MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL
(Formerly West Bengal University of Technology)
Syllabus of B.Sc. In VFX Film Making
(Effective from 2023-24 Academic Sessions)

Semester-V

Paper Name: Clean Ups & Matte Painting

Paper Code: BVFM 501

Credit Points -3+2

Total Contact Hours – 75

Course Objective: This course teaches advanced visual effects techniques, focusing on wire and rig removal using Clone and Foundry tools, background colour changes, garbage masking, and Luma keying for smoke and explosion footage. Students will learn Matte Painting techniques, including sky replacement, 2D set extensions, and day-to-night lighting. Emphasis is on creating clean plates, building reference libraries, and mastering workflows in digital matte painting for both interior and exterior location manipulation in a VFX studio environment.

SL No.	Course Outcome	Mapped modules
1	Remembering	M1, M2
2	Understanding the course	M1, M2, M3, M4
3	Applying the general problem	M3, M4
4	Analyze the problems	M3, M4
5	Evaluate the problems after analyzing	M3, M4
6	Create using the evaluation process	M3, M4

Module Number	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (If applicable)	Remarks (If any)
M1	Clean Plates	10	25	1, 2	2, 4		
M2	Colour Correction	15	25	2, 3, 4	4, 5		
M3	Concept of Matte Painting	10	25	3, 4, 5	4, 5		
M4	Advanced Matte Painting	10	25	3, 4, 5, 6	4, 5, 6		
		45	**100**				

MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY

Syllabus of B.Sc. in VFX Film Making (NEP Based CBCS)

Effective from Academic Session 2023-2024

Paper Name: Clean Ups & Matte Painting

Paper Code: BVFM 501

Total Credit: 3

Total Hours of Lectures: 45 hours

SL No.	Topic/Module	Hours
1	**Module 1- Clean Plates:** • Introducing On how to create and need of clean plate • The integrated Matte Channel • Multi source operators: over, mix, subtract, In, Out, atop. Masks, compositing with pre multiplied images. • Color difference method, specialized keying software, Matting techniques: garbage mattes, edge mattes, combining mattes, manipulating mattes	15
2	**Module 2- Colour Correction:** • Colour Corrections • Colour Enhancements • Colour Grading • Compositing live footage characters with different matte and 2D/3D BG	10
3	**Module 3- Concept of Matte Painting:** • Knowing about all types of Clone tool, brush tool, smudge, blur, content aware too, sharpen tool. • Introduction to Digital Painting • Creating painted representation of a landscape, set, or distant location that allows to create the illusion of an environment that is not present at the filming location. • Working on Creation of an imaginary or realistic set for filmmaking with digital or traditional painting.	10
4	**Module 4- Advanced Matte Painting:** • Line of Force – Horizontal, Vertical, Diagonal, Centrifugal, Centripetal • Dynamizations of images. Comparative Study of Image resolution • Lighting and Colour Temperature. And will go in- depth into what matte painting.	10

Suggested Reading:

1. The Basics of Matte Painting by Conrad Allan

2. Composition of Outdoor Painting by Edgar Payne

3. Vision: Color and Composition for Film by Hans Bacher

4. Color and Light: A Guide for the Realist Painter by James Gurney

5. Framed Perspective Vol.1 & Vol.2 by Marcos Mateu-Mestre

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Syllabus of B.Sc. In VFX Film Making
(Effective from 2023-24 Academic Sessions)

Paper Name: Clean Ups & Matte Painting (P)

Paper Code: BVFM 591

Total credit: 2

Total Hours of Lectures: 30 hours

Course Objective: This course teaches advanced visual effects techniques, focusing on wire and rig removal using Clone and Foundry tools, background colour changes, garbage masking, and Luma keying for smoke and explosion footage. Students will learn Matte Painting techniques, including sky replacement, 2D set extensions, and day-to-night lighting. Emphasis is on creating clean plates, building reference libraries, and mastering workflows in digital matte painting for both interior and exterior location manipulation in a VFX studio environment.

SL No.	Course Outcome	Mapped modules
1	Remembering	M1, M2
2	Understanding the course	M1, M2, M3, M4
3	Applying the general problem	M3, M4
4	Analyze the problems	M3, M4
5	Evaluate the problems after analyzing	M3, M4
6	Create using the evaluation process	M3, M4

Module Number	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (If applicable)	Remarks (If any)
M1	Clean Plates	5	25	1, 2	2, 4		
M2	Colour Correction	5	25	2, 3, 4	4, 5		
M3	Concept of Matte Painting	10	25	3, 4, 5	4, 5		
M4	Advanced Matte Painting	10	25	3, 4, 5, 6	4, 5, 6		
		30	100				

Paper Name: Clean Ups & Matte Painting (P)

Paper Code: BVFM 591

SL No.	Topic/Module	Hours
1	**Module 1- Clean Plates:** • Developing a clean plate from scratch • Setting the plate using 2D tracking	5
2	**Module 2- Colour Correction:** • Day to night conversion • Developing color correcting concept • Developing color grading concept based on scene	5
3	**Module 3- Concept of Matte Painting:** • Creating a matte painting from scratch • Developing viewpoints based on perspectives • Understanding the concept of different types of Space in matte and uses	10
4	**Module 4- Advanced Matte Painting:** • Implementing depth of field in matte painting • Understanding digital matte painting • Camera projection development • Understanding different camera angles and uses	10

Suggested Software:

1. Adobe Photoshop
2. Adobe After Effects
3. Foundary Nuke
4. Silhouette FX

Suggested Reading:

1. The Basics of Matte Painting by Conrad Allan

2. Composition of Outdoor Painting by Edgar Payne

3. Vision: Color and Composition for Film by Hans Bacher

4. Color and Light: A Guide for the Realist Painter by James Gurney

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Syllabus of B.Sc. In VFX Film Making
(Effective from 2023-24 Academic Sessions)

Paper Name: Camera Tracking & Match Moving

Paper Code: BVFM 502

Credit Points - 3+2

Total Contact Hours – 75

Course Objective: This course focuses on match moving and 3D tracking, essential VFX techniques used to track camera movement for integrating 3D elements into live-action footage. Students will learn how to collect and utilize camera movement data, allowing CG artists to seamlessly blend 3D characters with actors. The course covers the fundamentals of camera tracking, ensuring realistic interactions between live-action footage and CG elements in a professional VFX workflow.

SL No.	Course Outcome	Mapped modules
1	Remembering	M1, M2
2	Understanding the course	M1, M2, M3, M4
3	Applying the general problem	M3, M4
4	Analyze the problems	M3, M4
5	Evaluate the problems after analyzing	M3, M4
6	Create using the evaluation process	M3, M4

Module Number	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (If applicable)	Remarks (If any)
M1	2D Tracking	10	25	1, 2	2		
M2	3d Camera Tracking	15	25	2, 3	5, 6		
M3	Match Moving	10	25	4, 5, 6	5, 6		
M4	Creating Point for Tracks	10	25	4, 5, 6	5, 6		
		45	**100**				

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Paper Name: Camera Tracking & Match Moving

Paper Code: BVFM 502

Total Credit: 3

Total Hours of Lectures: 45 hours

SL No.	Topic/Module	Hours
1	**Module 1- 2D Tracking:** • 2D Motion Track, Camera Track, Object Track, Corner Points Tracking and Stabilizing. • Extract animation data from the position, rotation, and size of an image. • Using expressions, they can apply the data directly to transform and match-move another element. • Invert the values of the data and apply them to the original element - again through expressions - to stabilize the image.	10
2	**Module 2- 3d Camera Tracking:** • Working with 3d cameras, importing Maya camera, • Importing Point cloud data and constraints, With the Camera • Tracker node, you can track the camera motion in 2D sequences or stills to create an animated 3D camera or a point cloud and scene linked to the solve. • Track features, add User Tracks or tracks from a Tracker node, mask out moving objects using a Bezier or B-spline shape, and edit your tracks manually. • How Camera Tracker can solve the position of several types of cameras as well as solve stereo sequences. • Working With 3d camera. Importing Maya camera, Importing Point cloud data and constraints.	15
3	**Module 3- Match moving:** • Introducing Match moving and its uses • Understanding Perspectives and Measurements, Cameras and its functions, Focus, Shutter Speed, Angle of View, Exposure, Distance, Tripod Match moving on image sequence the position and characteristics of the camera that shot. • How to use the parallax of features tracked within the shot to ascertain this and just requires a sequence shot with a moving camera. • To calculate and reveal the 3D positions of a number of feature points within the shot. Those camera and feature points can then be used for 3D, compositing and motion graphics work, to allow seamless integration into the source shot.	10
4	**Module 4- Creating Point for tracks:** • Point clouds are a useful starting point for 3D modelling and can be helpful in positioning 3D objects into a scene. • Using the Point Cloud Generator node, • Create a dense point cloud based on the information generated by Camera Tracker and use the points to create a 3D mesh of your 2D footage.	10

Suggested Software:

1. Foundary Nuke
2. Autodesk Maya
3. 3D Equalizer

Suggested Reading:

1. The Art and Technique of Match moving: Solutions for The VFX Artist by Erica Hornung.

2. Match Moving: The Invisible Art of Camera Tracking, 2nd Edition by Tim Dobbert.

3. The Art and Technique of Match Moving by Erica Hornung.

4. Nuke 101: Professional Compositing and Visual Effects Pdf

5. Nuke User Guide by Foundry Pdf

Paper Name: Camera Tracking & Match Moving (P)

Paper Code: BVFM 592

Total credit: 2

Total Hours of Lectures: 30 hours

Course Objective: This course focuses on match moving and 3D tracking, essential VFX techniques used to track camera movement for integrating 3D elements into live-action footage. Students will learn how to collect and utilize camera movement data, allowing CG artists to seamlessly blend 3D characters with actors. The course covers the fundamentals of camera tracking, ensuring realistic interactions between live-action footage and CG elements in a professional VFX workflow.

SL No.	Course Outcome	Mapped modules
1	Remembering	M1, M2
2	Understanding the course	M1, M2, M3, M4
3	Applying the general problem	M3, M4
4	Analyze the problems	M3, M4
5	Evaluate the problems after analyzing	M3, M4
6	Create using the evaluation process	M3, M4

Module Number	Content	Total Hours	%age of questions	Covered CO	Covered PO	Blooms Level (If applicable)	Remarks (If any)
M1	2D Tracking	5	20	1, 2	2		
M2	3d Camera Tracking	5	20	2, 3	5, 6		
M3	Match moving	10	30	4, 5, 6	5, 6		
M4	Creating Point for tracks	10	30	4, 5, 6	5, 6		
		30	100				

Paper Name: Camera Tracking & Match Moving (P)

Paper Code: BVFM 592

SL No.	Topic/Module	Hours
1	**Module 1- 2D Tracking:** • Understanding Tracking • Difference between 2D tracking and 3D tracking • Object tracking • Corner points tracking • Understanding stabilization in tracking	5
2	**Module 2- 3d Camera Tracking:** • Introduction to 3D Camera Tracking • Importing Point cloud data • Track features, add User Tracks or tracks from a Tracker node	5
3	**Module 3- Match moving:** • Understanding Perspectives and Measurements • Cameras and its functions • Focus, Shutter Speed, Angle of View, Exposure, Distance match move • Understanding the concept of Focal Length • How to use the parallax of features tracked within the shot	10
4	**Module 4- Creating Point for tracks:** • How to use Point Cloud Generator node • Create a dense point cloud based on the information generated by Camera Tracker • How to fix focal length of camera	10

Suggested Software:

1. Foundary Nuke
2. Autodesk Maya
3. 3D Equalizer

Suggested Reading:

1. The Art and Technique of Match moving: Solutions for The VFX Artist by Erica Hornung.

2. Match Moving: The Invisible Art of Camera Tracking, 2nd Edition by Tim Dobbert.

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