

MANGALORE UNIVERSITY



National Education Policy – 2020 [NEP-2020]

Curriculum Structure:
**B.Sc. Animation and Visual Effects Degree Syllabus for III
and IV semesters
And
Open Elective Courses**

CURRICULUM FOR BSc - ANIMATION AND VISUAL EFFECTS

Semester 1	DSC	Credits	Paper Title
	DSC-1	3+2	Fundamentals of Drawing
	DSC-2	3+2	Traditional and Stop Motion Animation
	DSC-3	3	History of Animation
	OE 1	3	Basics of Graphic Design
Semester 2	DSC	Credits	Paper Title
	DSC-4	3+2	Storyboard and Advanced Drawing
	DSC-5	3+2	2D Digital Animation
	DSC-6	3	Production Design of Animation
	OE-2	3	Advances in Graphic Design
Semester 3	DSC	Credits	Paper Title
	DSC-7	3+2	3D Modeling
	DSC-8	3+2	Rigging & Animation
	DSC-9	3	CGI Production
	OE -3	3	Photography
Semester 4	DSC	Credits	Paper Title
	DSC- 10	3+2	Audio Production
	DSC-11	3+2	Surfacing & Lighting
	DSC-12	3	Aesthetics of Video Editing
	OE-4	3	Editing
Semester 5	DSC	Credits	Paper Title
	DSC-13	3+2	Video Compositing
	DSC-14	3+2	Dynamics
	DSC-15	3	Digital Compositing
	DSC E -1	3	Ad Film Making
	Vocational-1	3	Advanced CGI-I
Semester 6	DSC	Credits	Paper Title
	DSC-16	3+2	Project Management
	DSC-17	3+2	Advanced Video Compositing
	DSC-18	3	Advanced Animation
	DSC E -2	3	Stereoscopic & Match Moving
	Vocational -2	3	Advanced CGI-II
	Internship	2	Report/ Dissertation
Semester 7	DSC	Credits	Paper Title
	DSC-19	3+2	Advanced Modeling
	DSC-20	3+2	Advanced Lighting and Rendering
	DSC-21	3	Introduction to Electronic Media
	DSC E -3	3	Film Production Management
	Vocational -3	3	Digital Cinematography
	Research Methodology	3	
Semester 8	DSC	Credits	Paper Title
	DSC-22	3	Creative Business Management
	DSC-23	3	Media Ethics and Copyright Law
	DSC-24	3	Visual Communication
	DSC E -4	3	Case study on Animation film production
	Vocational -4	3	Animation Promotion and Merchandising
	Research Project	6	

Curriculum Structure

Program: B.Sc. (Basic and Honors)

Subject: Animation & Visual Effects

Sem.	Discipline Specific Core Courses (DSC)	Hours/Week		Discipline Specific Elective Courses (DSE)/ Vocational Courses (VC)	Hours/Week
		Theory	Lab		
1	DSC-1: Fundamentals of Art DSC-1 Lab: Principles of Art, Colour Theory, Figure Drawing and Perspective Drawing	3	4		
1	DSC-2: Traditional and Stop Motion Animation DSC-2 Lab: Animation Principles, Cel Animation, Clay Sculpting, Stop Motion animation	3	4		
1	DSC-3: History of Animation	3			
1	OE-1: Basics of Graphic Design	3			
2	DSC-4: Storyboard and Advanced Drawing DSC-4: Lab: Layout, Storyboard, Comic strip, Gesture Drawing, Figure drawing, Cartoon Character	3	4		
2	DSC-5: 2D Digital Animation DSC-5: Lab: Key Frames, X-Sheet, Walk cycle, Run Cycle, Jump, Expressions, Logo Animation.	3	4		
2	DSC-6: Production and Design of Animation	3			
2	OE-2: Advances in Graphic Design	3			

THIRD SEMESTER

Course Code: DSC-7	Paper Title: 3D Modeling
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 40	Formative Assessment Marks: 40
Summative Assessment Marks: 60	Exam Duration: 2 Hours

Course Contents

Contents	Hours
Unit - 1	
Introduction to modeling, Basics of 3D modeling, Key Elements of 3D Modeling, Advantages, Challenges, Enhanced Animation through 3D modeling Applications of 3D modeling in the real-world.	10
Unit - 2	
Introduction to Maya's interface. Primitive shapes in Maya. Primitive tools. Surface points. Polygon modeling, Introduction to Polygon Tools, Vertices. Edges, Uvs, Face. Extrude. Boolean. Poly Count. Line Flow. Topology. Channel Box. Attribute Editor.	10
Unit - 3	
Key developments in the history of animation and 3D modeling. Role technology played in enhancing 3D modeling techniques, Applications of 3D modeling. Articulation to Social Change Corresponding with Technological Developments in 3D Modeling.	10
Unit - 4	
Using the Show manipulator tool to influence and control extrusion, Other hybrid tools (bevel, wedge, cut faces, etc). Building sample model from blueprint or technical reference, Demonstrate proper attribution and appropriate sources. Emerging technology in 3D modeling.	10

Reference Books:

1. Dariush Derakhshani, Introducing Maya 2017, Sybex, 2016.
2. Kenny Cooper, Jim Lammers, Advanced Maya: Character modelling, Trinity Animation, Inc. 2003.
3. Chris Maraffi, Maya Character Creations: Modeling and animation controls, New Riders; 1 Edition, 2003.
4. Maya Hyper- Realistic Creature creating: A hands on introduction to key tools and techniques in Autodesk Maya, Paul Thuriot, Jeff Unay , 2008, Autodesk Maya Press, Erick Miller,

Course Code: DSC-7 Lab	Paper Title: 3D Modeling Lab
Course Credits: 2	Hours of Teaching/Week: 4
Total Contact Hours: 52	Formative Assessment Marks: 25
Summative Assessment Marks: 25	Exam Duration: 2 Hours

Practice Lab

The following activities shall be carried out in the lab

3D Modeling

- Introduction and Interface to Maya
- NURBS Modeling- Learning NURBS tool
- NURBS Prop Modeling
- NURBS Organic modeling
- Learning Sub-division Tool
- Modeling using Sub-division
- Learning Polygon tools
- Creating interior Modeling
- Creating Exterior Modeling
- Polygon Prop Modeling
- Polygon Organic Modeling
- Creating Female Anatomy
- Creating Male Anatomy
- Advanced Animal Modeling
- Advanced Creature Modeling

Course Code: DSC-8	Paper Title: Rigging & Animation
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 40	Formative Assessment Marks: 40
Summative Assessment Marks: 60	Exam Duration: 2 Hours

Course Contents

Contents	Hours
Unit - 1	
Introduction to Rigging. Understanding Character Movements and Kinematics. Types Of Rigging. Predicting the Needs of a Character Rig based on Story Necessity. Planning Joint Arrangement for Pure FK, IK, Spline IK, Dynamic Musculature, and other Specialized Character Needs. Rigging In 2D Digital Animation and 3D Animation.	10
Unit - 2	
Principles of Animation: Squash and Stretch, Anticipation, Staging, Straight Ahead and Pose to Pose, Follow Through and Overlapping Action, Slow In And Slow Out, Arc, Secondary Action, Timing, Exaggeration, Solid Drawing, Appeal. Posing In Animation.	10
Unit - 3	
Nonlinear Animation: Introduction to Nonlinear Animation and Understanding Trax editor and Creating Poses and working with Poses - Creating Clips and working with Clips and Modifying Clips ñ Blending clips	10
Unit - 4	
Line of Action. Application of I, C and S curve in animation. Static and Dynamic poses. Blocking in animation. Application of key pose. Extreme, Breakdowns and in-betweens. Application of timing in animation. Application of gestures in animation. Expressions in animation. Lip sync.	10

Reference Books:

1. Dariush Derakhshani, Introducing Maya 2017, Sybex, 2016.
2. Richard Williams, Animation Survival Kit, Revised edition, 2009.

Course Code: DSC-8 Lab	Paper Title: Rigging & Animation Lab
Course Credits: 2	Hours of Teaching/Week: 4
Total Contact Hours: 52	Formative Assessment Marks: 25
Summative Assessment Marks: 25	Exam Duration: 2 Hours

Practice Lab

The following activities be carried out in the lab.

Rigging

- Use of Set Driven Key
- Parenting and Grouping.
- Constraints. Deformers.
- Concept of IK and FK
- Designing of joints for biped characters
- Application of Global control
- Prop and mechanical rigging
- character rigging
- Function of skinning
- Paint weight

Animation

- Keyframe Animation
- The Graph Editor
- Motion Path animation
- Use of Animation Layers
- Create Poses for Animation
- Walk Cycle animation (Two Legged)
- Run Cycle animation (Two Legged)
- Character Animation
- Self-Enactment for animation

References:

1. Carlo Sansonetti, Character rigging: The Puppet Rig Maya Rigging Techniques, 2007
2. Richard Williams, Animation Survival Kit, Revised edition 2009.

Course Code: DSC-9	Paper Title: CGI Production
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 40	Formative Assessment Marks: 40
Summative Assessment Marks: 60	Exam Duration: 2 Hours

Course Contents

Contents	Hours
Unit - 1	
Conventional Animation, General Computer Animation, Introduction to various 3D modelling, Split polygon faces, Edge & bevel, NURBS, sub-D, -Extruding in 3D, Camera Movements, Lighting, Poly editing techniques	10
Unit - 2	
2D sketches reference for 3D model, Image Planes, Sculpting in 3D Model, Polygon Primitives, Low Poly/High Poly modelling, Tris and nGons, Model symmetry, Drawing a Polygon	10
Unit - 3	
Key Framing in Maya , Articulated Figure Animation, Character Animation, Facial Animation, Motion Capture, Introduction to texturing, Introduction to Maya-Hyper-shade Baking maps, Unwrapping UV mesh,	10
Unit - 4	
Dynamics of Animation, Setting Light Parameters in Maya, Rendering Tool, Network Rendering, Robotics for Animation. Particles in 3D , Designing 3D Lighting, Fluids	10

Reference Books:

1. Catmull, E., "The Problems of Computer-Assisted Animation," SIGGRAPH'78, Pp. 348-353.
2. Leonard Maltin, "Of Mice And Magic - A History Of American Animated Cartoons," Penguin Books, New York, 1987.
3. The Illusion Of Life: Disney Animation By Frank Thomas, Ollie Johnston, ISBN: 8131502546,
4. Introduction To 3D Graphics and Animation Using Maya, Adam Watkins, International Thomson Computer Pres, 2007, ISBN: 0764123998,
5. Complete Animation Course, Chris Patmore, Barrons Educational Series Inc, 2003.
6. Maya: A Professional Guide, Adam Watkins, Dreamtech, First Edition- 2003.

Course Code: OE-3	Paper Title: Photography
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 40	Formative Assessment Marks: 40
Summative Assessment Marks: 60	Exam Duration: 2 Hours

Course Contents

Contents	Hours
Unit - 1	
Principal parts of Photographic cameras: (a) Lens (b) Aperture (c) Shutters, Various types and their functions, Focal plane shutter and in-between the lens shutter, shutter synchronization, Self-timer.	10
Unit - 2	
Prism and Light Spectrum – VIBGYOR – Speed of Light – Reflection –Refraction, Human Eye and Camera Lens – Comparisons and differences –Work of Muybridge and Edison – Eastman – Bioscope, Forced Perspective – Hyper focal Distance - Fore Shortening, Lens Aberrations – Spherical, Optical, Astigmatism Inner reflection –Chromatic aberrations – Corrections – Lens elements and Lens Bar	10
Unit - 3	
Pinhole Camera – Camera Obscura – SLR – TLR – Parallelax Error. Celluloid Camera, Electronic Camera, Lens-Normal Lens – Wide Angle Lens – Telephoto Lens – Fixed Focus Lenses – Image formation –Analog to Digital – Block Lenses and Focus Points – Depth of Field and Depth of Focus – Deep Focus Lenses – Variable Focus Lens – Merits and Demerits – Lens and Perspectives – 3 D Lenses.	10
Unit - 4	
White balance - Principles of Photography: Rules of framing. Rule of third - Other important rules related to photography, Photography Genres – Lighting - Ad photography - Tips for becoming a Professional photographer / Ethics of photography	10

Reference Books:

1. Steve Bavister, Digital Photography & Journalism, Collin's & Brown Ltd, 2000.
2. John Hedgecoe, Basic Photography, Collin's on Brown Ltd., 2000.
3. Vladimir Nilsen, Cinema As A Graphic Art, Penguin publisher, 2007
4. Eric De Mare, Photography - Penguin publisher, 2012

FOURTH SEMESTER

Course Code: DSC-10	Paper Title: Audio Production
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 40	Formative Assessment Marks: 40
Summative Assessment Marks: 60	Exam Duration: 2 Hours

Course Contents

Contents	Hours
Unit - 1	
Sound Basics, Characteristics of Waves, Hearing, Perception of Sound direction, Recording – Introduction, Microphone & Speaker Mechanism, Microphone & Placement techniques, Recording techniques, Stereo recording techniques, Setups and Equipment, Computer Based Recording, Tempo, Harmony and Beats.	10
Unit - 2	
Introduction to Audio software's, Software Interface, Settings and Preferences, Recording through audio software, Processing in audio software, introduction to spectrogram – horizontal and vertical spectrogram, Signal Reconstruction, Noise Cancelling, Audio Filters.	10
Unit - 3	
Introduction to Seven essential Acting concepts, The Audience, The Character, The Scene, Movement, Speech, the Camera, The Technique, The Form, The Medium, Classroom and an acting analysis, Audio Identification, Audio Matching, Audio Alignment, Audio Panning.	10
Unit - 4	
Audio Representation, Wave and Wave Forms, Frequency and Pitch, Dynamics Intensity and Loudness, Timbre, Midi Representation, Analog Signal, Digital Signal, Time Rapping, Music Synchronization, Audio Thumb Nailing, Audio Precision, Recall, F-Measure.	10

Reference Books:

1. Rhonda L. Blair, "Acting: The first six Lessons", Routledge Publications, 2010, 2nd Edition.
2. Tomlinson Holman, "Sound for film and television, Volume 1", Focal Press Publications, 2002, 2nd Illustrated Edition.
3. John Purcell, "Dialogue Editing for motion picture: a guide to the invisible art", Elsevier Publications, 2007, Illustrated Edition.

Course Code: DSC-10 Lab	Paper Title: Audio Production Lab
Course Credits: 2	Hours of Teaching/Week: 4
Total Contact Hours: 52	Formative Assessment Marks: 25
Summative Assessment Marks: 25	Exam Duration: 2 Hours

Practice Lab

The following activities shall be carried out in the lab.

1. Introduction to Adobe Audition
2. Basic Editing
3. Effects
4. Audio Restoration
5. Sound Design
6. Creating and Recording Files
7. Multi-Track Editor Orientation
8. Editing Clips
9. Automation
9. Scoring Audio to Video
10. Create a haunted environment
11. Compose music to a video
12. Auto tune
14. Voice over recording
13. Fade in and Fade out of audio

Reference Books:

1. Adobe Creative Team, Adobe Audition CS6 Classroom in A Book, Adobe Press, 2012.
2. Antony Brown, The Focal Easy Guide to Adobe Audition 2.0

Course Code: DSC-11	Paper Title: Surface and Lighting
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 40	Formative Assessment Marks: 40
Summative Assessment Marks: 60	Exam Duration: 2 Hours

Course Contents

Contents	Hours
Unit - 1	
Introduction to Surfacing and Lighting. Understanding Color Theory, Introduction to lighting and importance of lighting animation - Basic Lighting Concepts and types of lights and Change the color of the light and light attributes and rendering - Shortcuts	10
Unit - 2	
Application of lighting in Maya. Basic Lighting in Maya. Basic Lighting Concepts. Light Linking. Three point lighting set up. Absorption, Reflection of Light, Refraction of Light. Ambient Light. Directional Light. Point Light. Spot Light. Area Light. Volume light. Shadows. Raytraced Shadows	10
Unit - 3	
Illumination. Surface Geometry. Surface Generation Techniques. Colour and Shape Generation. Layering and Compositing. Light linking. Introduction to UVs. UV unwrapping. UV unfolding. Types of UV unwrapping. Spherical. Cylindrical. Planner. Automatic.	10
Unit - 4	
Introduction to Substance Painter. Link to Raster Software. Bump Mapping. Types of textures. Types of materials. Basic properties of materials. Reflection. Refraction. Colour. Transparency. Hyper-shade.	10

Reference Books:

1. Alton, John. Painting with Light, University of California Press, 1995. (Originally published by Macmillan, 1947.) ISBN 0-520-08949-9.
2. Texturing and Modeling: A Procedural Approach, AP Professional, 1994. ISBN -12-228760-6.
3. Light Fantastic: The Art and Design of Stage Lighting. Prestel Verlag, 1999.
4. Film Lighting, Upstill, Steve. Prentice Hall Press, 1986. ISBN 0671622714.
5. The RenderMan Companion: A Programmer's Guide to Realistic Computer Graphics, Addison-Wesley, 1990. ISBN 0-201-50868-0.

Course Code: DSC-11 Lab	Paper Title: Surface and Lighting Lab
Course Credits: 2	Hours of Teaching/Week: 4
Total Contact Hours: 52	Formative Assessment Marks: 25
Summative Assessment Marks: 25	Exam Duration: 2 Hours

Practice Lab

The following activities shall be carried out in the lab.

1. Type Texturing
2. Rusty Automotive Texturing
3. Texturing Alley – preparing / collecting texture
4. Texturing Alley – texturing using nodes
5. Low Poly game Texturing – texturing using nodes & texture using normal mapping
6. Human Skin Texturing - preparing / collecting texture & texturing using nodes
7. Animal Skin Texturing - preparing / collecting texture& texturing using nodes
8. Practical 01 Types of lights / properties / work flow
9. Lighting techniques - 2 point & 3 point
10. Create a torch; use fog; glow
11. Create a street, use ramp, volume light (for games)
12. Under water scene / early morning scene
13. Interior and exterior lighting
14. HDRI mapping / DOF Lense / Global illumination (GI) / Final Gather (FG)

Reference Books

1. Dariush Derakhshani , Introducing Maya 2016: Autodesk Official Press book, 1 Edition, Sybex, 2015.
2. Steven Worley, Ken Perlin, Texturing and Modeling: A procedural approach, 3rd Edition, Morgan Kaufmann, 2003.
3. Owen Demers, Digital Texturing and Painting, New Riders, 2001.
4. Jermy Birn, Digital Lighting and Rendering, 3rd Edition, New Riders, 2013

Course Code: DSC-12	Paper Title: Aesthetics of video editing
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 40	Formative Assessment Marks: 40
Summative Assessment Marks: 60	Exam Duration: 2 Hours

Course Contents

Contents	Hours
Unit - 1	
Linear and Non Linear Editing, Principles of Video Editing, Symbolism, Simultaneity Continuity, Inspiration for Every Editing, The Three -Point Edit, Working in the Timeline, Transitions, Key framing Color Correction & Color Grading	10
Unit - 2	
Stabilizing a Shot, Controlling shaky video, Cropping the borders, Corner Pin Tracking, Animating Masks, Motion Track, Introduction to Mask, Animating Masks, Creating a Simple Rotoscopic Animation	10
Unit - 3	
Filters, Plugins, Path Animation, Compound Effects, Precomposing and Nesting, Applying Layer Blending Modes, Wave World and Caustics, Looks, Presets, Markers, Collecting Projects	10
Unit - 4	
Stabilization, Shutterfix, Camera Properties, Focal length, Resolution, Marker placement Layering solution, Scene Orientation, Exporting Solution	10

Reference Books:

1. Gary H. Anderson, "Video Editing and Post – Production: A Professional Guide", Focal Press Publications, 4th Illustrated Edition, 1999.
2. Declan McGrath, "Editing and Post Production", Focal Press Publications, Illustrated Edition, 2001,
3. Eve Light Honthaner, "The Complete film Production Handbook, Volume 1", Focal Press Publications, 3rd Illustrated Edition, 2001.
4. Adele Droblas and Seth Greenbeg, "Adobe Pre 2001, Miere Pro 2 Bible (W/ Cd)", Wiley – India Publications, 2007.
5. J. J. Marshall and Zed Saeed, "After Effects 5 Bible", John Wiley and Sons Publication, 2002.

OPEN ELECTIVE

Course Code: OE-4	Paper Title: Editing
Course Credits: 3	Hours of Teaching/Week: 3
Total Contact Hours: 40	Formative Assessment Marks: 40
Summative Assessment Marks: 60	Exam Duration: 2 Hours

Course Contents

Contents	Hours
Unit - 1	
Introduction to Editing , Types of Video Editing, Applications of Video Editing, Compound Effects, Nesting, Applying Layer Blending Modes, Motion Graphics , Aspect ratio , File Formats, Video compression.	10
Unit - 2	
Rendering Video , Timeline , Effect, Presets, Colour Grading , Colour Correction, The Three -Point Edit, Keying, Stabilizing a Shots, Titling, Cropping	10
Unit - 3	
Footage pre-processing, Merge/Split tracks, Marker placement, Layering solution, Tracking multiple footages, Stabilization, Precomposing & Nesting, Basic Compositing, Blending Modes,	10
Unit - 4	
Sound - Sound Basics, Recording Techniques, Stereo Recording Techniques, Introduction to audio software's, noise cancelling, audio filters, audio matching, frequency and pitch. time rapping, music. synchronization	10

Reference Books:

1. Eve Light Honthaner, "The Complete film Production Handbook, Volume 1", Focal Press Publications, 3rd Illustrated Edition, 2001.
2. Adele Droblas and Seth Greenbeg, "Adobe Pre 2001, Miere Pro 2 Bible (W/ Cd)", Wiley – India Publications, 2007.
3. J. J. Marshall and Zed Saeed, "After Effects 5 Bible", John Wiley and Sons Publication, 2002.
4. Drew O. McDaniel, Rick C. Shriver, Kenneth Ray Collins, "Fundamentals of Audio Production", Pearsons A & B Publications, 2008,
5. John Harrop, "Acting: Theatre Concepts", Routledge Publications, 1992