Curriculum and Credit Framework
As per NEP 2020

For

B.Sc. Animation and Multimedia

(To be effective from the Academic Session 2024-25)

Department of Media Studies
Gurugram University, Gurugram
(A State Govt. University Established Under Haryana Act 17 of 2017)

Semester 4

Course Code	Course Title	Course ID	L (Hrs)	T (Hrs)	P (Hrs)	L Credits	T Credits	P Credits	Credits	MARKS TI	MARKS TE	MARKS PI	MARKS PE	MARKS Total
Core Course(s)														
CC-ID10	3D Character Rigging	240/ANI/CC401	2	0	4	2	0	2	4	15	35	15	35	100
CC-ID11	3D Character Animation	240/ANI/CC402	2	0	4	2	0	2	4	15	35	15	35	100
CC-ID12	Fundamentals of Match Move and 3D Compositing	240/ANI/CC403	2	0	4	2	0	2	4	15	35	15	35	100
Minor/ Vocational Course(s)														
MIC/VOC-4	One from Pool								4					100
Ability Enhancement Course(s)														
AEC-4	One from Pool								2					50
Value-added Course(s)														
VAC-3	One from Pool								**2**					**50**
Total Credits									**20**					**500**

240/ANI/CC401

B.Sc. Animation and Multimedia
SEMESTER – IV

Name of Subject: 3D Character Rigging	Maximum Theory marks: 50 (15+ 35)
Course ID: 240/ANI/CC401	Maximum Practical Marks: 50 (15+ 35)

Instructions for External Examiner: This question paper shall be divided in two sections. The examiner is requested to set section A as compulsory question containing 7 marks and from the entire syllabus (can be either objective or subjective). Section B will be in choice from two of the questions from each unit. The students will be required to attempt one question from each unit. All questions from each unit will carry equal marks.

Objectives: The objective of this course is to introduce students to the fundamental principles and techniques of 3D character rigging. Students will learn to create and manipulate character rigs using industry-standard software, focusing on both technical skills and creative problem-solving.

Course Outcomes:
By the end of this course, students will be able to:

- Understand and apply the principles of 3D character rigging.
- Use rigging software tools to create functional character rigs.
- Develop and refine character rigs for animation.
- Critically analyze and troubleshoot rigging issues based on feedback.

COURSE CONTENTS:

Unit 1: Introduction to 3D Character Rigging
1.1 Overview of character rigging and its importance in animation 1.2 Introduction to rigging software (e.g., Autodesk Maya, Blender) 1.3 Understanding the 3D workspace and rigging interface 1.4 Basic concepts: joints, bones, and hierarchies
Unit 2: Building a Basic Character Rig
2.1 Creating and placing joints and bones 2.2 Setting up IK (Inverse Kinematics) and FK (Forward Kinematics) systems 2.3 Skinning and weight painting

2.4 Basic control rigs for character movement
Unit 3: Advanced Rigging Techniques
3.1 Facial rigging and blend shapes 3.2 Creating custom rigging controls 3.3 Rigging for complex character movements (e.g., quadrupeds, wings) 3.4 Using scripts and expressions to enhance rigs
Unit 4: Rigging for Animation and Final Project
4.1 Preparing rigs for animation 4.2 Testing and refining rigs 4.3 Troubleshooting common rigging issues 4.4 Final project: creating a complete character rig

Suggested Readings:

- "Body Language: Advanced 3D Character Rigging" by Eric Allen and Kelly L. Murdock
- "Stop Staring: Facial Modeling and Animation Done Right" by Jason Osipa
- "Maya Character Creation: Modeling and Animation Controls" by Chris Maraffi
- "Rig it Right! Maya Animation Rigging Concepts" by Tina O'Hailey

240/ANI/CC402

B.Sc. Animation and Multimedia
SEMESTER – IV

Name of Subject: 3D Character Animation	Maximum Theory marks: 50 (15+ 35)
Course ID: 240/ANI/CC402	Maximum Practical Marks: 50 (15+ 35)

Instructions for External Examiner: This question paper shall be divided in two sections. The examiner is requested to set section A as compulsory question containing 7 marks and from the entire syllabus (can be either objective or subjective). Section B will be in choice from two of the questions from each unit. The students will be required to attempt one question from each unit. All questions from each unit will carry equal marks.

Objectives: The objective of this course is to introduce students to the fundamental principles and techniques of 3D character animation. Students will learn to animate characters using industry-standard software, focusing on both technical skills and creative expression.

Course Outcomes:
By the end of this course, students will be able to:

- **Understand and apply the principles of 3D character animation.**
- **Use animation software tools to create dynamic character animations.**
- **Develop and animate characters with realistic and expressive movements.**
- **Critically analyze and refine animated sequences based on feedback.**

COURSE CONTENTS:

Unit 1: Introduction to 3D Character Animation
1.1 Overview of 3D character animation and its applications 1.2 Introduction to animation software (e.g., Autodesk Maya, Blender) 1.3 Understanding the 3D workspace and animation interface 1.4 Basic animation concepts: keyframes, timelines, and interpolation
Unit 2: Principles of Animation
2.1 Fundamental principles of animation (e.g., squash and stretch, timing, anticipation, follow-through) 2.2 Creating believable motion: weight, balance, and inertia

2.3 Understanding pose-to-pose and straight-ahead animation techniques 2.4 Blocking and refining animation
Unit 3: Character Performance
3.1 Animating character walks, runs, and cycles 3.2 Facial animation and lip-sync techniques 3.3 Expressing emotions and personality through animation 3.4 Animating interactions between characters
Unit 4: Advanced Animation Techniques and Final Project
4.1 Advanced techniques: secondary motion, overlapping action, and 4.2 Exaggeration Techniques 4.3 Animation for different styles (realistic, cartoony, stylized) 4.4 Final project: creating a polished character animation

Suggested Readings:

- "The Animator's Survival Kit" by Richard Williams
- "Animation Mentor: Animation Tips and Tricks" by Shawn Kelly
- "Character Animation Crash Course!" by Eric Goldberg
- "The Illusion of Life: Disney Animation" by Frank Thomas and Ollie Johnston

240/ANI/CC403

B.Sc. Animation and Multimedia
SEMESTER – IV

Name of Subject: Fundamentals of Match Move and 3D Compositing	Maximum Theory marks: 50 (15+ 35)
Course ID: 240/ANI/CC403	Maximum Practical Marks: 50 (15+ 35)

Instructions for External Examiner: This question paper shall be divided in two sections. The examiner is requested to set section A as compulsory question containing 7 marks and from the entire syllabus (can be either objective or subjective). Section B will be in choice from two of the questions from each unit. The students will be required to attempt one question from each unit. All questions from each unit will carry equal marks.

Objectives: The objective of this course is to introduce students to the essential principles and techniques of match moving and 3D compositing. Students will learn to integrate 3D elements into live-action footage seamlessly using industry-standard software

Course Outcomes:
By the end of this course, students will be able to:

- Understand and apply the principles of match moving and 3D compositing.
- Use software tools to track and match move live-action footage.
- Integrate 3D models and animations into live-action scenes.

COURSE CONTENTS:

Unit 1: Introduction to Match Moving
1.1 Overview of match moving and its applications in visual effects 1.2 Introduction to match moving software (e.g., Mocha, Autodesk MatchMove) 1.3 Understanding the 3D workspace and match moving interface 1.4 Basic concepts: camera tracking, object tracking, and 3D solving
Unit 2: Camera Tracking Techniques
2.1 Preparing footage for tracking 2.2 2D and 3D camera tracking methods 2.3 Solving the camera motion

2.4 Refining and optimizing the camera solve
Unit 3: Introduction to 3D Compositing
3.1 Basics of compositing and its importance in visual effects 3.2 Introduction to compositing software (e.g., Adobe After Effects, Nuke) 3.3 Understanding layers, nodes, and the compositing interface 3.4 Integrating 3D elements with live-action footage
Unit 4: Advanced Techniques and Final Project
4.1 Advanced compositing techniques (e.g., rotoscoping, keying, color correction) 4.2 Working with multi-pass renders 4.3 Lighting and shadow integration for realistic compositing 4.4 Final project: creating a seamless match move and composite sequence

Suggested Readings:

- "Matchmoving: The Invisible Art of Camera Tracking" by Tim Dobbert
- "Digital Compositing for Film and Video" by Steve Wright
- "The Art and Science of Digital Compositing" by Ron Brinkmann
- "After Effects Compositing Cookbook" by Angie Taylor