

MAT.O3.R0 : - Multimedia Processing Techniques

Detailed Syllabus

- 1. Introduction:** **02 Hrs.**
Definition of Image, Raster Graphics, Vector Graphics, Digital Image Representation, Bit allocation for intensity range.
- 2. Digital representation of Color:** **02Hrs.**
Basic Color Models (RGB, CMYK, HSV) and their use Color Characteristics, Color Palette, Monitor vs Print Display.
- 3. Image Capture:** **02Hrs.**
Exposure, aperture, field of view, resolution, focal length
- 4. Scanning:** **02Hrs.**
Basic principles of image and slide scanning
- 5. Image Processing:** **04Hrs.**
Thresholding, Intensity histogram, histogram manipulation for image enhancement, Basic low pass, high pass, Filters: median filtering, Layer, Image Manipulation (cropping, scaling, rotation), Bitmap image editing;
- 6. Scalable Vector Graphics (SVG):** **02 Hrs.**
Introduction, Why SVG, use of SVG in HTML, SVG elements, SVG shapes, filters, effects, gradients-linear and nonlinear
- 7. Introduction to MIDI:** **02 Hrs.**
Definition, MIDI Interfaces, MIDI Instruments, MIDI file structures, MIDI file formats
- 8. Image Editing: (Photoshop as reference software tool)** **20 Hrs**
8.1) Masks and Channels:

Working with masks and channels, Creating a quick mask, Editing a quick mask, Saving a selection as a mask, Editing a mask, Loading a mask as a selection and applying effects, Creating a gradient mask, Loading the gradient mask as a selection and applying effects.

8.2) Retouching and Repairing:

Using the Clone Stamp tool for repair, Using the Pattern Stamp tool to create, Using the Healing Brush and Healing Patch to repair flaws, History palette and snapshots.

8.3) Painting and Editing:

Using the Photoshop paint engine, Using blending modes, Painting shadows and highlights, Smoothing the edges of strokes, Using the History Brush and the Art History Brush, Brush palette, Painting with specialty brushes, Using the Color and Swatch palettes, Adding brush libraries, Saving customized preset brushes, Image and canvas size, Creating and painting with custom brushes, Pattern Maker filter.

8.4) Basic Pen Tool Techniques:

Drawing paths with the pen tool, Drawing straight paths, Drawing curved paths, Combining straight and curved lines, Drawing a path around artwork, Using keyboard shortcuts.

8.5) Creating Special Effects:

Automating multi-step tasks; Playing and batch-playing actions, Using guides, Saving and loading a selection, Hand-coloring selections on a layer, Combining and moving selections, Colorizing a selection, Adjusting color balance, Applying filters, Creating a cutout effect, Improving performance with filters.

9. Image and Graphic Pattern Generation:

(Adobe Illustrator & Indesign as reference software tool)

10Hrs.

9.1) Creating Basic Shapes:

Setting up the document, Using the tools, Drawing shapes, Painting artwork, Copying & scaling shapes, Painting, Filling with color, Stroking with color, Building a custom palette, Copying paint attributes, Saturating colors, Painting with patterns and gradients, Painting with a pattern brush, Drawing with the Pen, Drawing straight lines, Drawing curves, Editing curves.

9.2) Working with Brushes:

Using the Art Brushes, Using Scatter Brushes, Changing the color attributes of brushes, Using a fill color with brushes, Using Calligraphic brushes, Using Pattern brushes, Using Pattern brushes, Creating brushes.

9.3) Transforming Objects:

Scaling objects, Rotating objects, Distorting objects, Changing the perspective, Using the Free Transform tool, Making multiple transformations.

9.4) Blending Shapes and Colors:

Creating a gradient fill, Adjusting the direction of the gradient blend, Adding colors to a gradient, Creating smooth-color blends, Blending intermediate steps, Modifying the blend, Combining blends with gradients, Creating Shapes with the Pathfinder, Uniting shapes, Removing shapes to create a new object, Intersecting objects, Trimming objects, Blending colors with the Soft Mix command, Blending colors with the Hard Mix command, Dividing shapes with the Divide command.

9.5) Creating Layers:

Moving objects and layers, Locking layers, Viewing layers, Pasting layers, Merging layers.

9.6) Creating Watercolor or Airbrush Effects:

Setting Smart Guide preferences, Painting with the gradient mesh tool, Specifying the number of mesh lines, Applying colors to the mesh, Highlighting a mesh object, Editing mesh points, Reflecting mesh objects, Modifying mesh lines.

9.7) Drawing Cylinders and Boxes:

Drawing three-dimensional objects, Drawing Cylinders, Drawing boxes.

9.8) Printing Artwork & Producing Color Separations:

Overview of printing, Color management, Printing B&W proofs, Document info command, Creating Color separations, Working with two-color illustrations, Creating a trap, Overprinting objects, Combining Photoshop & Illustrator, Vector vs. bitmap, Placing a Photoshop file, Copying a placed image, Adjusting color in a placed image, Masking an image, Sampling colors in placed images, Replacing a placed image.

9.9) Preparing Graphics for Web Publication:

Optimizing images for the Web, Exporting flat-color artwork, Exporting continuous- tone and gradient artwork, Linking objects in an image map to URL's.

10. Sound Editing: (Sonic Soundforge as reference software tool) 06 Hrs

Introduction to Sound editing software, Working with existing sound files, Editing sound files, adding effect, Recording sound clips, Dubbing.

11. Video Editing: (Adobe Premier as reference software tool) 08 Hrs

Introduction to video editing tools, Importing and capturing projects, working with clips, Editing techniques, Transitions, Video Effects.

Laboratory experiments:

Image Editing: Selection, painting and transformation tools, Layers, Channels, Masks, Anti-aliasing, Dithering, Filters

Sound Editing: Normalising, Mixing, Cross-fading, Dynamics, Filters, Mono/ stereo formats, Noise Gate

Video Editing: Importing Clips, trimming clips, splitting clips, manipulating audio content, adding transitions, changing the speed of a clip, changing opacity, applying special effects, superimposing an image, exporting a movie

Multimedia processing using tools such as Adobe Photoshop, Adobe illustrator, Adobe Premier/ Final Cut-Pro, Adobe InDesign and Sonic Soundforge, advanced features of MS Powerpoint, Publisher, Corel Tools.

MAIN READING

1. Tay Vaughan, "Multimedia making it work", Tata McGraw-Hill, 2008.
2. Rajneesh Aggarwal & B. B Tiwari, "Multimedia Systems", Excel Publication, New Delhi, 2007.
3. Li & Drew, "Fundamentals of Multimedia" , Pearson Education, 2009.

SUPPLEMENTARY READING

1. Parekh Ranjan, "Principles of Multimedia", Tata McGraw-Hill, 2007
2. Anirban Mukhopadhyay and Arup Chattopadhyay, "Introduction to Computer Graphics and Multimedia", Second Edition, Vikas Publishing House.