing Complex Node Structures with Assets,- UV Texture Layout, What Are UV Texture Coordinates? **1.3** Mapping the Giraffe Leg . **1.4** Unfolding UVs Mapping the Giraffe Head.	08
Module -2:	**Module -2: Fundamentals of Polygonal and NURBS Modeling** **2.1** NURBS Modeling in Maya-Understanding NURBS, Employing Image Planes, **2.2** Modeling NURBS Surfaces, Creating Realism, NURBS Tessellation, Arranging UV Shells **2.3** Additional UV Mapping Considerations Transferring UVs Multiple UV Sets Optimizing Textures **2.4** Bump and Normal Mapping	07

Module -3:	**Module -3: UV Mapping and Unwrapping Essentials** **3.1** Polygon Modeling Understanding Polygon Geometry, Working with Smooth Polygons, **3.2** Using Smooth Mesh Polygons, Editing Polygon Components, Adding Components, Modeling with Deformers, Combining Meshes. **3.3** Polygon Modeling with Paint Effects Bump Maps Normal Maps Creating Normal Maps.	08
Module -4:	**Module -4: Creating and Applying Textures in Maya** **4.1** Convert NURBS Surfaces to Polygons, Boolean Operations, Sculpting Polygons Using Artisan. **4.2** Advanced Polygon Editing Tools, Using Subdivision Surfaces, Sub Displacement Maps for Characters . **4.3** Combined Displacement and Bump Maps Subsurface Scattering Fast. **4.4** Simple Skin Shader Setup Subsurface Scattering Layers	07

Reference Books:

1. Gerard Jounghyun Kim, *"Designing Virtual Systems: The Structured Approach"*, 2005.
2. Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, *"3D User Interfaces, Theory and Practice"*, Addison Wesley, USA, 2005.
3. Oliver Bimber and Ramesh Raskar, *"Spatial Augmented Reality: Meging Real and Virtual Worlds"*, 2005.
4. Burdea, Grigore C and Philippe Coiffet, *"Virtual Reality Technology"*, Wiley Interscience, India,

Evaluation Pattern:

Total Marks: 50

Internal Continuous Evaluation:	**End Semester Examination:**
• CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	• Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashwantrao Chavan Institute of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BAST 366 : UI/UX

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) describe the User interface and user experience design for digital platforms.
2) utilize the research in designing.
3) identify UI/UX tools.
4) differentiate the prototyping tools

Module	Title and Contents	Hrs
Module -1	**Module -1: Getting Started with UI/UX Design** **1.1** Working in Maya-Creating and Editing Maya Nodes, Creating Maya Projects. **1.2** Organizing Complex Node Structures with Assets,- UV Texture Layout, What Are UV Texture Coordinates? **1.3** Mapping the Giraffe Leg . **1.4** Unfolding UVs Mapping the Giraffe Head.	08
Module -2:	**Module -2: UX Design** **2.1** What us Design Thinking, What is Research in User Experience Design? **2.2** What are design Principles, What is User Centered Design, Wire framing & Storyboarding, Learning Google Material Design, **2.3** Role of a UX Designer Steps to Follow before UX Design: Requirement Gathering, Research of various techniques, Analysis, **2.4** Creating Scenarios, Flow Diagrams, Flow Mapping, Making our first UX Design Road Map	07
Module -3:	**Module -3: UV Mapping and Unwrapping Essentials** **3.1** Design Testing Methods and Techniques. Usability Testing. **3.2** Types and Process, Create plan for the Usability, What is Tests?	08

	3.3 What is Prototype and how we design it. Various Prototyping Tools, How to prepare Usability Testing? **3.4** How to understand & refine Usability Test Results?	
Module -4:	**Module -4: UX Improvement Process** **4.1** Understanding the Usability Test findings. **4.2** Applying the Usability Test feedback in, improving the design **4.3** UX Delivery Process: How to communicate with implementation team. **4.4** UX Deliverables and its process	07

Reference Books:

1. Garrett, Jesse James. *The Elements of User Experience*.
2. Unger, Russ, and Carolyn Chandler. *A Project Guide to UX Design: For User Experience Designers in the Field or in the Making*, 2nd ed.
3. Hartson, Rex, and Pardha Pyla. *The UX Book: Process and Guidelines for Ensuring a Quality User Experience*.
4. Preece, Jenny, Helen Sharp, and Yvonne Rogers. *Interaction Design: Beyond Human-Computer Interaction*.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • CCE-I 10 Marks (Convert into 5 Marks) • CCE-II 10 Marks (Convert into 5 Marks) • Mid Sem – 25 Marks (Convert into 10 Marks) **Total Marks = 20 Marks** • **CCE-I + CCE-II + Mid Sem Exam = Internal Marks**	**End Semester Examination:** • Question -1 (2*5 = 10 M) • Question -2 (2*2 = 20 M) • Question -3 (5*4 = 20 M) **Total Marks = 50 Marks convert into 30 Marks**

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Programme: B.Sc.	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 369

Course Objectives :

1) study on principles of dynamics.
2) understand different techniques of 3D modeling.
3) understand concepts of virtual reality and virtual environment.
4) to recognize and to use productively the basic tools of a 3d design application.

Course Outcomes:

1) demonstrate nature element simulations in motion graphics and other CG production.
2) recognize and to use productively the basic tools of a 3d design application.
3) understand the AR development techniques.
4) describe interaction in VR devices.

Lab Course	Title and Contents	Hrs
BASP 369	1.Create an AR holiday card in adobe aero.	30
	2.Adding motion to objects using Adobe aero.	
	3.Develop 2D animation in augmented reality using adobe aero.	
	4.Design an interactive and animated scene .	
	5.Create an AR dashboard in adobe aero.	
	6.Create an AR from a sketch in your sketch book using adobe aero.	
	7.Create an AR sticker.	
	8.Make an AR dummy product.	
	9.Make a 3D animated character for AR with Adobe Aero.	
	10.Create adobe aero Augmented Reality print flyer.	

Reference Books:-

1.O'Connell, Kharis. *Designing for Mixed Reality*. Sebastopol, CA: O'Reilly Media, Inc., 2016.
2.Siltanen, Sanni. *Theory and Applications of Marker-Based Augmented Reality*. Julkaisija – Utgivare Publisher, 2012.
3.Fowler, Allan. *VR Game Development*. 1st ed. Apress Publications, 2018.
4.Parisi, Tony. *Learning Virtual Reality*. Sebastopol, CA: O'Reilly Media, Inc., 2015.

Evaluation Pattern:

Total Marks: 50
End Semester Examination: • Question -1 (20 M) • Question -2 (20 M) • Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

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Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 369

Course Objectives :

1) to introduce students to the basic principles, history, and technological evolution of VR as it relates to digital storytelling and animation.
2) to analyze how VR is transforming the animation industry, from pre-visualization and concept art to immersive narrative experiences.
3) to understand how traditional animation storytelling structures are adapted for interactive, 360-degree, and spatial storytelling in VR.
4) to explore how VR affects user perception, emotional engagement, and narrative absorption within animated environments.

Course Outcomes:

1) demonstrate nature element simulations in motion graphics and other CG production.
2) recognize and to use productively the basic tools of a 3d design application.
3) understand the AR development techniques.
4) describe interaction in VR devices

Module	Title and Contents	Hrs
BASP 369	1.VR engines - UNITY Basics/ Google AR Core/ V uforia, etc.,	30
	2.Develop Active 3D environments.	
	3.Health care application using VR.	
	4.Human behavior using VR.	
	5.VR exercise as a standalone treatment over traditional therapy.	
	6.VR with walking on treadmill.	
	7.Design a game in VR.	
	8.VR based teaching content.	
	9.VR model creation - Marker-based applications and Location-based application.	
	10.VR model for Motion Tracking, Environmental understanding, Light estimation.	

Reference Books:-

1) O'Connell, Kharis. *Designing for Mixed Reality*. Sebastopol, CA: O'Reilly Media, Inc., 2016.
2) Siltanen, Sanni. *Theory and Applications of Marker-Based Augmented Reality*. Julkaisija – Utgivare Publisher, 2012.
3) Fowler, Allan. *VR Game Development*. 1st ed. Apress Publications, 2018.
4) Parisi, Tony. *Learning Virtual Reality*. Sebastopol, CA: O'Reilly Media, Inc., 2015.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 369

Course Objectives :

1) to develop the ability to create print-ready 3D models using tools like Autodesk Maya, Blender, or Z Brush with a focus on animation characters, props, and environments.
2) to understand and apply mesh optimization, watertight modeling, and support generation for successful 3D printing.
3) to learn slicing techniques using software like Cura, Prusa Slicer, or ChiTuBox, ensuring print accuracy, material efficiency, and proper scaling.
4) to apply printed models in a simple stop-motion or hybrid animation sequence, testing their movement and capturing real-world footage.

Course Outcomes:

1) to prepare and export their 3D models from Maya in file formats (such as STL or OBJ) compatible with 3D printers.
2) design functional, movable, or interactive objects that can be produced using 3D printing.
3) learn how to optimize mesh density and geometry for a smooth and efficient 3D printing process.
4) students will develop a mindset of iterative design, creating prototypes, testing, and refining 3D printed objects to improve functionality or aesthetic quality.

Lab Course	Title and Contents	Hrs
BASP 369	1.Create Pen model.	**30**
	2.Create Text modeling.	
	3.Create props for game design character.	
	4.Create a male body modeling.	
	5.Cartoon Character modeling.	
	6.Create semi cartoon modeling	
	7.Creating environmental background.	
	8.Create Aero plane model.	
	9.Create Car modeling.	
	10.Create Lamp modeling.	

Reference Books:-

1) Lutz, Peter M. *Maya for Dummies*. Hoboken, NJ: Wiley Publishing, 2006.
2) Kelly, Michael J. *Learning Autodesk Maya 2020: The Complete Guide to Maya*. Mission, KS: SDC Publications, 2020.
3) Park, John Edgar. *Maya 2020: The Complete Reference*. New York: McGraw-Hill Education, 2020.
4) Vaughan, William. *Digital Modeling*. Indianapolis, IN: New Riders, 2011.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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

Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASP 369

Course Objectives :

1) learn how to translate conceptual ideas into wireframes
2) create and apply design systems
3) develop skills in visual design by selecting appropriate typography
4) develop User Flows and Journeys

Course Outcomes:

1) to learn how to design user-friendly websites.
2) understand the importance of simplicity and ease of navigation.
3) understand how people interact with products and interfaces.
4) learn the different parts of UX design.

Lab Course	Title and Contents	Hrs
BASP 369	1.Create a Logo.	30
	2.Create a Landing Page.	
	3.Design a Mobile App Interface	
	4.Design a Login/Signup Screen.	
	5.Create a Dashboard Interface.	
	6.Design an E-commerce Product Page.	
	7.Build a Mobile Chat App Screen.	
	8.Design a Form with Validation Feedback.	
	9.Create an Onboarding Flow for an App.	
	10.Create a User Profile Page.	

Reference Books:-

1. Anderson, Stephen. *Seductive Interaction Design: Creating Playful, Fun, and Effective User Experiences*. Berkeley, CA: New Riders, 2011.
2. Garrett, Jesse James. *The Elements of User Experience: User-Centered Design for the Web and Beyond*. 2nd ed. Berkeley, CA: New Riders, 2010.
3. Tidwell, Jenifer. *Designing Interfaces: Patterns for Effective Interaction Design*. 2nd ed. Sebastopol, CA: O'Reilly Media, 2010.
4. Norman, Don. *The Design of Everyday Things*. Revised and expanded edition. New York: Basic Books, 2013

Evaluation Pattern:
Total Marks: 50
End Semester Examination: • Question -1 (20 M) • Question -2 (20 M) • Question -3 (5+5=10 M)

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science & Technology

Yashvantrao Chavan Institute Of Science, Satara

Board of Studies in Animation Science

Programme: B.Sc.	**Semester** - VI
Type : Major/Minor/OE etc	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: BASPVSC V : 3D Dynamics & Rendering

Course Objectives :

1) to create believable simulations by adjusting forces, collisions, and constraints within a dynamics engine.
2) to introduce students to the core principles of rigid body, soft body, particle, and fluid dynamics in 3D environments.
3) to develope the ability to balance simulation detail and rendering efficiency to meet production-quality standards without excessive resource use.
4) to design, simulate, and render a short scene or shot that demonstrates their mastery of dynamics and rendering for professional use.

Course Outcomes:

1) create rendering techniques and effects.
2) execute toon shading and mental ray shaders for maya projects.
3) simulate n-particles for real world animation.
4) create fur, hair and clothes animation using dynamics.

Module	Title and Contents	Hrs
BASPVSC V	1.Render settings with sun and sky.	60
	2.Rendering paint effects (creating grass in Maya by paint effect, shadow effect).	
	3.Designing brushes (growing flowers, adding leaves).	
	4.Applying paint effects to Maya text curves (minimum 3 types).	
	5.Toon shading (Toon fills and toon outlines) with Character.	
	6.Creating glass with help of Arnold Renderer / Mental Ray in Maya (exterior scene).	
	7.Create dynamics-ncloth (flag).	
	8.Fooling around with nparticles.	
	9.Snow & Rain simulation with nparticles.	
	10.Set up a scene with objects that fall under gravity Render It.	
	11.Bouncing Ball with Soft Body.	
	12.Adding Hair to a Character, Rendering Hair.	
	13.Creating Day and Night Scenes.	
	14.Simulate liquid water flowing into a container or interacting with objects.	
	15.Realistic Curtains in maya.	
	16.Realistic Fur on an Animal.	
	17.Fill bowl with object(using bullet dynamics).	

	18.Use particle systems to simulate a firework explosion with sparks.	
	19.Render a product, such as a cup or bottle.	
	20.Simulate ocean waves in an environment using Maya Fluids.	

Reference Books:-

1.Tickoo, Sham. *Autodesk Maya 2022*. West Lafayette, IN: Purdue University and CADCIM Technologies, 2021. Kindle edition. ASIN B09BPVC9HG. Pages 217–341.

2.Boughen, Nicholas, ed. *3Ds Maya Lighting*. Plano, TX: Wordware Publishing Inc., January 17, 2018.

3.King, Roger. *3D Animation for the Raw Beginner Using Autodesk Maya*. February 14, 2019.

Evaluation Pattern:

Total Marks: 50

End Semester Examination:

- Question -1 (20 M)
- Question -2 (20 M)
- Question -3 (5+5=10 M)