

**PG Diploma in Multimedia and Web Technology (Distance Mode)
COURSE CURRICULUM**

SCHOOL OF EDUCATION TECHNOLOGY

First Semester

SL. No.	Code	Subject Name	Contacts Periods/Week		Credit	Marks	
			Theory	Practical		Theory	Sessional
1.	SETD-T-101	Elements of Graphic communication and Animation	3		3	100	
2.	SETD-T-102	Multimedia Technology	3		3	100	
3.	SETD-T-103	Multimedia Design Principles and Authoring	4		3	100	
4.	SETD-T-104	Computer Network and Web Technology	4		3	100	
5.	SETD-S-101	Multimedia Laboratory		4	3		100
6.	SETD-S-102	Project Assignment - I		4	3		100
Sub Total			14	8	18	400	200
Total			22			600	

Second Semester

SL. No.	Code	Subject Name	Contacts Periods/Week		Credit	Marks	
			Theory	Practical		Theory	Sessional
1.		Elective-I	3		3	100	
2.		Elective-II	3		3	100	
3.	SETD-S-201	Elective Laboratory		4	3		100
4.	SETD-S-202	Web authoring Laboratory		4	3		100
5.	SETD-S-203	Project Assignment-II		6	4		200
Sub Total			6	14	16	200	400
Total			20			600	

Elective Papers

Code	Subject Name	Contacts Periods/Week		Credit	Marks	
		Theory	Practical		Theory	Sessional
Elective - 1						
SETD -T-E-201	Dynamic Web Programming	3		3	100	
SETD -T-E-204	Animation	3		3	100	
Elective - 2						
SETD -T-E-202	Multimedia Programming	3		3	100	
SETD -T-E-203	Multimedia Authoring For Handheld Devices	3		3	100	
SETD -T-E-205	Nonlinear Digital Editing	3		3	100	

Syllabus

SETD-T-101: Elements of Graphic Communication and Animation

(4-0-0)

Elements of Graphic Communication:

Overview:

Use of Computer Graphics, Classification of application, Typical graphics resolution, Co-ordinate systems, Aspect ratio correction, Image processing and picture analysis, Interactive graphics, conceptual framework of Interactive graphics.

Output primitives :

Points and lines, line drawing algorithms, Circle generating algorithm, Ellipse generating algorithms, Parallel curves algorithms, Attributes of output primitives, Thick primitives, line style & pen style, character generation, Scan converting primitives and scan algorithm, Antialiasing, Filling algorithm, Making copy pixel, page Description Language.

Display technologies:

introduction, Raster Scan display system, Input devices for operation interaction. Colour printing principles.

Colour and shading:

Achromatic light, Chromatic light, colour Models for Raster Graphics, Reproducing Colours, Using Colour in Computer graphics, Rendering technique for line drawing & shaded images, Shading models for polygon, Surface details, Shadows, Transparency.

2D Transformations:

Basic transformations, Matrix representations and Homogeneous Co-ordinates, Composite transformations, other transformations.

2D viewing:

The Viewing Pipe-line, Viewing Co-ordinate reference frame, Window-to-Viewport co-ordinate transformation, 2-D Viewing functions, Clipping Operations, Structure concepts, Editing structure, Basic modelling concepts.

2D – Animation :

Overview:

Overview of computer based animation, Animation as a special effect,

Types of Animation:

Sprite & Rendered,

Basics of 2D modeling:

introduction, Creation of Static and Animated Materials, Keyframing and Animation Editing, Forward and Inverse Kinematics.

Special Effects :

Morphing, Warping, Splash, Blur etc.

Animation file formats

Tools for 2D – Animation.

SETD-T-102: Multimedia Technology

(4-0-0)

Introduction :

Evolution of Multimedia, Structure and Components of Multimedia. Multimedia Platforms, Application domains, Multimedia & interactivity.

Sound & Audio:

Basics of Acoustics :

Nature of sound waves, amplitude, frequency, waveform, Dynamic range of hearing, Characteristics of Musical Sound, Tone, Note, Intensity Pitch, Timbre.

Elementary Sound Systems :

Microphone (Principle of operation), Types of Microphones and their suitability of usage, Amplifier (working principles only), Loudspeaker (Types and Principle of operation).

Digitisation of Sound :

PCM, Sampling, Sampling rate, resolution, Bit rate, Quantisation error, Signal-to-Noise Ratio, Nyquist's Sampling Theory.

Electronic Music & Synthesizer:

MIDI Interface, Protocol & Data format.

Architecture of Sound card:

Processing of WAV and MIDI files:

Audio Compression Techniques :

Need for compression, DPCM, ADPCM, SBC, MPEG

Image & Graphics :

What is Image, Filtering, Image processing, Geometric transformation of images, Image composition, Mechanics for image storage.

Principles of Raster Graphics :

Computer Visual Display Concepts, Resolution, Colour & Pallets, Refresh rates and graphic accelerators.

Digital image representation and format:

Image processing & enhancement:

Image scanner principles:

File formats:

Digital still camera and photography:

Video Technology :

Analog Video :

Principles, Broadcast standards, CCD camera, Recording formats and standards.

Digital Video :

Principles, PC Video, Video conference standards, TV Cards, Frame Grabber Principles

IDTV and HDTV principles:

Motion Picture to Video Conversion:

Video Compression :

MPEG

Video Formats :

AVI and QuickTime

Video Editing:

Video editing concepts, conversion, transition, superposition.

Storage Media :

Introduction:

Magnetic media principles and storage density achievable

Disk Technology:

Evolution and basic principles of Compact Disk Technology – CD – DA and CD ROM. CD – DA format and details. CD – ROM format and principles

Writable Compact Disk :

WORM and Magneto – Optical disc principles.

Photo – CD

CD-ROM Production Process:

SETD-T-104: Computer Network and Web Technology

(4-0-0)

Introduction to Digital Communication

Introduction to Computer Networks :

Motivation for using computer networks, Point to Point and Peer to Peer Networks, Client Server Networks, Physical network topologies, ISO Layered Architecture, Geographical extent of Networks – LAN, MAN, WAN.

Introduction to Internet and World wide Web :

What is the Internet, Evolution of the Internet, How Internet Works (Packet Switching). Services Offered on the Internet : E-mail, Network News, Telnet, FTP, IRC, Archie, Gopher, WWW.
Internet Access Methods : Dial-up connection, Leased Line connection, ISDN
Internet Service Providers (ISP) : Connection through an ISP Server, Shell and PPP accounts.
What is the World Wide Web, Evolution of the WWW, Client-Server Model of the Internet.
Fundamental Concepts related to WWW : Browsers, Web Servers, Proxy Servers, Domain Name Servers, Hypertext, HTML, URL, HTTP, Home Page, Search Engines.

Network Concepts and TCP/IP :

Definition Network Protocol.

Network Components : Servers, Clients, NIC, Physical media (UTP, STP, Fiber-optic, Coaxial wireless communication etc.), Modems, Hubs, Repeaters, Bridges, Routers, Gateways.

Network Protocols : TCP/IP, NetBEUI, Layers of TCP/IP, *How TCP/IP Works* : The TCP level, The IP level, Datagrams, Octets, header Information. *IP Address* : Host and Network portions of IP address, Class-A Class-B Class-C Networks

Intranet & Internet

Client side technologies [Hypertext Markup Language (HTML): Structure of HTML Document - Meta tags, Links, Text, Lists, Tables, Inclusions (Objects, Images, and Multimedia contents), Forms, Frames, Image Maps; Style Sheets; JavaScript (Document Object Model, Object Reference - Objects, Methods and Properties, Event Handlers. Language constructs - Statements and Operators]; **Server side technologies** [Server Side Scripting (Working Principles, Implicit objects, Overview of Database Connectivity]; **Introduction to Extensible Markup Language (XML)**

SETD-T-103:Multimedia Design Principles and Authoring

(4-0-0)

Human Computer Interaction:

Introduction, Human factors, Fundamentals of Human perception, Human skill level and Behaviour, Dialogues and tasks.

Framework for HCI, Modelling Human Computer Interaction, Cognitive issues in user interface, Graphic Design and Style issues, Standard interface elements in windows.

Multimedia Document and Interchange formats :

Hypertext, HTML, MHEG and Hypermedia, SGML, Open Document Architecture (ODA), Open Media Framework Interface (OMFI)

Visual Design :

Introduction, Visual Rhetoric, Organising information, Factors designers consider when creating illustration and visual design, Designing for screen, Typography for computer screen, Spatial relationships in the interface, Symbols & Semiotics in the interface. Visual design methodology : (Clarity, Consistency, Appearance), Visual Coding, Layout Principles.

Cognitive aspect in Multimedia Presentation :

Cognitive domain of learning, Knowledge and Skill, Retention, Learning Style, Affective and Cognitive domain learning, Role of the creator of Multimedia learning material, Presentation format, Interactivity, System Quality, Media mix.

Authoring Metaphors :

Introduction, Definition & functions of Metaphors, Basic Categories - Slide show metaphor, Book metaphor, Windowing metaphor, Icon metaphor & Network metaphor.

Creating Scripts, flowcharts & Storyboards :

What are scripts, storyboards and flowcharts, Advantages of Storyboarding, Interactive Storyboarding, Simple interactive flowcharts, Complex interactive flowcharts, Writing scripts, Case studies.

SETD-S-101: Multimedia Laboratory

(0-0-4)

Vector Graphics:

Exercises for creation of objects like line, box, irregular shapes.

Exercises on rotation, transition, viewport, projection scaling of 2D-objects.

Bit-map Graphics

Exercises on editing, manipulation and enhancement using Photoshop or similar tools.

Exercises on filters and their effects, mode change and their effects.

Exercises on colourisation of a black and white picture.

Exercises on creation, rotation, translation, viewport, projection, scaling of 2D objects.

Creation of static 2D objects and simple animation

Exercise on Key-framing, Lighting, Rendering

Special Effects: Morphing, Splash, Blur etc.

Simple project in document presentation from given basic input and manuscript.

Using Internet & E-mail.

Hands-on experience on sound capture (from microphone and CD) and editing software tools like Sound Forge.

Restoration of old records.

Use of video camera & recorders.

Exercises on editing of Motion Video / animation clips using Adobe Premier

SETD-S-102: Project Assignment-I

(0-0-4)

Working on a short project involving text, graphics, audio & video editing, image enhancement and component integration.

Design & Development of a CD-ROM based multimedia presentation using an Authoring package (viz. Director).

Product development using Scripting Language viz. Lingo of Director

Animation using Scripting Language viz. Action script of Flash

SETD-S-201: Web Authoring Laboratory

(0-0-4)

Web authoring using HTML editors and Java script.

Use of DHTML, XML

Basic server side Coding

SETD-S-202: Elective laboratory

(0-0-4)

This lab is the supporting lab for Elective papers.

SETD-S-203: Project Assignment-II

(0-0-4)

Project Work

SETD-T- E-201: Dynamic Web Programming

(4-0-0)

Server side technologies [CGI, Server Side Scripting (Working Principles, Implicit objects, Session Handling, Database Connectivity, File Handling)]; **Extensible Markup Language (XML)** [Overview; Schemas-DTD (Document Type Definitions), XML Data, Namespaces, XSL, XSLT]; **Introduction to AJAX;**

SETD-T- E-202: Multimedia Programming

(0-0-4)

Advanced Features of Macromedia Director and its authoring language Lingo.

Scripting language of Macromedia Flash: Action Script.

SETD-T- E-203: Multimedia Authoring For Handheld Devices (4-0-0)

Wireless Access Protocol (WAP) and Wireless Markup Language (WML), Rudimentary ideas of modern telephone signaling --- the SS7 protocol, Short Message Service (SMS) and Multimedia Messaging Service (MMS), MMS details (MM1, MM2, MM4, etc, MMS authoring, MMS transport, etc.), Real-time Protocol and Real-time Control Protocol (RTP and RTCP), Streaming in 3rd generation mobile architecture, Experimenting with the (open source) ffmpeg suite and Live RTP stack, Voice and Video over IP --- Videophones (together, Media over IP), Session Initiation Protocol (SIP) and its use in Media Over IP. Skype as a case study, Multimedia Design Principles and Authoring for handheld devices, Application Development using Flash Lite

SETD-T-E-204 : Animation (4-0-0)

2D Animation

Case studies

3D Animation

Introduction: Identify the work area, Primitive Objects, Grouping & Mirroring, 3D Modeling.

Character Designing: Lights & Camera, Materials & Mapping, Keyframe animation, Time control, Animation modifiers.

Animation and Controllers: Animation controllers & Constraints, Rendering Animation, Creating hierarchies, Animating elements, Animation Helpers.

Understanding Nurbs:

Nurbs at sub object level, Nurbs Tool Palette.

Patch Modeling & Surface Tool: Patch Modeling & Surface Modifiers, Subdivision Surface

Advance concepts on Light, Material and Camera

Kinematics & Hierarchy: Inverse Kinematics, Helpers with IK

Introduction on Particle system & Space Warp

Utilities Panel: Dynamic Space Warp, Reactors, Motion Capture.

Introduction on Rendering: Basic Rendering, Rendering Elements, Network Rendering, Render Effects, Some concepts on video post.

SETD-T- E-205 : Nonlinear Digital Editing (4-0-0)

Digital Editing Fundamentals

Shooting and Editing Video

Editing Techniques

Rhythm, Motion, and Effects

Editing Sound

Titles, Output, and Compression

Case Studies

Nonlinear Editing

Outline:

Lesson 1: Digital Editing Fundamentals

Lesson One examines both the hows and the whys of digital video editing. You'll explore the main features in your NLE (non-linear editing program) and learn important foundation concepts every editor should know. The transition between analog and digital media is analyzed to give you a context for today's environment. Finally, you'll learn about the different stages in a digital editor's workflow. In a two-part project, you'll learn how to assemble multiple clips into a video sequence, and also edit down a commercial into a 30-second segment.

Lesson 2: Shooting and Editing Video

Lesson Two gives you a broader context for understanding how videos are produced (shot, captured, edited, and output). In the lecture you'll learn the basics of how directors set up and frame shots, exploring the impact of framing and camera angle, height, and distance on the viewer's perception of the sequence. You'll learn key terms that video editors use as well as creative concepts for your projects. In the exercise, you'll learn how to set up and shoot a short interview sequence, shooting both the interviewer and the interviewee, and edit together your clips into a coherent interview.

Lesson 3: Editing Techniques

Lesson Three examines the finer points of video modification, exploring techniques that can make or break the continuity between one shot and the next. You'll explore classic techniques for connecting shots such as graphic match, rhythm, movement, and spatial relation. A secondary focus will be on different ways in which editors compress time. Finally, you'll examine experimental techniques that break the rules of continuity editing. In the exercise, you'll take part in a collaborative editing project with your classmates, then shoot and edit a short narrative piece, learning how to work from a storyboard.

Lesson 4: Rhythm, Motion, and Effects

Lesson Four focuses on different techniques manipulating time, through rhythm, motion, and effects. You'll explore how overrunning and underrunning time—or slowing or speeding up motion—can influence the viewer's perception of time. You'll learn how editing programs alter the frame rate through interpolation and how transition effects and other visual effects can be used to communicate the passage of time and other changes from shot to shot. In the exercise, you'll explore these concepts (how else?) by modifying a short music video, syncing visual images to a soundtrack of your choice.

Lesson 5: Editing Sound

Lesson Five discusses an all-important aspect of the moving image: the soundtrack that accompanies it. The lesson explores the four elements that comprise any video soundtrack: the human voice, ambient sound (room tones), sound effects (foley), and music, defining their impact on the viewer. The qualitative aspects of sound are discussed—volume, loudness, pitch, and timbre—and you'll examine how the syncing and fidelity of sound affects the viewing experience. In the exercise, you'll explore all four aspects of a soundtrack by shooting and editing a video diary sequence.

Lesson 6: Titles, Output, and Compression

Ready for Cannes or Sundance? Lesson Six provides pointers on polishing and publishing your work. You'll explore such final touches as adding the introductory title and/or text graphics to your video. You'll also take a look at file compression and formats for output so you can start showing off your projects. The final class project will be to create a title sequence using text and type tools.