

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 4

Paper Name: Fundamentals of Rotoscoping

Paper Code: BVFM 401&491

Credit Points - 3+2

Total Contact Hours – 75

Course Objective: This course aims to introduce students to the fundamental principles of rotoscoping in the context of visual effects (VFX) production. By the course's conclusion, students will develop a practical understanding of industry trends related to rotoscoping and its application in live-action cinema. Through hands-on exercises and theoretical instruction, students will learn the entire rotoscoping process, from initial setup to final output. They will gain proficiency in using rotoscoping software and techniques to accurately isolate elements within live-action footage, preparing them to contribute effectively to VFX projects as rotoscope artists or in related roles within the industry.

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	Fundamentals of Rotoscoping & Use of Rotoscope in VFX	7	20	1, 2	2		
M2	Human Anatomy Wise Shape Drawing	8	20	2, 3, 4	4, 6		
M3	Character Roto Technique	10	20	5, 6	4, 6		
M4	Hair Roto Techniques, Open Bezier with Stroke Width	10	20	5, 6	4, 6		

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M5	Character Roto with Help of Tracking	10	20	5	1		
		45	100				

Paper Name: Fundamentals of Rotoscoping

Paper Code: BVFM 401

Total Credit: 3

Total Hours of Lectures: 45 hours

SL No.	Topic/Module	Hours
1	Module 1- Fundamentals of Rotoscoping & Use of Rotoscope in VFX: Fundamentals of Rotoscope. Introduction to Silhouette. Layer concept and explain different Roto tools	7
2	Module 2- Human Anatomy Wise Shape Drawing: Describe human anatomy, shape drawing Technique, Layer wise shape drawing.	8
3	Module 3- Character Roto Technique: Basic Animation with Key Frame and using tools. Character roto Technique. How to Create a Matte? Alpha Matte, Set Matte & Color Matte. Final Output. Bezier hide and unhide option.	10
4	Module 4 - Character Roto with Help of Tracking: Full Body Character Roto with help of Tracking. Tracking application for Roto. Advance Motion Blur Rotoscope.	10
5	Module 5 - Hair Roto Techniques, Open Bezier with Stroke Width: Understanding hair detail with Open Bezier. Multi Frame, feather, Animated frame copy past. Double Poly Roto and using feather.	10

Suggested Reading:

1. Rotoscoping: Techniques and Tools for the Aspiring Artist by Benjamin Bratt.
2. After Effects Compositing Essentials: Rotoscoping and Edges by Mike Christopher.
3. Silhouette-v7.5 User Guide by Boris FX.
4. Digital Domain: The Leading Edge of Visual Effects - Book by Piers Bizony.

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Paper Name: Fundamentals of Rotoscoping (P)

Paper Code: BVFM 491

Total credit: 2

Total Hours of Lectures: 30 hours

Course Objective: This course aims to introduce students to the fundamental principles of rotoscoping in the context of visual effects (VFX) production. By the course's conclusion, students will develop a practical understanding of industry trends related to rotoscoping and its application in live-action cinema. Through hands-on exercises and theoretical instruction, students will learn the entire rotoscoping process, from initial setup to final output. They will gain proficiency in using rotoscoping software and techniques to accurately isolate elements within live-action footage, preparing them to contribute effectively to VFX projects as rotoscope artists or in related roles within the industry

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	Fundamentals of Rotoscoping & Use of Rotoscopy in VFX	6	20	1, 2	2		
M2	Human Anatomy Wise Shape Drawing	6	20	2, 3, 4	4, 6		
M3	Character Roto Technique	6	20	5, 6	4, 6		
M4	Hair Roto Techniques, Open	6	20	5, 6	4, 6		

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	Bezier with Stroke Width						
M5	Character Roto with Help of Tracking	6	20	5	1		
		30	100				

Paper Name: Fundamentals of Rotoscoping (P)

Paper Code: BVFM 491

SL No.	Topic/Module	Hours
1	Module 1- Fundamentals of Rotoscoping & Use of Rotoscoping in VFX: Understanding different cinematic work based on Rotoscope point of View.	6
2	Module 2- Human Anatomy Wise Shape Drawing: Shape Making Techniques Shape drawing based on object Hard edge and Soft edge concept	6
3	Module 3- Character Roto Technique: Shape drawing character making Fast Motion Roto Technique Slow Motion Roto Technique Roto Shape Morphing	6
4	Module 4 - Character Roto with Help of Tracking: Point Tracking Planner Tracking Mocha Tracking Shape Tracking Process in Rotoscope	6
5	Module 5 - Hair Roto Techniques, Open Bezier with Stroke Width: Hair Roto Technique Feather Roto Technique Motion Blur Rendering Process	6

Suggested Software:

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1. Adobe After Effects
2. Silhouette
3. Nuke

Suggested Reading:

1. Rotoscoping: Techniques and Tools for the Aspiring Artist by Benjamin Bratt.
2. After Effects Compositing Essentials: Rotoscoping and Edges by Mike Christopher.
3. Silhouette-v7.5 User Guide by Boris FX.
4. Digital Domain: The Leading Edge of Visual Effects - Book by Piers Bizony.

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Syllabus of B.Sc. In VFX Film Making
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Paper Name: Introduction to Tracking

Paper Code: BVFM 402 & 492

Credit Points - 2+2

Total Contact Hours – 60

Course Objective: This course aims to equip students with a fundamental understanding of tracking processes and workflows in the visual effects (VFX) industry. The students will develop a comprehensive grasp of the role tracking plays within the broader VFX pipeline. They will gain proficiency in various tracking techniques, including camera, object, and motion tracking. Students will cultivate the ability to identify and analyse different types of tracking shots, appreciating their significance in enhancing storytelling and visual spectacle.

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	Stereo Rotoscoping (3D Conversion) with tracking	2	20	1, 2	2, 5		

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M2	Garbage Roto and Precise Roto Concept	6	20	2, 3	2, 5		
M3	Fast Motion Roto Technique	6	20	3, 4, 5, 6	2, 5		
M4	Cloth Roto Technique	6	20	3, 4, 5, 6	2, 5		
M5	Stereo Rotoscoping and 3D Conversion Layering and techniques	10	20	3, 4, 5, 6	2, 5		
		30	100				

Paper Name: Introduction to Tracking

Paper Code: BVFM 402

Total Credit: 2

Total Hours of Lectures: 30 hours

SL No.	Topic/Module	Hours
1	Module 1 - Stereo Rotoscoping (3D Conversion) with tracking: Stereo Rotoscoping (3D Conversion) Concept and Stereo Rotoscoping task analyze and Layer Concept in Stereo Rotoscoping, purpose of layering in Stereo Rotoscoping.	2
2	Module 2 - Garbage Roto and Precise Roto Concept: Garbage Roto and Precise Roto Concept, Hard edge and soft edge concept, Manual Roto Animation Techniques (Frame Blocking).	6
3	Module 3 - Fast Motion Roto Technique: Basic Animation with Key Frame and using tools. Character roto Technique. How to Create a Matte? Alpha Matte, Set Matte & Color Matte. Final Output. Bezier hide and unhide option.	6
4	Module 4 - Cloth Roto Technique Fast Motion Roto Technique, Roto in Cloth Detail Shot Edging and Shape Fixing	6
5	Module 5 - Stereoscopy and 3D Conversion Layering and techniques: Stereoscopy 3D conversion layering technique Concept of Stereo Rotoscope layer & compositing process	10

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Suggested Software:

1. Adobe After Effects
2. Silhouette
3. Mocha

Suggested Reading:

1. Art of stereo conversion: 2D to 3D <https://www.fxguide.com/fxfeatured/art-of-stereo-conversion-2d-to-3d/>
2. Robust Semi-Automatic Depth Map Generation in Unconstrained Images and Video Sequences for 2D to Stereoscopic 3D Conversion.
3. StereoFX – survey of stereo film-making techniques - Damien Fagnou.
4. Digital 3D Stereo Guide Spiral-bound - by Michael Beech.

Paper Name: Introduction to Tracking (P)

Paper Code: BVFM 492

Total credit: 2

Total Hours of Lectures: 30 hours

Course Objective: This course aims to equip students with a fundamental understanding of tracking processes and workflows in the visual effects (VFX) industry. The students will develop a comprehensive grasp of the role tracking plays within the broader VFX pipeline. They will gain proficiency in various tracking techniques, including camera, object, and motion tracking. Students will cultivate the ability to identify and analyse different types of tracking shots, appreciating their significance in enhancing storytelling and visual spectacle.

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)

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M1	Stereo Rotoscope (3D Conversion) with tracking	6	20	2,3	2,5		
M2	Garbage Roto and Precise Roto Concept	6	20	3,4,5,6	2,5		
M3	Fast Motion Roto Technique	6	20	3,4,5,6	2,5		
M4	Cloth Roto Technique	6	20	3,4,5,6	2,5		
M5	Stereoscopy and 3D Conversion Layering and techniques	6	20	3,4,5,6	2,5		
		30	100				

Paper Name: Introduction to Tracking (P)

Paper Code: BVFM 492

SL No.	Topic/Module	Hours
1	Module 1 - Stereo Rotoscoping (3D Conversion) with Tracking: Understanding Stereo Rotoscoping Analysing Showreels Basics of Tracking in Stereo Rotoscoping	6
2	Module 2 - Garbage Roto and Precise Roto Concept: Garbage Roto Double Poly Roto Roto Animation Blocking	6
3	Module 3 - Fast Motion Roto Technique: Fast Motion Roto Technique Vertex Management Spline Animate Technique Types of Mattes – Alpha, Set & Colour	6
4	Module 4 - Cloth Roto Technique Cloth Based Shape Cloth Motion Blur Edge Blur	6
5	Module 5 – Stereo Rotoscoping and 3D Conversion Layering and Techniques: Stereo Roto Matte Render Management Depth Colour Management Showreel Submission Guideline	6

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Suggested Software:

1. Adobe After Effects
2. Silhouette
3. Mocha

Suggested Reading:

1. Art of stereo conversion: 2D to 3D <https://www.fxguide.com/fxfeatured/art-of-stereo-conversion-2d-to-3d/>
2. Robust Semi-Automatic Depth Map Generation in Unconstrained Images and Video Sequences for 2D to Stereoscopic 3D Conversion.
3. StereoFX – survey of stereo film-making techniques - Damien Fagnou.
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Paper Name: Fundamentals of Paint

Paper Code: BVFM 403 & 493

Credit Points - 2+2

Total Contact Hours – 60

Course Objective: This course aims to provide students with a foundational understanding of the visual effects (VFX) industry and its workflow, with a major focus on the fundamentals of paint/prep work. By the end of the course, students will develop a comprehensive awareness of the role of paint/prep in VFX production processes. They will gain proficiency in essential techniques and tools used in paint/prep, including wire removal, clean plate creation, and rotoscoping.

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)
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M1	Introduction to Paint	2	20	1,2	2		
M2	Making clean plate	6	20	1,2	2,5,6		
M3	Describe clean plate for VFX	6	20	3,4	2,5,6		
M4	Clean plate making for without any texture reference	6	20	3,4	2,5,6		
M5	Clean plate making for with texture reference	10	20	4,5,6	2,5,6		
		30	100				

Paper Name: Fundamentals of Paint

Paper Code: BVFM 403

Total Credit: 2

Total Hours of Lectures: 30 hours

SL No.	Topic/Module	Hours
1	Module 1- Introduction to Paint: Importance of Paint in VFX post production pipeline. Discussion on multiple type of VFX Paint techniques according to different type of shot requirements.	2
2	Module 2- Making clean plate: Describe single frame clean plate. Concept & process of making clean plate.	6
3	Module 3- Describe clean plate for VFX: Different between Paint in Photoshop and Silhouette. Why use Silhouette for Clean-up. Paint all property settings in Silhouette (Session Creating/ tools parameters for paint etc.).	6
4	Module 4- Clean plate making for without any texture reference: Describe single frame clean plate making without any texture reference.	6
5	Module 5- Clean plate making for with texture reference: Describe single frame clean plate making with any texture reference.	10

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Suggested Software:

1. Foundry Nuke
2. Adobe Photoshop
3. Silhouette

Suggested Reading:

1. Inside VFX: An Insider's View into the Visual Effects and Film Business - Book by Pierre Grage
2. Adobe Photoshop Restoration & Retouching (Voices That Matter) - Katrin Eismann (Author).
3. The Visual Effects Arsenal: VFX Solutions for the Independent Filmmaker - Bill Byrne (Author).
4. Visual Effects in A Digital World - Book by Karen E. Goulekas.

Paper Name: Fundamentals of Paint (P)

Paper Code: BVFM 493

Total credit: 2

Total Hours of Lectures: 30 hours

Course Objective: This course aims to provide students with a foundational understanding of the visual effects (VFX) industry and its workflow, with a major focus on the fundamentals of paint/prep work. By the end of the course, students will develop a comprehensive awareness of the role of paint/prep in VFX production processes. They will gain proficiency in essential techniques and tools used in paint/prep, including wire removal, clean plate creation, and rotoscoping.

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	Introduction to Paint	6	20	1,2	2		

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M2	Making clean plate	6	20	1,2	2,5,6		
M3	Describe clean plate for VFX	6	20	3,4	2,5,6		
M4	Clean plate making for without any texture reference	6	20	3,4	2,5,6		
M5	Clean plate making for with texture reference	6	20	4,5,6	2,5,6		
		30	100				

SL No.	Topic/Module	Hours
1	Module 1- Introduction to Paint: <ul style="list-style-type: none"> • Understanding the importance of Paint/prep in VFX • Describing Various Paint Process • Introduction to Software Interface (Photoshop, Nuke, Silhouette) • Grain and Noise 	6
2	Module 2- Making clean plate: <ul style="list-style-type: none"> • Clean Plate Making Process • Describing Various Tools: Clone Tool, Patch Tool, Brush Tool, Healing Tool, Content Aware Tool 	6
3	Module 3- Describe clean plate for VFX: <ul style="list-style-type: none"> • Sequence Paint Process • Wire Removal Techniques • Marker Removal Techniques • Rig Removal Techniques 	6
4	Module 4- Clean plate making for without any texture reference: <ul style="list-style-type: none"> • Color Correction • De-focus Shot Paint • Rendering 	6
5	Module 5- Clean plate making for with texture reference: <ul style="list-style-type: none"> • Project Making Guideline • Project Correction • Final Showreel Making Process 	6

Suggested Software:

1. Foundry Nuke

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2. Adobe Photoshop
3. Silhouette

Suggested Reading:

1. Inside VFX: An Insider's View into the Visual Effects and Film Business - Book by Pierre Grage
2. Adobe Photoshop Restoration & Retouching (Voices That Matter) - Katrin Eismann (Author).
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