

# **SWAMI VIVEKANAND UNIVERSITY, SAGAR (M.P.)**



## **SYLLABUS**

**For**

**M.Sc Animation**

**CourseCode:MSCAN**

**Department of Animation**

**Faculty of Animation & Multimedia**

**Duration of Course : 2 Year**

**Examination Mode : Yearly**

**Examination System : Non-Grading**

**Swami Vivekanand University, Sironja Sagar (M.P.)**



2017-18

**Communication & Communication Theories and Introduction of advertising  
& Market research - MSCAN 101**

**UNIT-1**

Communication & Basic Models: Definitions, Elements of Communication, Communication act, Sender, Message, Channel, Receiver, Effects, Feed Back, Communication process, Basics models of communication.

**Advertising:** Meaning, Nature, Functions, Benefits, History, Nature (Art, Science, and Profession), Ethics in Advertisement. Social and Economic aspects in advertising.

**Types of Advertising:** (Classified advertisements, Display advertisements, Hard Sell advertisement, Soft sell advertisements, Reminder advertisements, Prestige advertisements, Humorous advertisements, Professional advertisements, National advertisements, Local advertisements, Global advertisements, Product Advertising, Service Advertising, Institutional Advertising, Consumer Advertising, Distributor Advertising, Retail Advertising, industrial Advertising, Educational Advertising, Financial Advertising, Travel and Entertainment Advertising, Co-operative Advertising, Advertising, by Government and Public Bodies).

**UNIT-2**

Types of Communication: Intra personal – Inter personal, Group, Mass communication and Mass-Line communication – Functions of communication – Effects. Speech communication – cognition – Selective perception – Selective retention – Selective expression – Verbal and nonverbal communication. Advertisement relationship with the product life cycle. Advertisement as a communication tool. Marketing communication process. Advertisement as a Marketing Tool: Marketing, Marketing Mix, Advertisement and Product (Positioning and Packaging), Place, Price, Promotion. AIDA Model.

**UNIT-3**

**Mass Communication,** 'Mass' Concept, Characteristics of mass audience, Typology of audience, Classification of Media, Functions of Mass Communication, mass media and modern society – functions – mass media and democracy. Media Selection and Media Planning: Types of Media: Newspapers, Television, Radio, Magazines, Web advertising, Exhibitions, Telemarketing, Posters and Hoardings. Advertisement Campaign: Campaign Planning and Process. Advertisement Agency: Structure, Client Agency Relationship, Agency Media Relationship, Compensation. Advertisement Budget: Meaning & Methods. Advertisement Copy & Layout Designing: Types of Advertisement Copy, Types of Headlines, Components of Layout.

**UNIT-4**

Visual Communication Systems Early communication systems in India, Introduction to India Art History: Ancient period (3500 BCE-1200 CE), Islamic ascendancy (1192-1757), Colonial period (1757-1947), Independence and the postcolonial period (Post-1947) History of European Art: Ancient Middle East, Ancient Egypt, Ancient Aegean civilizations, Medieval period, Renaissance, Baroque period, Neo-Classicism, Post-Modernism. Christianity, ideology, Classical, Byzantine,



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Medieval, Renaissance, Baroque, Modern. Production: Advertisement Production Process and Implementation, Typography.

**UNIT-5**

Color Theory & Color Composition Basic color theories, colors. Research in advertising, planning, execution, copy research, market research; ethical aspects of advertising; law and advertising; advertising and pressure groups; emerging trends.

**Reference Books:-**

Communication & Communication Theories by Simon Haykin (Author), by (Author) Bojkovic & Milovanovic

Rao. Introduction of Advertising & Market Research by Luke Sullivan, Bible. Mass Communication By

Arihant Experts.



**Web Designing & Introduction of 2D & 3D Animation - MSCAN 102**

**UNIT-1**

**The Fundamentals of Web Design:** The web we know today, working of web, history of web, evolution of world wide web, now days the use of internet, sample web pages, how did they are constructed, function and stand point, hands on good web sites , browsing good web sites, analyzing a sample site from a functional standpoint.

**The Principal of web Design:** Well designed site from a poorly conceived one, difference between web and print design, focusing on those issues a web designer, discover top tem web design, and critique a sample site from an esthetic perspective. Getting Started in **Web Design:** A technology does a web designer need to be master, look at well- stocked web design, software option for digital imaging, HTML editors and Multimedia, real-world design environment.

**UNIT-2**

**Introduction to HTML:** Begins with an HTML overview, how HTML evolved, how to construct a basic HTML page, explore the ins and outs of formatting, Web colors, images, and links, essential elements of a Web page, to create files and folders using the correct directory structure, view source code to learn from the inspiration of others, create an online menu for a restaurant.

**Tools for Tables:** HTML tables are used everywhere on the Web as a layout, content organization tool, tools for tables, construct them,, format them, place elements in them, and fix them when they break, to add sophistication to your tables by modifying their properties, adding background colors and images, and using cols pan and row span tags, explore a common application for tables by building an e- commerce product page from scratch.

**Putting it all together:** A taste of some of the challenges of a professional HTML assignment, the dynamic templates often used to construct e-commerce sites, an introduction to how HTML interacts with other coding languages such as ASP and Cold Fusion, the "front end" of a form is created, to create common form elements, wraps up with a guide to common HTML troubleshooting issues, create a 4- page "prototype" for an ecommerce site.

**UNIT-3**

**The Stage, Transitions, and Behaviors:** Script dictates techniques for transitioning your content in and out of main interface, drawing attention to important information and features with quick, tasteful animations.



**Framing and Usability:** HTML designing with Flash methods of embedding Flash site in an HTML page for optimal viewing. Publish your site, usability concerns, Flash usability debate. HTML for a seamless experience, and publish it to the Web.

**The Future of Flash Site Design:** Flash Web site with a splash preloaded page that occupies users' interest as main site loads.

## UNIT-4

### Human Anatomy

**Head** - Frontal Bone – Temporal Bone – Orbit Bone – MALAR Bone – Mandible Bone – Maxilla Bone – Lower Jaw Bone – Mastoid Bone.

**Hand** – Humorous Bone – Ulna Bone – Radius Bone – Carpals Bone – Meta Carpals Bone – Trachea Bone – Inner Cornville Bone – Outer Cornville Bone – Sternum Bone.

**Leg** – Great Trochanter – Small Trochanter – Pub avis Bone – Isocheim Bone – Serum Bone – Trivia Bone - Tarsal Bone – Meta Tarsal Bone – Phalanges Bone – Oscalcus Bone.

**Abdomen** – Clavicle Bone – Stascapula Bone – Serum – Thorax Bone – Twelfth rib Bone – Crest of Ilium – Exilic – Sacrum - Lumbar Vertebrae.

**Neck** – Atlas – Axis – Epiglottis – Vocal Ligament – Hypoid Bone – Cervical Bone – Vertebrae Bone.

## UNIT-5

### Cell Animation

**Digital 2D Animation orientation** – Basic factors affecting the illusion of motion – Impact of digital techniques on the craft of film and video animation – Professional animation practice and job description – Prevailing file format standards and other compatibility issues – History and future trends of computer animation application in the visual arts.

**2D animation application software interface** – Default setting and user preferences – Document setup. Import and export formats – Document and timeline window feature – Tools and commands palettes – Mediaselection tools and techniques Asset-management features.

**2D graphics-creation features** – Underlying data type: raster – vector – Raster painting and/or import features – Vector shapes – Vector free-form and control-point placement tools – Features specific to the program in use.

**2D graphics editing features** – Basic geometric transformation – Boolean operations on shapes – Object stroke attributes – Object fill attributes – Shading techniques (blends – gradients) – Packaged effects (extensions – Plug-ins) – Features specific to the program in use.

**2D animation frame-sequencing features** – Straight-ahead animation – Key frames animation – Motion paths – Applying geometric transformations over time – Intertwining options – Looping and palindrome motion – Features specific to the program in use.

### Reference Books:-

**Web Designing** by Anderson, Erin, et al. *Interact with Web Standards: A holistic approach to webdesign*, NewRiders, 2010.

The author, Thomas Powell, developed the *Web Design*.

Castro, Elizabeth. *HTML5, and CSS3, Seventh Edition: (Visual Quick Start Guide)*, Peachpit Press, 2013.

McFarland, David Sawyer. *Html/css: The Missing Manual*, O'Reilly Media, 2010

Bible For 2D and 3D animation

The Animation Book: A Complete Guide to Animated Filmmaking--From Flip



**Drawing & Sketching & Script writing & Storyboard designing - MSCAN 103**

**UNIT-1**

Indoor & Outdoor Sketching & Drawing Basics of Sketching & Drawing (with practice): Lines in different grades of pencils HB +0.8b, Shading in pencil medium, shading in different angles of pencil strokes, formatting in different textures with pencil, shading, simple objects in drawing, simple shapes of geometrical shapes, paper division & forming of sky land, stones, deserts, trees & plants, roadsides, rivers, perspective in lines in landscapes, different head shapes, characters, human anatomy (e.g.: Hands, legs, arms, different characters). Drawing. Introduction to Scriptwriting, screenplay and teleplay Scripts are elements: Basics of

Scriptwriting, Use of scriptwriting, Action, Scene Headings, Character Name, Screenplay Page Breaking, Short Lines/Poetry/Lyrics, Titles or Opening Credits, Screenplay Title Page, Continued and Revisions, Header Text + Do's & Don'ts, Screenplay Related Formats and full knowledge about teleplay script.

**UNIT-2**

Geometrical Drawing & Perspective Drawing. Scriptwriting for both short film: Dialogue, Parenthetical, Extension, Shot Transition, Dual-Column Dialogue, Act numbers, Scene Numbers, Cast List, short lines, dialogue paragraphs, Script Styles & Types, Script Length Scene Heading Action Description, Character Name, Dialogue, Parenthetical, Extension, Transition, Shots.

**UNIT-3**

Still Life, Compositions (Based on historical, Social & Cultural) Scriptwriting for feature film: Dialogue split by Action, Emphasis in Action, Abbreviations, Short Lines, Dialogue Paragraphs, Montage & Series of Shots, Supers - Titles, Signs, etc, Phone Calls and Inter cuts two people talking at the same time.

**UNIT-4**



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Mediums & techniques of Paintings. As student develops their own script: Attention will be paid to principles of script analysis, narrative strategy, genre & structure. By the end of the semester, students are expected to have developed a script treatment and flashed out the first act in script form.

## UNIT-5

Clay Modelling .Introduction to storyboard: Introduction, Multimedia Storyboarding Tools, The Advantages of Storyboarding, Interactive Storyboarding, Using Interactive Storyboarding to Speed-up the Content- writing Phase, Using Interactive Storyboarding to Speed-up Report Document Production. Steps of storyboard writing: Storyboard table, Topic, Timeline, Sketches, color scheme, text attributes, Audio, camera angle, Interaction of buttons and text.

### Reference Books:-

Drawing & Sketching, Drawing on the Right Side of the Brain by Betty Edwards

Keys to Drawing by Bert Dodson The Artist's Guide to Sketching by James Gurney and Thomas

Kinkade The Screenwriter's Bible: A Complete Guide to Writing, Fo... by David Trotter Art of Storyboard Paperback – Import, 30 Nov 2004 by Don Bluth (Author)

<p style="text-align: center;"><b>Graphic Design &amp; Visual Arts. &amp; Introduction of Digital Photography &amp; Art - BSCAN 104</b></p>
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## UNIT-1

### Visual Art

An orderly arrangement of elements using the principles of design, The principles of design help you to carefully plan and organize the elements of art so that you will hold interest and command attention. This is sometimes referred to as visual impact. In any work of art there is a thought process for the arrangement and use of the elements of design. The artist who works with the principles of good composition will create a more interesting piece of art it will be arranged to show a pleasing rhythm and movement. The center of interest will

be strong and the viewers will not look away, instead, they will be drawn into the work. A good knowledge of composition is essential in producing good artwork. Some artists today like to bend or ignore these rules and therefore are experimenting with different forms of expression. We think that composition is very important. The following will assist you in understanding the basics of a good composition. The Exploration Stage: The

past and future of Photography (Digital Photography),

**Types of Cameras:** Choosing Cameras, Start Taking

Photos, Using buttons and menus, Selection and Treatment: Selecting image size and quality, Image management, Photo editing tools Color management. Execution, Installation & Presentation:

Choosing Exposure modes, how your exposure system works and affects your image. Installation of different types of Image Editing Software, Slide show programs and background music, E-mail and websites, displaying images Wallpapers.

**Digital Photography (Part - 1)**



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Inside the digital camera: Image sensor and types, In-Built memory and memory cards. The Principles of Photography: The General **Principles of Photography**Types of cameras: Miniature Cameras, medium format cameras, large format camera and digital cameras. Comparative study of digital and analogue (SLR) camera.

Advantages and applications of digital **photography**.**Lenses:** Normal, wide, Tele, zoom, PC and TS lens. Working of lens and angle of view of a lens.Camera Controls: Shutter speed aperture exposure control, auto winder or motorized camera, depth of field, selective focus.Exposure Meter: Incident meter and reflected meter.Metering System: Center weighted Spot and Matrix metering. Filters: UV Filter, Polarizingfilter, special effect filters and tripod. Composition: Creative Composition, rule of thirds and Golden section.Managing Your Digital Assets: Managing digital cameras, Cleanliness, Precautions, Managing Images printouts, Burning CDs.Beyond the Basics: Camera Controls and Creativity, About Digital Photographs, Automatic all the way working of Digital Camera andcomparison Selecting Images Size and Quality (Photoshop), Definition of shutter speed in detail, delineation of aperture, Using Shutter Speed in detail, definition of aperture, Selecting Exposure Modes, Types of Lenses.

## UNIT-2

### Principles of Compositional Design

The principles of design are the recipe for a good work of art. The principles combine the elements to create an aesthetic placement of things that will produce a good design.Center of interest, Balance, Harmony, Contrast, Directional Movement, Rhythm Basic **Designing Software:** Windows Paint, Basics Concept making and Implement on Computer, Color knowledge,Generating Ideas, Basics About Various software's in Industry for still image manipulating, knowledge about pixels, measuring units in diff image manipulating software's. Photographing people: Photography aesthetics of people (Male, females, couples, groups & child Photography) in studio and outdoor and available light.Product Photography: Using Selective Focus, Exposure affects you Images, Controlling Brightness and Contrast, Close up Photography.Interior and Exteriors: Architectural photography, Industrial shooting (Internal & external) and use of various wide angle lenses. Landscape photography, science shorts.

## UNIT-3

Vector Graphics (Designing, Color Theory, Vector Designing & Editing, and Text Formatting):Interface: Working with menus, toolbars, Dockers.Document Setup: Setting Page Size& Orientation, Document Navigation Rulers & Guidelines: Status Bar.Text: Formatting, Text Layout, Skewing and rotating, creating Drop shadow, Text to Path, Extruding text.Objects: Grouping & locking objects, Combining & breaking apart, Transforming & Shaping, Cutting objects apart, Trim, weld & Intersection of objects. Lines & Curves: Using freehand & Bezier tool, Line properties, Arrowheads Eraser & artist media tools Nodes & Paths. Color & Fills: Solid Color, Color Palettes, Eyedropper & Paint bucket, Fountain, Fills, Patterns, TextureFills, Interactive Mesh Fill. Special effects: Envelopes, Blends, Perspective, Shadow Objects, Power clip Command, Transparency, Distortion, Contour, Lens Docker.Complex Shapes: Polygon & Stars Spirals Printing Menu.

Action and Sports Photography: To capture the action in different ways to know the game first Selecting the equipments according to the game. (Usage of various zoom and tele- lenses and tripods)The Photo Shoot from Start to Finish: Photography on the given theme to selecting subject to





select the equipment the location and finally shooting. Transferring Devices: ATA-Flash-Cards, The exchange of digital information between two or more computers. Data is usually transmitted via a direct cable connection, a computer network, AD conversion, I.C Cards PC-Card, ID Photo MO Disk. The smallest rewritable optical storage medium for digital cameras. A joint development from Olympus, Sanyo and Hitachi Maxell. It features an amazing capacity of 730 MB. This means about 2,000 photos can be taken before the media needs to be changed.

## UNIT-4

### **Raster Graphics (Designing, Color Theory, Raster Designing & Editing, text Formatting:**

Getting to Know the Work Area, starting to work in Adobe Photoshop, Color modes, Color, Using the tools, Selecting and using a tool from the toolbox. Using the tool options bar and other palettes, Customizing the workspace, Using Photoshop Help, Viewing and editing files in Adobe Bridge, Embedding information for easy identification,

Automating routine tasks, Resolution and image size, Straightening and cropping an image, Making automatic adjustments, Manually adjusting the tonal range, Replacing colors in an image, Adjusting lightness with the Dodge tool, Adjusting saturation with the Sponge tool, Retouching and Repairing, Repairing areas with the Clone Stamp tool, Using the spot Healing Brush tool, Using the Healing Brush and Patch tools, Retouching on a separate layer. Working with Selections: About selecting and selection tools, Selecting with the Magic Wand tool, Using the Magic Wand with other selection tools, Working with oval and circular selections, Selecting with the lasso tools, Rotating a selection, Selecting with the Magnetic Lasso tool, Cropping an image and erasing within a selection, Layer Basics, Using the Layers palette. Image converter Semiconductor-image converter (CCD chip).

Image transmission/ transfer the digitization of images means they can be transmitted via data carriers or networks without the loss of quality or copied an infinite number of times. Blue Tooth: Blue tooth carries a WAN concept to a small scale, low power 10 m range, also known as personal is networking (pan) Bluetooth Profile Dependencies, data transferring, connection, wireless signals. Bluetooth file transfer profile (FTP) - enables browsing of the file system of other Bluetooth devices which support Bluetooth FTP, serial port (SPP) provides a wireless serial connection to other Bluetooth devices, human interface device (HID) enables the use of Bluetooth input devices (keyboards and mice).

## UNIT-5

Page Making: Document Setup Option Page Type, Page Style, Page Numbering, and Page Measurement Standard Tool Bar Options Create New Document with Setting, Open & Store Options Preferences Import & Export Objects options, Scanning, Document Setup, Columns Guide Setting, etc. Formatting Tool Bar Option Copy Paste Options, Cross Pasting, Multiple Pasting, Insert Objects, and Import Images & Text from other Objects etc. Text Setting Options Fonts Setting, Control Palette, Paragraph Setting, Text Warping, Master

Files, Text Rotating options Alignment Setting, Text Colors. Rulers & Guide Lines, Print Out Bar Import Objects, Polygon Setting, Draw & Filling Objects, Alignment Setting of the Images etc. **Data Cable:** USB based wires with both ends with the commutability of USB with computers, palmtops, Ipods, to transfer the data from one device to another, compatibility with memory card readers pro, different devices in which data cable is used, use of data cable in internet browsing. Pen Drive: Temporary storage devices, attach with computer, having USB head compatible plug and play utility. I-pods, Pen drives with music player option, pen drive capacity of data storage, software's of pen drive for win 98, formatting the pen drive, labeling the pen drive, handling and caring of the pen drive, diff brands dealing with pen drive.



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**CD Burning:** CD writing, cd writing software's, making video of still images, making data cd, making the labels for the cd, formatting the re-writable cd, diff types of CD available, storage capacity of CD's , labeling the CD's, storing and handling the CD's, CD Burning.

**Reference Books:-**

Graphic Design and Visual art by Ellen Lupton and Jennifer Cole Phillips.

Graphic Design and visual art Bible book. Digital Photography and art Bible book & The Art of Digital Photography Hardcover – by John Hedgecoe (Author)

**Practical - Visual Form- MSCAN 105**

**Visual Form**

Exploring the look and feel for • animation through concept art

Planning character design, layout design, illustration • style, composition, staging, backgrounds

A study of indigenous design and painting, both • contemporary and traditional to understand and analyze a variety of styles and visual language



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**Practical - Elements of Design - MSCAN 106**

- Line, Color, Texture, Shape, Form, Value, Size



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**Animation Principles And History - MSCAN 201**

**UNIT-1 +  
Principles**

Understanding principles that translate sequential • images into action to make animation believable  
Understanding properties of matter • Making use of the wave principle, delayed secondary • action,  
slow and fast action impact , speed, weight, tendency of weight to move in a certain way, recoil  
effects, squash and stretch related to weight, overlapping action, follow through Animating force  
acting on objects , object • weight, construction, flexibility, object behaviour when force acts on them  
Principles of Timing • Gaining an insight into the invisible • concept of time in nature Understanding



the basic unit of time in animation • Emphasizing the difference between • caricature, drama, humour  
Timing governing acting and movement

## UNIT-2

• The use of anticipation, action, reaction • Methods of doping, writing exposure sheets, bar sheets •  
Planning accents, beats, scene timing, spacing • of drawings, holds, easing in and out Animating to  
music • Principles of Movement • Understanding the meaning of movement and • movement in  
nature and what movement expresses Awareness of how mood and feeling can be

## UNIT-3

• conveyed through movement and animate and inanimate object behaviour Examining the laws of  
motion in the context of • animation; cause and effect, thrown objects, rotating, force, oscillating  
movement, friction, resistance Studying the tendency of weight to • move in a particular manner  
Simplification and exaggeration of movement •

## UNIT-4

### Animation History

To gain an understanding of the evolution of animation • Delving into animation history- both of  
India and • the world. Precursors to animation: Cave paintings, animation toys

## UNIT-5

• Animation before Disney • Studio animation • Feature animation • Experimental animation •  
Personal films and expression • Adult animation • Animation Today •

### References for principles and theory

Harold Whitaker and John Halas, Timing for • Animation, Focal Press, Oxford, 2002

Preston Blair, Cartoon Animation, Walter • Foster Publishing Inc., CA, 1995 Edited by Peter Hames,  
Dark Alchemy, The Films • of Jan Svankmajer, Greenwood Press, 1995

John Culhane, Disney's Aladdin – The Making • of an Animated Film Hyperion, NY, 1992

### References for History

Dave Smith, The Official Encyclopedia – • Disney A to Z Hyperion, NY, 1998 Vol : 18, Special  
Issue of Art History, March 1985 • Leonard Maltin, Of Mice and Magic – A • History of American  
Animated Cartoons Plume, Penguin Books. USA, 1990 Bob Thompson, Disney's Art of Animation –  
• From Mickey Mouse to Hercules Hyperion, NY, 1997 • Donald Craften, Before Mickey – The  
Animated • Film [1898 – 1928], The University of Chicago Press, 1993 • Peter Hames (edited by),  
Dark Alchemy, The Films • of Jan Svankmajer, Greenwood Press, 1995 John Culhane, Disney's  
Aladdin – The Making •of an Animated Film Hyperion, NY, 1992 Alan Cholodenko (edited by), The  
Illusion of Life- • Essays on Animation Power Publication in association with Australian Film  
Commission, SYD, 1991 • Eric Smoodin (edited by), Routledge, Disney Discourse • – Producing the  
Magic Kingdom, London, 1994 Jay Leyda (edited by), Eisenstein on Disney, • Seagull Books,  
Calcutta, 1986 Ernest Pintoff, Animation 101 Michael • Wiese Productions, CA, 1999

## Animation Process - MSCAN 202

## UNIT-1

### Animation Processes

Covers the entire process from script to screen in • process for an animation film (short or feature)  
Overview of the Process • Preproduction, Production, Post Production • A comparison between live  
action film making & • animation The primary difference being that an animation film tends to be



pegged down pretty accurately by the end of the preproduction process itself whereas for a live action film it is close to completion only at the end of editing which is a post production process.

## UNIT-2

### Preproduction

Story to Script • Whether adapted or original, taking the story from a • verbal or spatial medium like a book or graphic novel to a form suitable for making a film. What makes a good story?

Plot & Character: Action Plots & Mind Plots. • Analysis of different types of plots Archetypes v/s Stereotypes - understanding • of archetypes and a brief introduction to the mono myth (hero's journey). Why Animation? (instead of live action)

## UNIT-3

• Animation as a story telling (narrative) medium • Animation as an artistic medium • Visual Concepts, Character Exploration & Storyboards •

Animatics • Character Design & Model Sheets, • Layouts & Scene Planning

## UNIT-4

### Production

Animation • Acting - Animation is not about moving • images but moving people

Traditional 2Danim • a. Linetests - Keyframes & Timing (breakdowns • & inbetweens) also brief introduction to thumbnailing (for quick exploration of alternative methods of animating a scene)

Study comparisons between different • rhythms of animation Executing straight ahead and inbetweened planned • animation, limited animation full animation Drawing key frames, breakdowns, • inbetweens, animation cycles Cleanups •

## UNIT-5

### Post Production

Voice, Music & Effects • Understanding the dynamics of sound design and • use of sound as a key component of animation Designing a sound track for animation including • music, dialogue, voice overs, lip synch and FX Recording and mixing multiple tracks • Post processing sound •

Compositing & Editing • Work in Progress. Development of a film from Animatic • to Edit with different scenes at different stages. Coming together of the various elements of the scene. •

Final Mixing of Sound & Final Edit • Understanding the dynamics of camera • moves and magnifications Experimenting with camera techniques •and working directly under camera

- Using registration fields, table • moves and peg movements Screening & Feedback •

Pitching a Project, Financing, Production & Distribution •

### References for processes

Shamus Culhane, Animation from script to • screen, St.Martin's Griffin Press, NY, 1990

Richard William, The Animators Survival Kit, • Faber and Faber, New York, London, 2002

Kit Laybourne, The Animation Book, • Crown Trade Paperbacks, NY, 1998

Tony White, The Animator's Workbook- Step • by Step Technique of Drawn Animation, Watson-Guptill Publications, 1988 Mascelli Joseph V, The Five C's of • Cinematography: Motion Pictures

Filming Techniques, Silman-James Press, 1998 Daniel Arijon, Film Technique, Silman-James Press, 1991 • David Sonnensch, Sound Design: The Expressive • Power of Music, Voice and Sound Effects

in Cinema, Michael Wiese Productions, 2001 David Lewis Yewdall, Practical Art of Motion Picture • Sound, Second Edition, Focal Press, 2003 Tomlinson Holman, Sound for Film and • Television,

Second Edition, Focal Press, 2001

### References for Visual Form



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Mark Cotta Vaz, The Art of Finding • Nemo, Cronicle Books, 2003

Gary Russell, The Art of The Fellowship of • the Rings, Houghton Mifflin, 2002

Gary Russell, The Art of The Two Towers (The • Lord of the Rings), Houghton Mifflin, 2003

Gary Russell, The Art of The Return of the King • (The Lord of the Rings), Houghton Mifflin, 2004

Will Eisner, Graphic Storytelling, Poorhouse Press, 1996 • Will Eisner, Comics and Sequential •

Art, Poorhouse Press, 1985 Scott McCloud, Understanding Comics, • Perennial Currents, 1994

Bradford W. Wright, Comic Book Nation, • Johns Hopkins University Press, 2003

Stephen Missal, Exploring Drawing for • Animation (Design Exploration Series),

Thomson Delmar Learning, 2003 •



## Digital Video & sound editing+ Cartoon animation & Special effects - MSCAN 203

### UNIT-1

Concept & Objectives of Editing, Software & tools, Continuity & Jerk Enter & Exit in Frame, Title, Credits & Sounds. Sound editing, mixing sound, laying sound tracks, syncing sound and picture. Capturing video. Editing techniques for News, Documentary and Fiction & Ad Film. Picture transitions and their use, Elements of the editing, motivation, information, shot composition, sound, camera angle, continuity. Types of the editings, action edit, screen position edit, form edit, dynamic edit. Do's and don'ts of editing Voice over and sound bytes, dubbing and mixing of sound. Computer hardware for editing. Comparison between Animated & Realistically

**Animated Films:** Watch the different animated flicks and make a comparison report on them.

### UNIT-2

On line editing in a multi-camera TV programme production.

**TV Graphics and Animation:** Theory and Practice .Elements of 2D Graphic Elements of 3D Graphics. 3D Modeling. 3D Animation .Special effects creation .Environmental special effects Lighting camera & texturing .Introduction to virtual sets .

**Film Analysis:** The Editor's point of view Extensive sound recording, video editing, graphics and animation practicals. Participation in production exercises. Timing & State: Watch the different animated flicks and make a comparison report on them.

### UNIT-3

**Introduction to sound:** Sound, Digital sound files, different sound formats, midi & digital audio, creating digital audio files, sound producing, sound extracting, Advantages and disadvantages of midi & digital, choosing between midi and Digital audio.

**Linking files:** Sound for the World Wide Web, adding the sound to your multimedia project, production tips, audio recording, keeping track of your sound, testing and evaluation. Movements in Animation: Understanding key frames, key frame animation, fine tuning the animation, Manual animation, path follow animation and frame rate of animation.

### UNIT-4

**Record clips & editing:** Sound recording, editing digital recording, trimming, splicing and assembly, volume adjustments, format conversion, re sampling or downloading, fade-ins and fade -outs, equalization, time stretching, digital signal processing, reverting sound, making midi audio, audio file formats. Frames: Frame rate, resolution, size, video standards used worldwide, and fps.

### UNIT-5

**Special effects:** Adding effect automation enveloping, adding a volume envelop, adding a panning envelop, previewing effect automation, applying effect automation, adjusting envelope, adding envelop points, flipping a envelop points, setting fade properties, cutting, copying, pasting, envelope points, adding mirror and wave

hammer, pan to left , pan to right, dry out, wet out, convert mono to stereo, looping.

**Finalize files:** Burning the audio CD, mp3, making the remix sound track with using all the special FX from the software. Exporting the files in diff formats, save in wav, mp3 etc.

### Digital Animation & Special Effects

**Introduction to special Effects:** Knowledge about effects, making effects, applying effects

**Types of special effects:** Particle system, masking, keying, color range, text effects, CG effects





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**Synchronization with editing:** Tips and tricks for editing, advance knowledge about editing, compositing, Final rendering (output)

**Reference Book**

Book 1. Adobe Premiere Pro CS6 Classroom in a Book Richard Harrington and Maxim Jago (Author)

Book 2. Adobe After Effects CS6 Classroom in a Book Richard Harrington and Maxim Jago (Author)

Book 3. Adobe Audition CS6 Classroom in a Book Craig Anderton (Author)



**Advance 3D animation(Modeling to animation) - MSCAN 204**

**UNIT-1**

Animation, multimedia & virtual reality: Fundamental key frame animation, repeating animation over time, Hierarchical linking, Key frame, Parameters Out of- Range, Setting Animation Keys, Animating the Rotation of the Dummy Object, Creating a continuously Looping Animation. Conceptual knowledge of game creation Understand the history and evolution of game design and technology; Honing creativity, design, computer and problem-solving skills in the area of game Design

**UNIT-2**

Using advanced techniques: Assigning Constraints on the Motion Panel, Applying an Ease Curve to Control Animation, Multiplier curves, Link constraint, Inverse kinematics, Solver, Applying Multiplier Curves, and Switching Hierarchical Parents. Advanced Modeling: Editable poly, Symmetry modifier, Lathe modifier, Merge, Quad polygon, Settings \dialog, NURMS, Editing Using Multiple Viewports, Adding Detail to the Model, Tessellate, Deformation, XRef, Using Modifiers to Add Detail to 3D Objects, Merging Files While Retaining a Connection. Advanced Animation Character Animation - Walk cycle, Run cycle, Jumping, Timing, movement, mood, camera and lighting; Animation using weights, Character Rigging: Skeletons, Skinning and Constraints for controls; Forward Kinematics and Inverse Kinematics, Deformers

**UNIT-3**

Advanced lighting effect: Placing and adjusting photometric lights, Using exposure control, Adjusting meshing parameters, Controlling color bleed and reflectance, Making materials act as lights, attenuation, Direct illumination, Indirect illumination, Refine Iterations, Filtering,m Reflectance, Placement and Adjustment, Applying Exposure Control, Setting Radio city Meshing at the Local Level, Controlling Radiosity Using Materials. Applying Advanced Lighting Override Material. Facial animation for lip synch; Non-Linear Animation (Trax editor), Animation Layering; Animation Planning; Secondary Animation

**UNIT-4 Marks - 20**

Advanced Animation: The Fundamentals of Hierarchical inking, Animation controllers, Track View Dope Sheet, Ease curves, Controllers, Constraints, Graph editors, Ease curves. Architectural modelling / industrial modelling and animation: Modelling the Building with exteriors and interiors, the lights should be properly placed in the scene. Modelling the Mech. components, for eg: - hand tools, Auto components & animating then with key framing. Gaming Modelling and Animation High detail low poly modelling; Poly count; Z-brush / Maya Workflow; Knowledge of Python; Level of Detail

**UNIT-5**

Preparation for Multimedia Development: Modelling a Project with a final output after using that software, TV Product Advt., News channel Logo Animation, Post production effects, Animated series, Montaz, Structural Modelling and animation.

**Reference Book**



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Book 1.Mastering Autodesk Maya 2013  
Lee Lanier (Author), Anthony Honn (Author)

**Project- 3D Animation - MSCAN 205**

Create a 1Min. 3D Animation based on a short story which includes below instructions

- Concept / Story
- Story boarding
- Background Sound
- Animatics
- 3D Characters
- Expression Sheet
- 12 Principle of Animation the project given in a video form video resolution is 720 width 576 height in PAL format burning on a CD/DVD as per data size.

**Dissertation & Viva**



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**Project- Life Drawing- MSCAN 206**

To become fluent with capturing the

- human and animal form Proportions,
- structure, volume and shading techniques

**References**

John.V.Vanderpoel, The Human Figure, • Dover Publication Inc., NY, 1958

George.B.Bridgman, Bridgman's Life, Drawing • Dover Publication Inc., NY, 197

Betty Edwards, The New, Drawing on the Right Side • of the Brain, Harper Collins Publishers, 2001  
Betty Edwards, The New, Drawing on the Right Side of • the Brain, Workbook Souvenir Press Ltd., London, 2002  
Stephen Missal, Exploring Drawing for Animation • (Design Exploration Series), (Paperback) Thomson Delmar Learning, 2003



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# **SWAMI VIVEKANAND UNIVERSITY, SAGAR (M.P.)**



## **SYLLABUS**

**For**

**M.Sc Animation**

**CourseCode:MSCAN**

**Department of Animation**

**Faculty of Animation & Multimedia**



**Swami Vivekanand University, Sagar(M.P.)**



Duration of Course : 2 Year

Examination Mode : Yearly

Examination System : Non-Grading

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**2018-19**

**Cinematography & Film Appreciation. Advance Cinematic - MSCAN 301**

**UNIT-1**

Extension theory, what is film making all about? History of cinema, Ideology of filmmaker. Evolution of art forms in cinema, Montages vs. misc in scene, New wave cinem Film analysis, Current trends, Corporatization of Indian cinema industry Maya foundation basics-theory

**UNIT-2**

Basic Still Photography Cinematography derives most of its technical and artistic skill from the knowledge of still photography. It is through still photography that students understand basic ideas like framing, exposure, shutter speeds, depth of field and lensing. By learning to use the still camera well, students actually create for themselves a solid foundation of theoretical and practical knowledge, which they can build upon as they go on to movie cameras. Maya foundation primitive modeling-modeling a table,modeling a hut,modeling a robot

**UNIT-3**

History - Cinema and Cameras Students are introduced to the art of Cinematography with its history and shown films in various genres. This encourages open discussion and also an exchange of ideas between the faculty and the class. Cinematography and its skills in the absence of present day technological advancements is a good way to learn how many optical effects were achieved through simple means without sophisticated gadgetry. Introduction to nurbs basics-theory

**UNIT-4**

Lensing is directly connected to the emotional response of spectators. It is the lens that decides the image magnification, the depth of field, the area of coverage and the plane of focus.It is also the lens that helps us capture the subtle variations of light and textures. Students discover the artistic fundamentals of shot taking and Are taught how lensing is the most crucial aspect of mise-en-scene as well as shot break down.Lighting Lighting is different for diverse mediums and hence there are different lighting techniques for still photography, film and television. The parameters along with techniques of each are explained in detail.Students are taught to set up the shoots themselves and work on the textures of light. Students are given inputs in both indoor and outdoor lighting to enable



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them to respond to any kind of challenge in their professional life. Maya foundation nurbs modeling

Two objects

#### **UNIT-5**

Videography When the image is acquired electronically, instead of the usual optical process then it is called videography. Students are taught the nitty gritty of how video signals are generated, amplified and recorded. They are also brought into contact with information about the various formats and resolutions in which video exists today. Apart from inputs in DV CAM, multicam setups, they are also given input into high end cameras like Red and various other HD cameras capable of 2k (film) resolution and the knowledge of 2k film transfer. Shooting for Chroma Whenever it is found necessary to create a composite shot using two or more separate shots, the techniques of keying, matting and frame blending are used. Students are taught how to light up green/blue screens meant for chroma key effects and also give in inputs about matting and blending techniques.

Maya foundation polygon basics- theory Maya foundation polygon modling Modeling an interior or cartoon character

#### **Reference Book**

**Book 1. Body Language: Advanced 3D Character Rigging** By. Eric Allen, Kelly L. Murdock, Jared Fong, Adam G. Sidwell.

**Book 2. Acting for Animators** By. Ed Hooks .



**Animation Design and Theory- MSCAN 302**

Study of Animation Techniques & styles developed and used over the years in animation. Appreciating the difference between the processes of the basic 3 methods of animation, namely frame by frame creation of animation (like traditional 2D) • modification of object or image to produce animation. (like paint on glass, sand on glass, simple claymation without armatures etc) manipulation of objects to produce animation. • (like 2Dcutout animation, 3Dclaymation with armatures, simple object animation, Puppets, etc) Exploring & developing the animation world based on the technique you might choose for animation. The Digital World and the avenues opened by it in terms of animation design.

**Animation articulation and performance**

Understanding the role of drama and acting in creating convincing characterization and emotion  
Creating believability by taking off on the natural, making objects behave in character  
Expressing attitude, gesture, body language • Role playing through actual and mental miming •  
Character acting, reacting, take • Expressing exaggeration through caricatured matter acted upon by caricatured forces

**Character Animation**

Reflecting on human movement • Gaining an insight into creating believable action •  
Practicing the mechanics of biped • walks, runs, head turns, gestures Methods of lip-syncing to sound breakdowns • Posing characters in scenes

**Animal movement**

Reflecting on animal movement • Gaining an insight into creating believable action •





Practicing the mechanics of quadruped- walks, • runs, gallops; bird movement and flight

## **Sfx**

An awareness of and an ability to • create convincing atmosphere Creating animated environments and • atmosphere like flames, smoke, water, rain, snow etc. to offset principal animation  
Creating Special effects such as • explosions, speed lines etc.

## **Theory**

Understanding contemporary trends in • animation making in terms of content, styling, techniques and applications Studying animation films through film viewing, • appreciation, criticism, theoretical writings, essays , research studies Aesthetics: Introduction to Aesthetics • (Indian and Western) Introduction to major art movements • Narrative: Introduction to narrative • structures (Indian and Western) Modes of Narrative • Narrative Discourse • Film Theory: Perception • Representation • Signification • Genres • Identification and Psychoanalysis • Interpretation

## **References:**

Ed Hooks, Acting for Animators • Heinemann, Reed Elsevier, 2000 The Human Figure in • Motion, Dover Publication Inc., NY, 1995 Richard William, The Animators Survival Kit, • Faber and Faber, New York, London, 2002 David Choquet, 1000 Game Heroes, Taschen. 2002 • Eadweard Muybridg, Animals in Motion, • Dover Publication Inc., NY, 1957 Alan Cholodenko (edited by), The Illusion of Life- • Essays on Animation Power, Publication in association with Australian Film Commission, SYD, 1991 Eric Smoodin (edited by), Disney Discourse – Producing • the Magic Kingdom Routledge, London, 1994 Jay Leyda (edited by), Eisenstein on Disney • Seagull Books, Calcutta, 1986 Ernest Pintoff, Animation 101, Michael • Wiese Productions, CA, 1999

## **Animation Scripting and Methods - MSCAN 303**

Experimenting with techniques for visual storytelling, • structure, story building, writing for animation Examining indigenous narratives, both contemporary • and traditional to gain an understanding of storytelling methods pertinent to our culture Creating dramatic flow, planning, pacing, sequencing, • organizing visual flow and continuity in storyboards Co-ordinating character, scene length, pace of action • Choreographing scene change and camera movement •

Planning, examining, analyzing and • pacing character behaviour An exposure to various animation techniques • Workshops using both 2D and 3D techniques • on Computer, Film, Video etc.

Production of professional stop-motion • animation puppet and usable set props. Understanding how a stop-motion • animation production works Sculpting, mould making, armature • construction and casting techniques. Methods to fabricate a stop-motion animation puppet • Techniques for set construction. • Doping, animating, lighting and shooting • Post production techniques •

## **References for Methods**

Robert Russett and Cecile Starr, Experimental Animation, • Origins of a New Art A Da Capo Paperback, NY, 1998 Peter Lord and Brian Sibley, Cracking Animation –The • Aardman book of 3D Animation, Thames & Hudson, 2000 Richard Taylor, Encyclopedia of Animation • Techniques, Book Sales, 2004 Michael Frierson, Clay Animation: American Highlights • 1908 to Present, Twayne Publishers, 1994 Chris Patmore; The Complete Animation Course: The • Principles, Practice, and



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Techniques of Successful Animation, Barron's Educational Series, 2003 Frank Thompson, The Making of The Nightmare • Before Christmas, Disney Editions, 2002 Peter Lord and Brian Sibley, Cracking Animation –The • Aardman book of 3DAnimation, Thames & Hudson, 2000

## References for scripting

Marilyn Webber, Gardner's Guide to Feature • Animation Writing: The Writer's Road Map Garth Gardner Company, 2002 Jeffrey Scott, How to Write for • Animation, Overlook Press, 2002

Marilyn Webber, Gardner's Guide to Animation • Scriptwriting: The Writer's Road Map, Garth Gardner Company, 2002 • Jean Ann Wright, Animation Writing and • Development: From Script Development to Pitch (Focal Press Visual Effects and • Animation), Focal Press, 2005

## Sound and Camera - MSCAN 304

### UNIT-1

Understanding the dynamics of sound • design and use of sound as a key component of animation • Designing a sound track for animation including

### UNIT-2

• music, dialogue, voice overs, lip synch and FX Recording and mixing multiple tracks • Post processing sound

### UNIT-3

• Understanding the dynamics of camera • moves and magnifications Experimenting with camera techniques

### UNIT-4

• working directly under camera Using registration fields, table moves

### UNIT-5

• peg movements

### References



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Mascelli Joseph V, The Five C's of • Cinematography: Motion Pictures Filming Techniques, Silman-James Press, 1998 Daniel Arijon, Film Technique, Silman-James Press, 1991 •  
David Sonnensch, Sound Design: The Expressive • Power of Music, Voice and Sound Effects in Cinema, Michael Wiese Productions, 2001 David Lewis Yewdall, Practical Art of Motion Picture • Sound, Second Edition Focal Press, 2003 Tomlinson Holman, Sound for Film and • Television, Second Edition Focal Press, 2001

## Practical - Computer for Animation - MSCAN 305

To enlarge the repertoire of tools to create animation

- An experience of working across varied
- Animation Software like Maya, Animo, 3DStudio Max, Flash etc.

### References

Dan Ablan, Digital Cinematography & • Directing, New Riders Press, 2002

Jeremy Birn, Digital Lighting & Rendering, • New Riders Press, 2000

Owen Demers, Digital Texturing & • Painting, New Riders Press, 2001

Glenn Kirkpatrick, Flash Cartoon Animation: Learn • from the Pros, A-Press, 2003



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**Practical – Anatomy and Drawing - MSCAN 306**

Understanding of the relationship of bones and • muscles at rest and in movement to be able to translate this to creating and maintaining correct volumes Studying human and animal movement through • sequential drawings, gesture drawing

**References**

Victor Perard, Anatomy and Drawing, • Dover Publications Inc., NY, 2004

Steve Roberts, Character Animation in 3D: Use • traditional drawing techniques to produce stunning CGI animation, Focal Press, 2004

Christopher Hart, Drawing Cutting Edge • Anatomy: The Ultimate Reference for Comic,



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Watson-Guptill Book Artists Publications, 2004•

Eadweard Muybridge, Animals in Motion, • Dover Publication Inc., NY, 1957

Eadweard Muybridge, The Human Figure in • Motion, Dover Publication Inc., NY, 1995

**Representation Techniques For Animation.- MSCAN 401**

**Unit - 1**

- Different techniques of representations for animation. •

**Unit - 2**

- Experiment with different methods of representation

**Unit - 3**



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- Exploring different skills,

## **Unit - 4**

- tools

## **Unit - 5**

- medias to represent for animation.

## **References**

George.B.Bridgman, The Book of a Hundred • Hands, Dover Publication Inc., NY, 1972

Richard Taylor , Encyclopedia of Animation • Techniques, Book Sales, 2004

Robert Russett, Experimental Animation: Origins • of a New Art Cecile Starr (Editor), Capo, 1988

Alan Watt, M. Advanced Animation and Rendering • Techniques Watt, Addison-Wesley Professional, 1992

<b>Cartoon Animation- MSCAN 402</b>
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## **Unit- 1**

- Character Developer

## **Unit- 2**



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- Visualization

## **Unit- 3**

- Visualization of Different Views.

## **Unit- 4**

- How to Draw Expressions.

## **Unit- 5**

- How to achieve lip synchronization

<b>Multimedia Networks - MSCAN 403</b>
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**OBJECTIVE:** This course provides knowledge about computer network related hardware and software using a layered architecture.



## **UNIT – 1**

### **1. ApplicationLayer:**

World Wide Web (WWW), Domain Name System (DNS), E-mail, File Transfer Protocol (FTP), Introduction to Network security, Electronic mail in the internet, DNS-The internet directory service,Peer to Peer Application

## **UNIT – 2**

### **2. TransportLayer:**

Elements of transport protocols: addressing, connection establishment and release, flow control and buffering, multiplexing and de-multiplexing, crash recovery, introduction to TCP/UDP protocols and their comparison, Principle of Reliable data Transfer (Building a Reliable data Transfer protocol,Pipelined Reliable data transfer Protocol)

## **UNIT – 3**

### **3. Data Link Layerand Physical Layer:**

Design issues, Framing, Error detection and correction codes: checksum, CRC, hamming code, Data link protocols for noisy and noiseless channels, Sliding Window Protocols: Stop & Wait ARQ Concept of Analog & Digital Signal, Bandwidth, Transmission Impairments: Attenuation, Distortion,Noise.

## **UNIT – 4**

### **4. IntroductiontoComputerNetworks and Network Layer:**

Data Communication System and its components, Data Flow, Computer network and its goals, Types of computer networks: LAN, MAN, WAN, Wireless and wired networks, broadcast and point to point networks, Network topologies.

## **UNIT – 5**

5.Network software: concept of layers, protocols, interfaces and services, Introduction of forwarding and Routing , Routing Algorithms.

### **Suggested Readings/Books:**

1. James F. Kurose and Keith W. Ross, “Computer Networks: A Top to Down Approach”, 6th Edition.
2. Larry L. Peterson and Bruce S, “Computer Networks: A System Approach”





**OBJECTIVE:** To understand the history of world art and its movement that shaped humanity. A deeper appreciation for art and the benefits of artistic expression, this subject will guide students to the abundant resources focusing on art appreciation and art history.

**THEORY**

**UNIT – I**

Prehistoric Art: Paleolithic, Mesolithic, Neolithic

Ancient Near East: Mesopotamian, Sumerian, Akkadian, Neo-Sumerian, Babylonian, Assyrian, Neo-Babylonian, Persian. Egyptian Art: Old Kingdom, Middle Kingdom, New Kingdom.

**UNIT – II**

Greek Art: Minoan, Mycenaean, Greek Roman Art: Republican Rome, Imperial Rome Byzantine Art: Byzantine Art in Early Europe: Celtic, Iron-Age Europe

**UNIT – III**

Islamic Art: Islamic, Abbasid, Ghaznavids, Ayyubid, Fatimid, Nasrid, Mughal, Safavid, Ottoman Early Medieval Art: Early Medieval, Romanesque Gothic Art, Manuscripts Renaissance Art in Italy: Italo-Byzantine, Early Renaissance, High Renaissance

**UNIT – IV**

Renaissance Art Outside Italy: Northern Renaissance Baroque Art: Baroque 18th-Century Art: Late Baroque, Rococo, Romanticism 19th-Century Art: Romanticism, Neo-Classicism, Realism, Pre-Raphaelites, Realism, Impressionism, Post-Impressionism, Neo-Impressionism, Pointillism, Symbolism, Art Nouveau

**UNIT – V**

20th-Century Art: Expressionism, Cubism, Futurism, Dada, Surrealism, Abstract Expressionism, Pop Art, Op Art, Minimalism, Performance Art, Environmental Art, Neo-Expressionism, Post-modernism.

**References**

A world history of Art (17th Edition) - Hugh Honour Leonardo Da Vinci 2 Vol set Michaelangelo Life and Work - Frank Zollner



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**MAYA Practical - MSCAN 405**

**Project- MAYA\_**– Any 3D model and 3D animated fur, animating fur, Changing attributes.



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**Animation Technology - MSCAN 406**

An exposure to the latest that technology has to offer • when it comes to applications in the filed of animation. student will be kept abreast with innovative and • ground breaking techniques adapted/invented which have pioneered the process of animation. Simulation (Environments etc.)• Crowd Control• MOCAP (Motion Capture)• VR(Virtual-reality)• Rendering Technologies• Digital Lighting• Compositing Techniques• Effects - reflections, refractions, global • illumination and caustics.Motion Building• Alternative Modelling Methods – eg.: Luxology Modo, • CLOTHFX• Studio visits•