Shri Vaishnav Vidhyapeeth Vishwavidhyalaya, Indore

Shri Vaishnav Institute of Architecture

B. Des in Graphics and Animation

BDNGA501 – 3D Game Design - I

COURSE CODE	COURSE NAME	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	S	CREDITS
		END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BDNGA501	3D Game Design - I				100	100			5	5

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;
***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):-

CEO 1	To understand the definition and principles of Game Design.
CEO 2	This course is intended to provide skills for Game Design.

Course Outcomes (COs)

CO1	To understand the Production pipeline of Game Design
CO2	To craft compelling stories and narratives for their Games.
CO3	To create and integrate 3D animations and cinematics into their Games.

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Chairperson	**Chairperson**	**Controller of Examination**	**Registrar**
Board of Studies	Faculty of Studies	Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth
Shri Vaishnav Vidyapeeth	Shri Vaishnav Vidyapeeth	Vishwavidyalaya,	Vishwavidyalaya,
Vishwavidyalaya, Indore	Vishwavidyalaya, Indore	Indore	Indore

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BDNGA501	3D Game Design - I				100	100			5	5

Course Contents/Syllabus

1. **Unit I**
   Introduction & Overview of Game Design, Fundamental of 3D Game Design, History of Game Design, Genres of Game Design, Element & Principles of Game Design, About Mobile, PC & Console games.

2. **Unit II**
   Research, Ideation & Concept of game design, Storytelling in game design, Sketching & pre-production of game design, Production pipeline of game design.

3. **Unit III**
   Map design for game, level design for games, Game assets digital illustration, Game levels digital illustration, digital illustration of game characters,

4. **Unit IV**
   3D modeling process (game assets, game levels, game weapon, vehicle and automotive, props, exterior and interior, etc.) Character & Creature modeling.

5. **Unit V**
   Material and Texturing of game assets, UV mapping and shading of game levels, vehicle texturing, Rigging and animation of Vehicle for game, Rigging and animation of Character for game.

Reference Books

1. **The Art of Game Design** by Jesse Schell is commonly
2. **A Theory of Fun** for Game Design by Raph Koster
3. **Challenges for Game Designers** by Brenda Brathwaite, Ian Schreiber
4. **Fundamentals of Game Design** by Ernest Adams

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BDNGA502 – 3-Dimensional Modeling II

COURSE CODE	COURSE NAME	TEACHING & EVALUATION SCHEME								
		THEORY			PRACTICAL		L	T	S	CREDITS
		END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BDNGA502	3-Dimensional Modeling II				100	100			4	**4**

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):-

CEO 1	To develop abilities in 3D Modeling in the context of project requirements.
CEO 2	To enhance the understanding of the complexities of Modeling design process for production needs and develop creative artworks for projects.

Course Outcomes (COs)

CO1	To develop understanding of the 3D Modeling process.
CO2	To visualize & create hard surface modeling for production.
CO3	To achieve the skills and techniques of complex modeling objects.

Course Contents/Syllabus

Unit-I

Introduction to In-organic & hard surface modeling, modeling pipeline for production, Setting up the reference image for modeling.

Unit-II

Understanding topology and workflow, Low Poly & High Poly Modeling. Hard surface modeling for Props.

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BDNGA502	3-Dimensional Modeling II				100	100			4	4

Unit-III

Product Modeling – Design and modeled different types of product for commercial.

Unit-IV

Automotive Modeling – Vehicle Design (Bike, Care, EV-Vehicle), Sci-fi vehicles

Unit-V

Architectural Modeling – Exterior Design, Interior Design, Office Interior, Architectural assets design, Set design, 3D kiosk design

Reference Books :-

1. **3D Modeling for Beginners**: Learn Everything You Need to Know about 3D Modeling!
2. **Autodesk Maya 2023 Basics Guide**: Kelly L. Murdock
3. **Digital Modeling:** William Vaughan
4. **Getting Started in 3D with Maya :** Adam Watkins

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BDNGA503 – 3D Production

COURSE CODE	COURSE NAME	TEACHING & EVALUATION SCHEME								
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BDNGA503	3D Production				100	100			4	**4**

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Course Educational Objectives (CEOs) :-

CEO 1	To make student understand the Production Pipeline.
CEO 2	This course will explore the process, techniques and execution of 3D Animation.

Course Outcomes (COs)

CO1	The course provides a framework of the discipline by addressing the professional approach for different types of 3D Animation.
CO2	To create creative concept and visualize the same for effective 3D Animation.
CO3	To make students understand the process & technique of Production level 3D Animation workflow.

Course Contents/Syllabus

Unit-I

Introduction and overview of Production Pipeline of 3D Animation, History of 3D Animation, Discussing about first 3D Animated Film, Explore Timeline, Range Slider, Playback Control, Frame Rate in Maya, Basic Object Animation, Set Keyframe on transform properties, Understanding different types of Keyframe (Translate, Rotate, Scale).

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BDNGA503	**3D Production**				100	100			4	**4**

Unit-II

Understanding Principle of Animation, Create basic ball animation, Exploring Graph Editor and Dope Sheet in Maya, Managing animation flow by using graph editor, Create different type of ball animation, Understanding timing and spacing, Create balloon animation.

Unit-III

Animating a Pendulum in Maya, Understanding Slow In & Slow Out techniques, Creating stylize ball animation in Maya, Progressive ball animation, Stretch and Squash ball animation, Pre & Post Infinity Curve, Mechanical Animation, Camera Animation, Product Animation, Multi Camera Animation.

Unit-IV

Understanding & Overview of Character Walk Cycle Animation, Understanding Pose to Pose & Straight Ahead animation techniques, Blocking animation for character walk cycle (Leg & Hip Animation), Creating breakdown poses for character walk cycle animation, Animating character hands and spine, Adding Shoulder, Head & Eye animation.

Unit-V

Animating Stylize Walk cycle (Drunk, Attitude, Funny, Sneaky etc.) Animating Run Cycle, Animating Jump Cycle, Character Animation with props, Weight Shifting, Push & Pull animation, Lip Synchronization, Animating with Dialogue, Dynamic Poses, Creating expression with animation.

Reference Books :-

1. **Richard Williams,** The Animation Survival Kit
2. **Frank Thomas and Ollie Johnston,** Disney Animation: The Illusion of Life
3. **Don Bluth's,** The Art of Storyboard
4. **Francis Glebas,** Directing the Story
5. **Animation from Pencils to Pixels**: Classical Techniques for the Digital Animator by Tony White
6. **Adobe Flash Professional CS Bible** by Todd Perkins

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BDNGA504 - Rigging

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		THEORY			PRACTICAL		L	T	S	CREDITS
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BDNGA504	Rigging					100			3	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit;

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Course Educational Objectives (CEOs):-

CEO 1	To introduce process and techniques of 3D Rigging.
CEO 2	This course is intended to provide skills for Rigging for Games and Film.

Course Outcomes (COs)

CO1	To develop understanding of the concept, process and types of Rigging.
CO2	To make students understand about Production pipeline of 3D Rigging.
CO3	Students will understand the skills & techniques to Rig & Animate the 3D Character.

Course Contents/Syllabus

Unit I

Introduction & Overview of Rigging, Definition of Rigging, Types of Rigging, and Production pipeline of rigging process. Understanding basic requirement of rigging.

Unit II

Basic Child Parent relationship between objects, Working with multiple child objects, Working with Hierarchy, Working with Connection Editor, Rigging using utility object, Create Car Rig, Cart Rig and Helicopter wing Rig.

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BDNGA504	Rigging					100			3	3

Unit III

Understanding Constraints, Working with Parent Constraint, Point Constraint, Orient Constraint & Scale Constraint, and Create eye ball rig using Aim Constraint, Working with bone objects, Edit & Modify bone object, Create Hand & Leg setup by using bone object, Overview of IK & FK, Using IK & FK in Hand & Leg Setup,

Unit IV

Difference b/w IK & FK Kinematics. Working with single chain and rotate plane Ik solver, Exploring Set Driven Key technique, creating finger control by using set driven key. IK & FK Blending for Hand and Leg setup. Overview of Skinning, Paint Skin Weight.

Unit V

Create full Character Rig, Cartoon character Rig , Applying IK in Leg and Hand part, Creating controllers for spine part, Creating movement and controllers for legs & hands , Adding attributes, Creating controllers for Head part, Working with blend shapes to creating expression for facial rig setup, Working with Non-Linear deformers.

REFERENCE BOOKS

1. **Eric Allen, Kelly L. Murdock –** Body Language : Avanced 3D Character Rigging
2. **Kiaran Ritchie, Jake Callery, Karim Biri –** The Art of Rigging
3. **Cheryl Briggs** - An Essential Introduction to Maya Character Rigging
4. **Brad Clark, John Hood, Joe Harkins**- Inspired 3D Advanced Rigging and Deformations

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BDNGA 505 – Compositing II

	COURSE NAME	TEACHING & EVALUATION SCHEME								
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BDNGA505	Compositing II				100	100			4	**4**

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***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):-

CEO 1	To introduce the process of VFx Pipeline for productions.
CEO 2	This course is intended to provide skills and techniques for Composting

Course Outcomes (COs)

CO1	To develop understanding of the VFx Industry.
CO2	To develop creative conceptual visualization and the process of Composting for Vfx.
CO3	To make students understand the roles and responsibilities of VFx Artist.

Course Contents/Syllabus

Unit I

Introduction & overview of Vfx Industry, Vfx pipeline for production, Definition of Compositing, Layer Based and Node Based Compositing.

Unit II

Introduction to Vfx in After Effect, Definition of Roto, Exploring different Rotoscopy Techniques, Masking in After Effect, Roto out a sign board, Frame by frame masking.

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BDNGA505	**Compositing II**				100	100			4	**4**

Unit III

Roto out an object by using Roto Brush Tool, Working with rolo poly (Multi Masking Techniques), Working with Clone tool, Wire Removal & Object Removal in After Effect, Content aware fill.

Unit IV

Concept of Chroma workflow (Green & Blue Screen), Working with Chroma removal tools, Luma Key, Spill suppressor, Concept of Tracking & Matchmoving, 2D Tracking (One Point, Two Point, Corner Pin).

Unit V

Concept of 3D Tracking in After Effect, Render Passes Compositing, CG & Live Integration, Time Remapping, Color Grading & Correction, Exporting Techniques.

REFERENCE BOOKS

1. **Ron Brinkmann -** The Art of Digital Compositing
2. **Steve Wright** – Compositing Visual Effects
3. **Steve Wright** – Digital Compositing for Film & Video
4. **Jon Gress** – Digital Visual Effect & Compositing