

University of Mumbai




No. UG/ 09 of 2021

CIRCULAR:-

Attention of the Principals of the Affiliated Colleges, The Head of the University Department of Theatre Arts and Directors of the recognized Institutions in Faculty of Humanities.

They are hereby informed that the recommendations made by the Ad-hoc Board of Studies in **Theatre Arts** at its meeting held on 20th November, 2019 vide item No. **1(e)** and subsequently passed by the Board of Deans at its meeting held on 5th December, 2019 vide item No. **20** have been accepted by the Academic Council at its meeting held on 23rd February, 2021 vide item No. **4.8** and subsequently approved by the Management Council at its meeting held on 9th April, 2021 vide item No. **15** and that in accordance therewith, in exercise of the powers conferred upon the Management Council under Section 74(4) of the Maharashtra Public Universities Act, 2016 (Mah. Act No. VI of 2017) the Ordinance **6530 & 6531** Regulations **9276 & 9277** and the syllabus of **Diploma in Animation, VFX & Gaming (DIAVG)** has been introduced and the same have been brought into force with effect from the academic year **2020-21**. (The said course might be introduced from the academic year 2021-2022 in the wake of prolonged Covid-19 pandemic situation in the country) accordingly. (The same is available on the University's website www.mu.ac.in).

MUMBAI - 400 032
1st June, 2021
To ,


(Dr. B.N. Gaikwad)
I/c. REGISTRAR

The Principals of the Affiliated Colleges, The Head of the University Department of Theatre Arts and Directors of the recognized Institutions in Faculty of Humanities. (Circular No. UG/334 of 2017-18 dated 9th January, 2018.)

A.C/4.8/23/02/2021
M.C/15/9/04/2021

No. UG/ 09-^A of 2021

MUMBAI-400 032

1st June, 2021

Copy forwarded with Compliments for information to:-

- 1) The Chairman, Board of Deans
- 2) The Dean Faculty of Humanities,
- 3) The Chairman, Ad-hoc Board of Studies in Theatre Arts,
- 4) The Director, Board of Examinations and Evaluation,
- 5) The Director, Board of Students Development,
- 6) The Co-ordinator, University Computerization Centre,


(Dr. B.N. Gaikwad)
I/c. REGISTRAR

Copy to :-

- 1. The Deputy Registrar, Academic Authorities Meetings and Services (AAMS),**
- 2. The Deputy Registrar, College Affiliations & Development Department (CAD),**
- 3. The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Department (AEM),**
- 4. The Deputy Registrar, Research Administration & Promotion Cell (RAPC),**
- 5. The Deputy Registrar, Executive Authorities Section (EA),**
- 6. The Deputy Registrar, PRO, Fort, (Publication Section),**
- 7. The Deputy Registrar, (Special Cell),**
- 8. The Deputy Registrar, Fort/ Vidyanagari Administration Department (FAD) (VAD), Record Section,**
- 9. The Director, Institute of Distance and Open Learning (IDOL Admin), Vidyanagari,**

They are requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to in the above circular and that on separate Action Taken Report will be sent in this connection.

- 1. P.A to Hon'ble Vice-Chancellor,**
- 2. P.A Pro-Vice-Chancellor,**
- 3. P.A to Registrar,**
- 4. All Deans of all Faculties,**
- 5. P.A to Finance & Account Officers, (F.& A.O),**
- 6. P.A to Director, Board of Examinations and Evaluation,**
- 7. P.A to Director, Innovation, Incubation and Linkages,**
- 8. P.A to Director, Board of Lifelong Learning and Extension (BLLE),**
- 9. The Director, Dept. of Information and Communication Technology (DICT) (CCF & UCC), Vidyanagari,**
- 10. The Director of Board of Student Development,**
- 11. The Director, Department of Students Welfare (DSD),**
- 12. All Deputy Registrar, Examination House,**
- 13. The Deputy Registrars, Finance & Accounts Section,**
- 14. The Assistant Registrar, Administrative sub-Campus Thane,**
- 15. The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan,**
- 16. The Assistant Registrar, Ratnagiri sub-centre, Ratnagiri,**
- 17. The Assistant Registrar, Constituent Colleges Unit,**
- 18. BUCTU,**
- 19. The Receptionist,**
- 20. The Telephone Operator,**
- 21. The Secretary MUASA**

for information.

**New Ordinances 6530 & 6531 relating to
the Diploma in Animation, VFX & Gaming**

1. Necessity of starting Diploma in Animation, VFX & Gaming (DIAVG) course:

India has witnessed the emergence of various new-age courses that are gathering momentum, as students increasingly pursue courses that fuel their passion and open up job opportunities. A recent demand for educated and qualified professionals was discovered in the field of Animation, VFX & Gaming Industry. Even the world is looking closely at Indian Film Makers for Movies, Newsreels, Commercials, Music videos, Documentaries, etc. leading to rising employment opportunities for professionals. Further to highlight that due to the extensive presence of the Film, Entertainment & Gaming industry in Mumbai, it's been considered as capital for it, making it a preferred destination for professional education in this sector. University of Mumbai by offering structured course for this Industry shall open up opportunities for multiple aspiring students to pursue their career in this rising sector.

2. Whether UGC has recommended to start the said Course:

The basis to start the course is our indigenous understanding about its requirement and not primarily as per the recommendation from UGC.

3. Whether the course have commenced from the academic year 2019-20:

Diploma in Animation, VFX & Gaming (DIAVG) course is now planned to start from next academic year 2021-22.

4. The courses started by University are Self-Financed, whether adequate number of eligible permanent Faculties are available:

Diploma in Animation, VFX & Gaming (DIAVG) course is planned to start from the academic year 2021-22 and the identification and appointment of Eligible Faculties is under progress.

5. To give details regarding duration Diploma in Animation, VFX & Gaming (DIAVG) course and is it possible to compress the Course:

The duration of the Course is for 1 year which is taken-up after considering the optimal duration needed to complete the syllabus requirement of the course.

6. The intake capacity of Diploma in Animation, VFX & Gaming (DIAVG) course and no. of admissions given in the current academic year (2019-20):

The course is to start from the academic year 2021-22 and hence admissions has still not started. The Intake of this course is 60 students.

7. Opportunities of Employability / Employment available after undertaking Diploma in Animation, VFX & Gaming (DIAVG) course:

The training methodology of the course has a high emphasis on the industry oriented approach. Students are to be part of live projects, internships and other extracurricular activities with the Industry during their educational journey to ensure their industry readiness. Along with the collaborations and associations with key industry practitioners, a dedicated placement cell will facilitate different forms of employment opportunities for the students. In the growth of the Film and Entertainment industry in India, Mumbai city has played a significant role in the past century. It houses many of the leading corporates, production houses and organisations of this Industry, opening the untapped employment opportunities for learned professionals, undertaking such courses recognised by the University of Mumbai department.

Diploma In Animation, VFX & Gaming



<u>O.6530</u>	Title of the Course	Diploma In Animation, VFX & Gaming
<u>O.6531</u>	Eligibility for Admission	Have passed 10+2 / HSC examinations from any stream
<u>R.9276</u>	Passing Marks	40% passing marks
	Ordinances / Regulations (if any)	As attached
	No. of Years / Semesters	1 years full time/ 2 semesters
	Level	Diploma
	Pattern	Semester
	Status	New
	To be implemented from Academic Year	From academic year 2020-21
<u>R.9277</u>	Intake Capacity	60

Objectives of Diploma In Animation, VFX & Gaming

The course is a practical course designed to give the best technical training using the latest, state-of-the-art technology. Students will develop a strong foundation in design applicable to various areas of computer graphics content creation including animation, filming, post production, and asset development.

Course Objective

This course will enable students to:

- learn how to create a short animated film with a 3D character.
- develop their skills in 3D modelling, texturing, rigging, animation, lighting, using cameras, rendering and compositing and other technicalities.
- concept, model and animate character, design game levels, create high-detail creatures, build realistic environments and craft a short animated movie.
- learn advanced high polygon modelling, realistic lighting, texturing and advanced realistic character animation.
- showcase their creativity and build their technical knowledge in order to maximise their artwork within fun and engaging game environments.
- develop skills in organisation, time and project management.

R – Passing Standard

The learners to pass a course shall have to obtain a minimum of 40% marks in aggregate for each course where the course consists of Internal Assessment & Semester End Examination. The learners shall obtain minimum of 40% marks (i.e. 24 out of 60) in the Internal Assessment and 40% marks in Semester End Examination (i.e. 16 Out of 40) separately. A learner will be said to have passed the course if the learner passes the Internal Assessment & Semester End Examination together.

Marks	Grade Points	Grade	Performance
Less than 40	0	F	Fail
40 - 44.99	4	D	Pass
45 - 49.99	5	C	Average
50 - 54.99	6	B	Above Average
55 - 59.99	7	B+	Good
60 - 69.99	8	A	Very Good
70 - 79.99	9	A+	Excellent
80 & Above	10	O	Outstanding

R - Credit Based Evaluation System Scheme of Examination

For all semesters, the performance of the learners shall be evaluated into two components. The first component shall carry 40% marks which will be an internal assessment while the second component shall carry 60% marks at semester end examination.

The allocation of marks for the Internal Assessment 40% and Semester End Examinations 60% are as shown below:

a) **Structure of Internal Assessment - 60% = 60 marks**

Sr. No.	Particulars	Marks
1	One periodical class test held in the given semester	20 Marks
2	Subject specific Term Work Module/assessment modes – atleast two as decided by the department in the beginning of the semester (like Extension/field/experimental work, Short Quiz; Objective test, open book test etc and written assignments, Case study, Projects, Posters and exhibits etc for which the assessment is to be based on class presentations wherever applicable) to be selflessly assessed by the teacher/s concerned	30 Marks
3	Active participation in routine class instructional deliveries (and in practical work, tutorial, field work etc as the case may be)	05 Marks
4	Overall conduct as a responsible learner, mannerism and articulation and exhibit of leadership qualities in organizing related academic activities	05 Marks

b) **Semester End Examinations - 40% = 40 Marks**

- i. Duration – These examinations shall be of 2 Hours duration.
- ii. Theory Question Paper Pattern:
 - Q1 - Answer in Brief (Any 5 out of 7) - 15 marks
 - Q2 - Answer in detail (Any 3 out of 5) - 15 marks
 - Q3 - Descriptive question/case study (Compulsory) - 8 marks

Question may be subdivided into sub-questions a, b, c... and the allocation of marks depends on the weight-age of the topic.

Course Structure

	<u>DIPLOMA IN Animation, Vfx & Gaming</u>	<u>Credits</u>	<u>Internals</u>	<u>Externals</u>	<u>Total</u>
	SEMESTER I				
1.1	Production & Post-Production Process	4	60	40	100
1.2	Elements of Animation	4	60	40	100
1.3	Modeling & Texturing	4	60	40	100
1.4	Lighting	4	60	40	100
1.5	Practical Training & Project Report I	4	100	-	100
	TOTAL	20	340	160	500
	SEMESTER II				
2.1	3D Interactive Basics & Game Environment	4	60	40	100
2.2	Editing & Compositing	4	60	40	100
2.3	3D Fx	4	60	40	100
2.4	Graphics, Animation & Direction for Editors	4	60	40	100
2.5	Practical Training & Project Report II	4	100	-	100
	TOTAL	20	340	160	500

1.1 PRODUCTION & POST PRODUCTION PROCESS

UNIT : I

Basic requirements of Television Camera - Lens - Turret - Variable Focal Length Lens -Lens Controls - Focus ring - Zoom ring - Aperture ring - Macro ring - Flange Focus -Filter Wheel - Image sensor - Camera Tube - CCD - Signal Processing - Analogue and Digital Video signal - -Composite and Component Video signal - White and Black Balance - Saturation and Pedestal Control - Gain Control - Menu Controls - Camera Supports.

UNIT : II

Sound Recording Techniques for Television - Understanding Sound - Frequency - Sound Reproduction - Microphone - Functioning of Microphone - Types of Microphone and their Application - Audio Mixing Console - Audio Sources - Analogue and Digital Audio Recording Instruments - Audio Sweetening Techniques - Audio layering - Mixing -audio Monitoring Devices - Acoustic Treatment for Recording Studio -

UNIT : III

Hard wares in Television - Camera and its Accessories - Camera Supports - Camera Control Unit -Vision Mixer - Special Effects Generator - Digital Video Effects Generator - Character Generator - Video Monitors - Intercommunication System - audio Monitor - Audio Mixing Console - Lighting control - Lighting Instruments - Video Tape Recorders -Telecine - Sync Generators - Teleprompters - Graphic Generators - Video Editing Systems - Linear and Non-Linear Video Editing Systems - Effective use of Hardware in Television Production - Co-ordination.

UNIT : IV

Television Programme Production - Planning - Selection of Concept -Scripting - Story board writing - Writing Shooting Script - Budgeting - Selection of Artist - Selection of Location - Production arrangements - Floor Plan - Set-designing and Construction of Sets - Lighting Plan - Placement of of Set-props - Rehearsal - Blocking - Preparing Camera card, Audio cue-sheet, VTR and Telecine cue-sheet - Preparation of Graphics -Dry Run-Recording - Television Programme Production Crew - Technical and Production Personnels - Duties and Responsibilities.

UNIT : V

Post Production Techniques - Video Editing - Linear and Non-Linear Editing - Cut to Cut Editing -A/B Roll Editing - Use of Special Video Effects Generator - Using Computers In Video Editing - Different Non -Linear Editing Software - Audio / Video Capture cards - Digitizing Techniques - Using compression during Capturing -Colour Correction - Technique of Non-Linear Editing - Using Videos/Audio layers - Use of Transition and Effects - Compositing - Modifying images - Editing and Exporting to MTape - Voice Dubbing - Effects Posting - Music Recording - Audio Layering - Mixing Techniques - Understanding Time-code-Time-code based Editing - Creating EDL - Off-line Editing.

REFERENCE:

1. The Complete Film Production Handbook- Honthaner, Eve Light
2. Video Production – Belavadi -Oxford

1.2 ELEMENTS OF ANIMATION

UNIT - I

Animation Tools - Introduction to Animation - History of Animation - Production Pipeline - Types of Animation - Different Animation types - Animation Tools - Principles - Graph Editor - Animation types

UNIT - II

Ball Bounce Animation - Set Key Animation - Stretch & Squash Animation - Fine Tuning in Graph Editor - Obstacle Ball Bounce Animation - Set Key - Primary Animation - Stretch & Squash - Obstacle Bounce - Fine Tuning - Graph Editor

UNIT - III

Walk Cycle & Progressive Walk Animation (Cartoon Character Animation) - Understanding Walk Animation - Normal Walk - Cartoonic Walk Styles - Acting - Blocking - Primary - Secondary - Fine Tuning - Graph Editor - Previewing Animation

UNIT - IV

Run Cycle Animation & Progressive Run Animation (Cartoon Character Animation) - Normal Run - Cartoonic Run Styles - Acting - Blocking - Primary Animation - Secondary Animation - Fine Tuning - Graph Editor - Previewing Animation

UNIT - V

Jump & Dive Animation (Cartoon Character Animation), Facial Animation (Cartoon Character Animation), Car Animation (Cartoon Car Animation) - Understanding Facial Expressions - Acting - Keying - Fine Tuning - Graph Editor - Inorganic Animation

REFERENCE

1. Animation The Mechanics of Motion - Chris Webster
2. Understanding Animation - Paul Wells
3. Timing for Animation - Harold Whitaker, John Halas
4. The Art of 3-D Computer Animation and Effects, Third Edition - Isaac Victor Kerlow

1.3 MODELING & TEXTURING

UNIT - I

Introduction to Maya: What is 3D- Coordinates- Application of 3dMaya Interface- the three dimensions- Maya workspace - The axis indicator - Maya scene view

UNIT - II

Nurbs Modeling - Intro to curves- types of curves available in maya - EP curve & CV curve - its differentiation, how to edit its positions- foundation of Nurbs - Curves - Proficiency at drawing and editing curves-nurbs surface creation,- Edit Nurbs options, Different objects created using curve

UNIT III

Polygon Modeling –Objects - Different objects created using polygon tools, tips and tricks

UNIT - IV

Application & difference between 2d, 3d textures & Environmental textures, Maya 2D textures - categories: water, Perlin, noise, etc., Bitmaps- generating textures - Maya 3D textures – procedure & resolutions – mathematics & algorithms.

UNIT - V

Basic utilities for texturing - general utilities- color utilities, render node utilities, switch utilities, tweaking output -Generating texture without editing attributes- double side texturing- mixing 3 or more colors & taking output.

REFERENCE

1. Stop Staring: Facial Modeling and Animation Done Right - Jason Osipa
2. Texturing and Modeling : A Procedural Approach - David S. Ebert, F

1.4 LIGHTING

UNIT - I

What is light & its theory, Maya lights, attributes & shadows. Maya spot lights - on stage - in motion pictures- Directional lights- Ambient lights - Point lights - Area lights – application, characteristics, properties and palettes for the above

UNIT - II

3-point lighting concepts, Three-point lighting in visual media such as video, film, still photography and computer-generated imagery- effective use of key light- fill light - back light

UNIT - III

Working with Global Illumination, Final Gather, and Caustics- Global Illumination in mental ray simulation - photons and their applications, Final Gathering - Caustics phenomena reflection and refraction through transparent surfaces.

UNIT - IV

Advanced Techniques (Physical sun & sky, HDRI) & Generating various passes (ambient, occlusion, diffuse, etc.,) HDRI - Definition & its applications

UNIT - V

What are cameras- How to use different types of cameras available in maya - Camera & Aim- Zoom, Pan, focus – lenses and filters – effective blocking techniques- Maintaining shot continuity

REFERENCE

1. Advanced Maya Texturing and Lighting with CDROM - Lee Lanier, Wiley Publishing
2. Texturing and Modeling : A Procedural Approach - David S. Ebert, F Rendering with Mental Ray -Thomas Driemeyer
3. Essential CG Lighting Techniques - Darren Brooker

2.1 3D INTERACTIVE BASICS& GAME ENVIRONMENT

UNIT - I

Introduction about 3d interactive world and its application, Introduction to Game engine and features, virtools its features and improvements, basics of virtools, exporting from maya to virtools, exporting an animated character inside virtools

UNIT – II

Game Tool interface - Menu Bar - 3d layout panel-tool bar-selection and transformation control- camera manipulation controls-preview panel- building blocks panel-building blocks, virtools resources, level manager panel-level manager, status bar

UNIT – III

Naming Conventions and Best Practice Concepts- virtools naming conventions-importing from maya-3d model data- resetting the models transform-exporting materials-exporting lights-exporting cameras- exporting dummy objects-exporting curves-exporting groups-exporting bone setup

UNIT IV

Data resources and Initial conditions-loading a data resources-loading an object and adjusting its properties, placing a set inside the stage

UNIT V

Object transformation-rotation scaling-adding a movement script to 3d entity-simple object rotation-advanced object rotation- revolving one object around another-object scaling-making an object move along a path controlling an object using the keyboard

REFERENCE

1. Building Interactive Worlds in 3D: Virtual Sets and Pre-visualization for Games, Film & the Web - Jean-Marc Gauthier
2. The Technique of Film and Video Editing, Fourth Edition: History, Theory, and Practice - Ken Dancyger

2.2 EDITING & COMPOSITING

UNIT - I

Introduction - 3D Editing - What is 3D editing - Principles of editing - Basic understanding about storyboard - integrating story board to editing - Basic tools - work in timeline editing - Animatics Editing - Rendering frames - adding frames markers - separating into shots order

UNIT - II

Introduction To Audio Editing - Syncing audio to video Drawing information - making rhythmic - audio cutting - Fine tuning audio-Playblast editing - 3D output animation -

UNIT - III

Introduction - Compositing Fundamentals - Interface - Knowledge about compositing - Analysing reference composited works - Rotoscopy - Keying – Wire removal - Extracting image from the background - add grains for the final management - color grading

UNIT - IV

Color correction - Motion Tracking - Stabilization - matching colors between two shots - parenting layers-Titling Effects - Motion Graphics - keyframe animation - television advertisements - using 3d camera - null object - filters

UNIT - V

3D Compositing - Fixing 3D object with live footage - understanding different types of passes - fixing layer passes - Fine tuning image composition - z depth

REFERENCE

1. The Technique of Film and Video Editing, Fourth Edition: History, Theory, and Practice - Ken Dancyger
2. Art & Science of Digital Compositing - Ron brinkmann

2.3 3D FX

UNIT - I

Introduction to Dynamics -Tools & Techniques.Dynamics and rules of physics to simulate natural forces- Dynamics and realistic motion - Dynamics Vs traditional keyframe animation.

UNIT - II

Fields, Particles, Emitter- use of fields to animate the motion of particles- Particles- Cloth- soft bodies- rigid bodies- fluids and hair- motion of natural forces with dynamic fields.

UNIT - III

Soft & Rigid Bodies & its nature- polygonal surface- NURBS surface- NURBS curve- lattice, wire, or wrap deformer - Rigid body- creating a field on an object or as a stand-alone force.

UNIT - IV

Dynamics – Particles- Maya Nucleus technology- Maya Nucleus solver – providing fast simulation results- dynamic simulation framework for generating Cloth simulations.

UNIT - V

Cloth Simulation, Fur Simulation- Maya's cloth module- creating realistic and stylized animated cloth for characters, creatures- Using Maya Fur- creating realistic, self-shadowing fur and short hair on multi-surface NURBS- polygonal and subdivision surface models.

REFERENCE

1. Maya Studio Projects: Dynamics - Todd Palaman
2. The Technique of Film and Video Editing, Fourth Edition: History, Theory, and Practice - Ken Dancyge

2.4 GRAPHICS, ANIMATION AND DIRECTION FOR EDITORS

UNIT - I

Construction of Cinemaproduction - Theme - Synopsis - Online Treatment - Screenplay - Dialogue - Master scene script - Shooting Script - Characterization - Make up - Stage Direction for Various dialogues and movements - Master scene and Triple take Techniques.

UNIT - II

Break up into shots based on acting - Different film genres - Economic and Operative Break down schedule and shooting schedule - Dope Sheets - Budgeting - Directing the Actor and crew.

Reference Books:

- 1.How to read a Film - James Monaco.
- 2.Directing-Film Techniques and aesthetics - Michael Rabiger.
- 3.Five C's of Cinematography - Josheph V. Mascelli.
- 4.Screenplay writing - Eugen vale.
- 5.The Art of Dramatic Writing - LajosEgri.
- 6.Technique of Film make-up - Vincent ANIMATION

UNIT - III

Traditional animation - Stop animation - 2D animation - 3D animation - Draw on film animation and chromo key programming - Usage of virtual set technology.

UNIT - IV

Compositing - Typical application - Physical compositing - Multiple exposure - Back ground projection.

UNIT - V

Latest technique in animation - Effects matte painting - Morphing - Optical effects - Prosthetic make up effects. Rotoscoping - Traveling matte dolly - Virtual cinematography - Wire removal scan mate adobe after effects.

REFERENCE:

3. Creating Motion Graphics with After Effects, Fourth Edition By Chris Meyer and Trish Meyer
4. VFX Artistry by Spencer Drate and Judith Salavetz
5. The Visual Effects Arsenal by Bill Byrne
6. The Visual Effects Arsenal by Bill Byrne

Practical Training & Project Report

Students will undertake a substantial piece of independent work, which demonstrates an area of interest or specialism. Students will be given guidance throughout the academic year in order to help the student maintain sufficient progress to complete the project successfully.

