

Course Matrix

Semester VI

Course No.	Course Type	Course Code	Course Title	Course Credit
17	DSE11	23VBB24E601	Editing with Nuke	4
18	DSE12	23VBB24E602	Roto and Paint with Nuke	4
19	DSE13	23VBB24E603	Compositing Nuke	4
20	SEC2	23VBX0C602	Ethics and Values	4
21			Applied Learning III	4
Total Credit				20

* Courses which include Practical's (Lab Programs and Exercise)

Syllabus: Semester VI

Course: Editing with Nuke
Credits: 4

Course Code: 23VBB24E601
Course Learning Hours: 120

Course Outcomes:

- CO1: Understand the working of node-based compositing.
- CO2: Work with tools and commands available.
- CO3: Appraise tools & techniques to Create and link nodes.
- CO4: Understand Color Concept.
- CO5: Work with CG+live action footages to create a shot.

Unit 1: Introduction to Node Based Workflow, GUI and Spline editor

Compositing application, Structure of Digital Images, Different between live action & CGI, Blue screen & Green screen. & their use in VFX, Understanding Interface and panels, Use of spline and graph editor,

Learning outcome: *Basic understanding of Vfx pipeline*

Unit 2: Color Correction & Enhancement – I Theory, Tools and Scope

Understanding Colors Theory, Enhancing scene and shots, various Color correction techniques, importance of color correction, and understanding scene shot and moments, defining perspectives and depth in scene, understanding the use of grid lines, concept design - Review reverse storyboards

Learning outcome: Describe reasons for color correction and instances when color correction techniques can be used.

Unit 3: Color Correction & Enhancement – II Practical

Understanding Color Concept, Color Correction Attributes, Color Modes, Color Grading & Color Matching techniques and importance, Enhance the colors of the clip,

Learning outcome: Describe the color correction process and the various nodes used for color correction based on the tonal range.

Unit 4: Keying - Procedural and tool based process

Understand Chroma color and its use, the process of removing Chroma from a footage using different tools, edge enhancement process, process of compositing a Chroma removed footage with a background

Learning outcome: Acquainted with the Chroma removal process using various nodes

Unit 5: Wire removal

Introduction to Wire Removal Process and its uses, Concept of Digital Cleanup and Paint, Wire Removal techniques.

Learning outcome: Demonstrate the clean-up process using the Clone tools and tracking mechanism while retaining the originality of the footage

Unit 6: Tracking, stabilizing and use of 3D Camera tracking data

Understand the requirement of tracking and stabilizing, working of tracking and stabilizing working of tracking and stabilizing, analyzes video sequences to extract camera motion and 3D scene data

Learning outcome: Describe all concepts of storyboarding into a clear format for an animated film, in which all visual aspects are working together.

Unit 7: 3D Camera projection

Understanding camera projection process, Camera projection is a method through which a flat image is projected on a 3D shape to get a 3D result with parallax.

Learning outcome: The student can explain how the set extension process works in combination with the camera projection process.

Unit 8: Particle Environment

Understanding 3D particles, Controlling behavior and appearance of the particles, Producing and killing the particles, rendering the particles

Learning outcome: Acquainted with the vocabulary of film language, types of shots, transitions, and narrative structure.

Unit 9: Composite - CG render passes

Understanding the advantages of using render passes, different types of render passes, Use and the process of render pass compositing

Learning outcome: *The student use various nodes according to the requirement of render pass compositing*

Unit 10: CG-Live action composite

Understand the process of merging a CG rendered character with a live plate, Use selection passes for color correcting the scene and footage, Use and manage render passes as per the requirement

Learning outcome: *Explains how a CG character is integrated on a live BG plate to create final scene.*

Course: Roto and Paintwith Nuke
Credits: 4

Course Code: 23VBB24E602 Course
Learning Hours: 120

Course Outcomes:

CO1: The fundamentals of all the spline types.

CO2: Rotoscoping methodologies including shape creation and key framing.

CO3: How to use multiple tracking methods.

CO4: How to do successfully roto a shot from beginning to end whether it be manual roto.

Unit 1: Introduction to roto static and moving shape

Create sophisticated keyframeable mattes using B-Spline, Bezier, or X-Spline shapes. Intelligent design and easy-to-use tools, such as variable per-point edge softening, assist in creating articulate animations. Render mattes with realistic motion blur or export to industry-standard shape formats.

Learning outcome: *Unlimited number of animated B-spline, X-Spline, Bezier or Freehand shapes*

Unit 2: Roto for human body using multiple shapes and IK

IK (Inverse Kinematics) for animating humans, animals and all manner of jointed creatures.

Learning outcome: *Integrated Motion Tracker that can apply motion data to points or shapes*

Unit 3: Roto for slow movement and camera Jerky/Jitter shot

Utilizing the Silhouette Planar Tracker for hard surface tracking and roto, group tracking, one and two point tracking, adding notes, and an alternative method for jittery footage.

Learning outcome: *Animation changes for one point or selected points across all key frames.*

Unit 4: Roto of hair

How to create Open Shapes with and without feathering for a detailed hair roto shot. How to speed up the creation of your open shape hair shapes using the multiframe tool, as well as tracking. Learn how to make versatile open feathered shapes to roto hair that has a lot of motion blur in the plate.

Learning outcome:*Display shape animation over image as an outline or filled color*

Unit 5: Roto for motion blur shot

How to create motion blur is the apparent streaking of moving objects in a photograph or a sequence of frames, such as a film or animation.

Learning outcome:*Demonstrate how to create Realistic motion blur in roto.*

Unit 6: Roto for 2d-3d conversion

Understand the 2D to 3D conversion (also called 2D to stereo 3D conversion and stereo conversion) is the process of transforming 2D ("flat") film to [3D](#) form, which in almost all cases is [stereo](#), the process of creating imagery for each eye from one 2D image.

Learning outcome:*Describe all concepts of stereo roto to create depth and 3d conversion process.*

Unit 7: Wire removal using rotopaint

Understand the requirement of rotoPaint, Rotopaint is a vector-based node for help with tasks like rotoscoping, rig removal, garbage matting and dustbusting. Bezier and B-Spline shapes with individual and layer group attributes, including per-point and global feather, motion blur, blending modes and individual or hierarchical 2D transformations. RotoPaint nodes also have brush, clone/reveal, blur, and dodge/burn tools.

Learning outcome:*The student can explain how the set extension process works in combination with the camera projection process.*

Unit 8: Cleanup for BG preparation

Understanding cleanup process, Copy textures from different frames to hide the unwanted elements in a scene while performing the cleanup, the degrain process and tools that are used to remove grains from a scene in Nuke

Learning outcome:*The student can remove extra props and understand use or cleanup*

Unit 9: Sequence paint and final touch up & comp in Nuke

Uses of the Clone Stamp tool, Duplicate textures from different frames, the degrain and regrain processes in NukeX

Learning outcome:*The student can explain the importance of video layering in sequence paint in*

**Course: Compositing Nuke Course code: 23VBB24E603 Course Credits: 4
Learning Hours: 120**

Course Outcomes:

CO1: Specific and measurable statements that define the knowledge

CO2: Understand *Chroma key process and color correction*.

CO3: Written with a verb phrase and declare a demonstrable action within a given time frame

CO4: Remembering and understanding matchmove technique using live and CG.

CO5: Evaluating and creating different mattes.

Unit 1: Intro to GUI using merge nodes & Transform node

An introduction to node based compositing. Using Nuke and the UI, viewers, channels, basic merge operations, nulls and no – ops. An introduction to node based compositing. Using Nuke and the UI, viewers, channels, basic merge operations, nulls and no – ops.

Learning outcome: *The student can work with tools and commands available in Nuke while creating and editing films*

Unit 2: Masking

Mattes and Roto: Generating mattes and masks and the Roto node. Creating includes and excludes and how it all works.

Learning outcome: *Work with Roto and Rotopaint nodes*

Unit 3: Roto for human body

Understanding technique used in animation to trace over live-action motion frame by frame of human body, role of rotoscoping

Learning outcome: *Explain the importance of matte overlays during the masking process*

Unit 4: Matte enhancement using Paint node for thin or hair (Alpha paint)

Introduction to rotopaint node, Working with the Stroke/Shape List, Drawing Shapes, Selecting Existing Strokes/Shapes for Editing, Animating Strokes/Shapes

Learning outcome:

Unit 5: Working with Color profiles

Importing images into Nuke. Nuke and colourspace, using the Viewer, colour sampling, colour correction basics, Understand the fundamentals of DI (Digital Intermediate) process

Learning outcome: *The Student can understand the color space of an image and work with different profiles.*

Unit 6 : Color correction nodes

How to use Nuke's color correction nodes and tools to adjust the appearance of the images in your composites,

Learning outcome: *Explain the color correction process and the various nodes used for color correction based on the tonal range.*

Unit 7 : Chroma Keying

Understand the degrain process, Understand Green and Blue screens. Understanding how Luma, Primatte , IBK Gizmo and Keylight keyers work. Basic script assembly and layout.

Learning outcome: *Can work with Chroma key technology in film production and composited onto the background footage or CGI (computer-generated imagery).*

Unit 8 : Color Matching & Channels

Understand the process of adding extra channel to a footage, understand the process of removing the extra channel from a footage, Shuffle the channels between images

Learning outcome: *The Student can work on different channels and tools to create final output.*

Unit 9 : Tracking, Stabilizing and Planar tracking

Nuke's 2D Tracker allows you to extract animation data from the position, rotation, and size of a pattern, different processes of tracking

Learning outcome: *The students will able to match motion using tracking and can remove camera shake.*

Unit 10 : Intro to 3D tracking & Matchmove

Introducing the 3D system in NUKE. Importing cameras and geometry, transforms and how to move in and out of 3d space in the same application. Rendering from the Scanline renderer

Learning outcome: *Can work with live + CG environment to create depth and match motion.*

Course: Ethics and Values
code:23VBX0C602
Course Credits: 4

Course

Learning Hours: 120

Course Outcomes:

- CO1: Explain masking and workflow of Nuke
- CO2: Understand *Chroma key process and color correction*.
- CO3: Explain planar tracking process.
- CO4: Understand 2D to 3D conversion.
- CO5: Understand stereoscopy process.

Unit 1: Introduction to Planar tracking & Mocha Interface

Introduction to mocha interface, about the different shapes in Mocha, from X-Splines and Beziers to Magnetic Shapes and actually painting a shape.

Learning outcome: *Can track motion of mask using planar tracking*

Unit 2: Tracking & stabilize technique

Understanding how a shape influences the track, Understanding stabilize technique and use, understand the importance of the layer hierarchy

Learning outcome: *Can track and stabilize scene or object.*

Unit 3: Rotoscopy workflow

Understanding technique used in animation to trace over live-action motion picture footage frame by frame, role of rotoscopy

Learning outcome: *Can do roto using tracking process.*

Unit 4: Rotoscopy for stereoscopy-1

To create realistic looking traditional style animation,

Learning outcome: *Can convert 2D scene to 3D using stereoscopy technique*

Unit 5: Rotoscopy for stereoscopy-2

Understand the relation between camera depth and stereo depth.

Learning outcome: *Can create 3D stereo shot (3D movies)*

Unit 6: Nuke

Understand the nuke software and interface and node based advance compositing

Learning outcome: *Intro to Vfx compositing and CG compositing.*

Course: Applied Learning III - Advance Compositing
Course Credits: 4
120

Course Code:
Learning Hours:

Course Outcomes:

- CO1: How to speed up your professional workflow.
- CO2: Build amazing digital set extensions..
- CO3: How to insert shots into monitors and TV screens.
- CO4: Create a Sci-Fi holographic display.
- CO5: Add dust, smoke and texture to add realism.

Unit 1: Procedural Keying process.

Keying is the process of creating a matte.

Learning outcome: *Makes keying a lot faster than rotoscoping.*

Unit 2: Advanced 3D Camera tracking.

The *3D camera tracker* effect analyzes video sequences to extract *camera motion*

Learning outcome: Put a *3D camera tracker* effect on this layer.

Unit 3: Set extension using point cloud data and camera projection.

Present a visualization of the physical environment by placing *points* based a scene's depth *data*

Learning outcome: *we would learn to process data in 2D.*

Unit 4: Working with CG render passes - OpenEXR

Creating a *3D* scene with motion and camera shake from a *2D* image.

Learning outcome: Working with different *render passes* and bringing them back together.

Unit 5: Compositing for CG live action integration.

Integrate CG elements and live action footage seamlessly with these compositing techniques

Learning outcome: *CG elements into live action footage.*

Unit 6: Basic of stereoscopy.

Stereoscopic imaging, is a technique used to enable a three-dimensional effect, adding an illusion of depth to a flat image.

Learning outcome: *visual perception of differential distances among objects in one's line of sight.*

Unit 7: 2d to 3d stereo conversion using Depth map process.

Based on a depth gradient map, a depth level is assigned. Next, the depth map is assigned by cooperating with a cross bilateral filter to diminish the blocky artifacts

Learning outcome: *Work step by step through texturing.*

Unit 8: 2d to 3d stereo conversion using Rotomation process

This is an iterative *process* requiring adjustment of objects, shapes, depth, and visualization of intermediate results *in stereo*.

Learning outcome: *A process of making stereo images from non-stereo traditional.*

Unit 9: InPaint for stereo shot.

Erase unwanted objects with just a click. *Inpaint* does an incredible job of removing unwanted elements from your photos.

Learning outcome: *Remove any object from your video in a few brush strokes.*

Unit 10: Use of Furnace tool.

Furnace for Nuke is a sophisticated suite of 2D image processing (OFX) plug-ins, designed to enhance workflow and boost productivity for digital artists

Learning outcome: *Assists in lining up shots using Global Motion Estimation.*