MCE Society's

Abeda Inamdar Senior College of Arts Science and Commerce

Animation Department

Certificate Course in 3D Animation

Certificate Course in 3D Animation

2021-22 (CBCS – Autonomy 21 Pattern)

Course/ Paper Title	Introduction to 3D Digital Art
Course Code	**21AUCC3DA101**
Semester	1
No. of Credits	4

Aims & Objectives of the Course

Sr. No.	Objectives
1.	To introduce the fundamentals of visual design.
2.	To develop the understanding of core concepts of modeling techniques.
3.	Understanding the observation-based approach for creating realism.
4.	Creating photorealistic outputs using various renderers.
5.	Understanding the body dynamics & principles of animation.

Expected Course Specific Learning Outcomes

Sr. No.	Learning Outcome
1.	Explore the various techniques & concepts of animation.
2.	Develop & create effective 3D art with visualization & concept.

Syllabus

Unit No.	Title with Contents	No. of Lectures
Unit I.	**Creative Development and The Digital Process**	**6**
	1. Storytelling	1

	2. Character Design	1
	3. Visual and Look Development	1
	4. Production Strategies	1
	5. The Digital Computer Animation	1
	6. The Production Process of Computer Animation	1
Unit II.	**Modeling Concept and Technique**	**15**
	1. Space, Objects, and Structures	2
	2. Moving things Around	2
	3. Lines and Curves	3
	4. Geometric Primitives	2
	5. Free-Form Objects	3
	6. Basic Modeling Utilities	3
Unit III.	**Shading and Surfacing Characteristics**	**10**
	1. Surface Shading Techniques	2
	2. Surface Color, Texture & Transparency	2
	3. Surface Reflectivity and Refractivity	2
	4. Surface Shader & Multi-Pass	2
	5. Environment Dependent Shading	2
Unit IV.	**Camera, Lighting, and Rendering Concepts**	**15**
	1. Types of Cameras	1
	2. Types of Camera Shots and Lens	1
	3. Camera Animation	2
	4. Types of Lighting Sources and Positions	1
	5. Basic Components of a Light Source	2
	6. Lighting Strategies and Mood	1
	7. Ray Tracing	1
	8. Global Illumination and Radiosity	1
	9. Image-Based Lighting	1
	10. Photorealistic and Non-Photorealistic	1
	Rendering	1
	11. Hardware Rendering	1
		1
Unit V.	**Understanding Rigging & Animation**	**15**

1. The Basic Rigging & Animation Workflow	1
2. An Introduction to Skeleton	2
3. Forward & Inverse Kinematics	2
4. Forward Kinematics and Model Animation	2
5. Rigging & Animation Hierarchical Structures	2
6. Animation Cycles	2
7. Body Mechanics	2
8. Two- & Three-Dimensional Integration	2

References:

1. The Art of 3D Computer Animation and Effects, Isaac Kerlow, Wiley Publication.
2. 3D Animation Essentials, Andy Beane, Sybex Publication.

Certificate Course in 3D Animation

2021-22 (CBCS – Autonomy 21 Pattern)

Course/ Paper Title	Introduction to Animation Fundamentals
Course Code	**21AUCC3DA102**
Semester	1
No. of Credits	4

Aims & Objectives of the Course

Sr. No.	Objectives
1.	Understanding the history & evolution of Animation.
2.	Recognize the significance of storytelling.
3.	Learn the importance of storyboarding & editorial.
4.	Observe & recognize different walk & run styles.
5.	Understanding the techniques of computer animation.

Expected Course Specific Learning Outcomes

Sr. No.	Learning Outcome
1.	Analyze different types of animation.
2.	Develop impressive 3D animation with the application of animation principles.

Syllabus

Unit No.	Title with Contents	No. of Lectures
Unit I.	**Animation Overview**	**6**
	1. Defining Animation	1
	2. Exploring the Animation Industry	1
	3. The History of 2D and 3D Animation	2
	4. The Dawn of Computer Animation	1
	5. The Foundation of Modern Computing	1
Unit II.	**Exploring Animation, Story, and Pre-visualization**	**11**
	1. Building a Good Story	2
	2. Using Principles & Traditional Animation	2
	3. Using a Script to Animate an object	2
	4. Character Animation	2
	5. Character, Goal & Conflict	2
	6. Pre-visualization Techniques in Animation	1
Unit III.	**Principles of Animation**	**8**
	1. The Craft of Animation	2
	2. The Twelve Principles	2
	3. Few More Principles	2
	4. Character Development	1
	5. Storyboarding & Editorial	1
Unit IV.	**Human Walks and Run Animation**	**15**
	1. Walk Cycles	2
	2. Walk Cycles displaying Different Moods.	3
	3. Pose to Pose	2
	4. Two People Walk Cycle Together	2
	5. Run Cycles	3
	6. Changing the pace and mood in Run Cycles	3
Unit V.	**Computer Animation Techniques**	**20**
	1. Key frame Interpolation and Parameter Curves	1
	2. Creating a Full Skeleton	1
	3. Binding the Skin to the Skeleton	2

	4. Blend Shapes & Expressions	3
	5. Hierarchical Character Animation	1
	6. Lighting and Camera Animation	1
	7. Procedural Animation	2
	8. Facial Animation	2
	9. Crowd Animation	3
	10. Interactive Animation	2
	11. Animation with A Motion Path	2

References:

1. 3D Animation for the Raw Beginner, Roger King, CRC Press Publication
2. Character Animation in 3D, Steve Roberts, Focal Press Publication

Certificate Course in 3D Animation

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Course/ Paper Title	Introduction to Entrepreneurship and soft skill
Course Code	**21AUCC3DA103**
Semester	1
No. of Credits	4

Aims & Objectives of the Course

Sr. No.	Objectives
1.	To introduce the fundamentals of entrepreneurship.
2.	To develop the ability to Understand the characteristics of the various forms of business organization
3.	To understand a structured approach towards being a successful entrepreneur.
4.	To develop a plan of launching a start-up.
5.	To develop business -solution model around the current problems
6.	To understand digital marketing as a tool for entrepreneurs.

Expected Course Specific Learning Outcomes

Sr. No.	Learning Outcome
1.	Explore various ideas and business models around the business idea.
2.	Plan the core components and elements required to start a successful start-up.

Syllabus

Unit No.	Title with Contents	No. of Lectures
Unit I.	**Fundamentals of Entrepreneurship**	**3**
	1. What is the mindset of an entrepreneur?	1
	2. Identifying a problem	
	3. Need Analysis	
	4. Sensing solution among the problems	
	5. Developing the seed "The Idea"	1
	6. Searching market moves & trend.	
	7. Understanding Creativity and Innovation	
	8. Opportunity finding and taking the right approach.	1
Unit II.	**Develop the Plan for Startup**	**7**
	1. Taking first steps to develop a business model.	3
	2. Selecting the right type for registering the business.	
	3. Business Plan: concept, format.	1
	4. Components: Organizational plan; Operational plan; Production plan; Financial plan; Marketing plan; Human Resource planning	3
Unit III.	**Branding & Marketing of Start-up**	**10**
	1. Developing a brand around the idea.	1
	2. Branding, Logo, Tagline	1
	3. Copyright, trademark, and Patent for start-up	1
	4. Planning a strategy for promoting the start-up	1
	5. The Art of negotiation and methods	1
	6. Customer Relationship Management	1
	7. Vendor Management	1
	8. Developing the minimum viable product	1
	9. Sales and marketing plan	2
Unit IV.	**Growing the Startups**	**10**
	1. Lean startup growth	2

		2. Making a growth plan for the startup.	2
		3. Concept of Franchising the startup	2
		4. Mergers and Acquisition: Concept, reasons, types.	2
		5. Reasons for failure of Mergers and Acquisitions.	2
Unit V.	**Cost, Expenses, Inventory and ROI**		**10**
		1. Unit of Sale, Unit Cost for multiple products or services	2
		2. Break even Analysis for multiple products or services.	2
		3. Computation of Working Capital	2
		4. Inventory Control and EOQ	2
		5. Return on Investment (ROI) and Return on Equity (ROE)	2
Unit VI	**Resource Mobilization**		**5**
		1. Capital Market- Primary and Secondary	1
		2. Stock Exchange- Concept, features, functions, and	1
		importance	1
		3. Securities and Exchange Board of	1
		India- History, establishment, powers	1
		4. Angel Investor: Features	
		5. Venture Capital: Features, funding	
Unit VII.	**Digital Marketing as Marketing Tool**		**15**
		1. What is Digital Marketing	3
		2. Growth of digital marketing	3
		3. Benefits of digital marketing	3
		4. Different digital marketing channels	3
		5. Setting up digital marketing budgets	3

References:

1 - Udyamita (in Hindi) by Dr. MMP. Akhouri and S.P Mishra, pub. By National Institute for Entrepreneurship and Small Business Development (NIESBUD), NSIC-PATC Campus,Okhla

2-Entrepreneurship development & management (English, Paperback, V. K. Joshi) Publisher: Jagdamba Publishing Company ISBN: 9789380280462, 9380280462

3-Entrepreneurship Paperback – 1 July 2020 by Rajeev Roy Publisher: OUP India; 3rd edition (1 July 2020) Language : English Paperback : 600 pages ISBN-10 : 0190125306

4- Safalta ki 22 Chabiyaan (In Hindi) by Dr. Rishi Aacharya pub. by Notion Press Chennai ISBN-10 : 1947027514

Magazines

1. Udyamita Samachar Patra (Monthly, Hindi), Pub. By Centre for Entrepreneurship Development, M.P. (CEDMAP), 60 Jail Road, Jhangerbad, Bhopal-462008.

2. Science Tec. Entrepreneur (A Bi Monthly Publication), Centre for Entrepreneurship Development, M.P (CEDMAP), 60 Jail Road, Jhangerbad, Bhopal - 462008

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Certificate Course in 3D Animation

2021-22 (CBCS – Autonomy 21 Pattern)

Course/ Paper Title	Practical course on 3D digital Art (Poly Modeling and Aesthetics development)
Course Code	**21AUCC3DA104**
Semester	1
No. of Credits	4

Aims & Objectives of the Course

Sr. No.	Objectives
1.	With the help of various tools & techniques of the 3D software application, one can create impressive models starting from basic to advanced, the tools allow the user to effectively manipulate the objects to get desired results.
2.	3D art looks extraordinary when it has powerful aesthetics, using various surfacing techniques one can achieve the appealing quality in the design.

Expected Course Specific Learning Outcomes

Sr. No.	Learning Outcome
1.	To effectively use various modeling tools.
2.	Using references to create models.
3.	Creating organic models with proper topology.
4.	Learn the importance of UV mapping.

Guidelines:

Sr. No.	Objectives
1.	**Lab Book:** The lab book is to be used as a hands-on resource, reference and record of assignment submission and completion by the student. The lab book contains the set of assignments which the student must complete as a part of this course.
2.	**Submission:** The assignments are to be submitted by the student in the form of a Project folder, MA, mb or OBJ Format and a final render in .JPG format. Each assignment includes the Assignment Title, Date of submission, Name of Students.
3.	**Poly Modeling:** Assignments should be done individually by the student. The submission should include Clay & Wireframe render in JPG or PNG format. **Aesthetics Development:** Assignments should be done individually by the student. Students have to texture & light the model. The submission should include the final render in JPG or PNG format.
4.	**Assessment:** Continuous assessment of laboratory work is to be done based on overall performance and lab assignments performance of students. Each lab assignment assessment will be assigned grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, and creativity.
5.	**Operating Environment:** For Poly Modeling and Aesthetics development Operating system: Windows 10 Software: Autodesk Maya

Syllabus

Unit No.	Title with Contents	No. of Lectures

Suggested List of Assignments:	90
1. Create a Scene with the help of Primitives and Splines.	7
2. Create objects using Revolve.	7
3. Create Basic Assets (Table)	7
4. Set Dressing (Small Environment)	7
5. Basic Character Modeling	7
6. Texture the Tea Table Scene (Basic Texturing)	7
7. Reflective & Refractive Objects (Basic Shading)	8
8. Basic Matchbox Unwrapping & Texturing	8
9. Background Unwrapping & Texturing	8
10. Character Face Texturing	8
11. Three Point Lighting	8
12. Interior Daylight Setup	8

References:

Books: Laboratory handbook

Certificate Course in 3D Animation

2021-22 (CBCS – Autonomy 21 Pattern)

Course/ Paper Title	Practical course on Animation Fundamentals (Character Setup)
Course Code	**21AUCC3DA105**
Semester	1
No. of Credits	4

Aims & Objectives of the Course

Sr. No.	Objectives
1.	For creating an impressive animation, one should first need to create an efficient Rig setup, which can be done using the various tools available inside the 3D application.
2.	Understanding the various techniques for animation provides the opportunity to develop powerful animation.

Expected Course Specific Learning Outcomes

Sr. No.	Learning Outcome
1.	Recognize various tools of rigging.
2.	Creating mechanical & organic rigging.
3.	Recognizing the importance of poses.
4.	Creating different animations.

Guidelines:

Sr. No.	Objectives
1.	**Lab Book:** The lab book is to be used as a hands-on resource, reference and record of assignment submission and completion by the student. The lab book contains the set of assignments which the student must complete as a part of this course.
2.	**Submission:** The assignments are to be submitted by the student in the form of a Project folder, MA, mb or OBJ Format and a final render in .JPG format. Each assignment includes the Assignment Title, Date of submission, Name of Students.
3.	**Rigging:** Assignments should be done individually by the student. The submission should include the screen recording of the setup and video format should be either MP4 or AVI. **Animation:** Assignments should be done individually by the student. The submission should include either the play blast or a compiled sequence render of animation
4.	**Assessment:** Continuous assessment of laboratory work is to be done based on overall performance and lab assignments performance of students. Each lab assignment assessment will be assigned grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, and creativity.
5.	**Operating Environment:** For Poly Modeling and Aesthetics development Operating system: Windows 10 Software: Autodesk Maya

Syllabus

Unit No.	Title with Contents	No. of Lectures
	Suggested List of Assignments:	**90**
	1. Basic Rigging (Pendulum)	10
	2. Mechanical Rigging (Toy Train)	10
	3. Bone Leg Setup (Separately)	10

	4. Bone Hand Setup (Separately)	10
	5. Basic of Skinning	10
	6. Bouncing Ball Animation	10
	7. Pose to Pose Animation	10
	8. Creating Strong Poses	10
	9. Character Animation (Walk Cycle)	10

References:

Books: Laboratory handbook

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Certificate Course in 3D Animation

2021-22 (CBCS – Autonomy 21 Pattern)

Course/ Paper Title	FX and Compositing
Course Code	**21AUCC3DA106**
Semester	1
No. of Credits	4

Aims & Objectives of the Course

Sr. No.	Objectives
1.	Dynamics are a complex physics engine inside your 3D application; dynamics describes how objects move using rules of physics to simulate real-world forces. 3D application provides powerful tools to achieve these complex simulations.
2.	Compositing is the combination of multiple layers of images or video elements to render a final still or moving image. With the help of compositing one can enhance their results to make it look photorealistic.

Expected Course Specific Learning Outcomes

Sr. No.	Learning Outcome
1.	Creating real-world simulations effects.
2.	Creating realistic looking fluids & rigid body simulations.
3.	Recognize the importance of render passes.
4.	Creating photorealistic outputs with compositing

Guidelines:

Sr. No.	Objectives
1.	**Lab Book:** The lab book is to be used as a hands-on resource, reference and record of assignment submission and completion by the student. The lab book contains the set of assignments which the student must complete as a part of this course.
2.	**Submission:** The assignments are to be submitted by the student in the form of a Project folder, MA, mb or OBJ Format and a final render in .JPG format. Each assignment includes the Assignment Title, Date of submission, Name of Students.
3.	**FX:** Assignments should be done individually by the student. The submission should include either the play blast or a compiled sequence render of simulation with lighting. **Compositing:** Assignments should be done individually by the student. The submission should include all render passes & final render in JPG, PNG or video format.
4.	**Assessment:** Continuous assessment of laboratory work is to be done based on overall performance and lab assignments performance of students. Each lab assignment assessment will be assigned grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance and creativity.
5.	**Operating Environment:** For Poly Modeling and Aesthetics development Operating system: Windows 10 Software: Autodesk Maya

Syllabus

Unit No.	Title with Contents	No. of Lectures
	Suggested List of Assignments:	**90**
	1. nParticles Simulation (Smoke)	15
	2. Fluids Simulation (Fire)	15

	3. Create nHair on Character Face	15
	4. Active and Passive Rigid Body (Break a Wall)	15
	5. Lighting Passes (Background Scene)	15
	6. Passes Compositing (Background Passes) Color Correction (Background Render)	15

References:

Books: Laboratory handbook