M4.2-R4: INTRODUCTION TO MULTIMEDIA

Objective of the Course

This course aims to introduce the fundamental elements of multimedia. It will provide an understanding of the fundamental elements in multimedia. The emphasis will be on learning the representations, perceptions and applications of multimedia. Software skills and hands on work on digital media will also be emphasized. On completion of the subject, the students will understand the technologies behind multimedia applications and master the skills for developing multimedia projects. After successfully completing the module student should be able to:
   • Summarize the key concepts in current multimedia technology.
   • Create quality multimedia software titles.

Outline of Course

S. No.	Topic	Minimum number of hours
1.	Introduction to Multimedia	08
2.	Computer Fonts and Hypertext	10
3.	Audio fundamentals and representations	10
4.	Image Fundamentals and representations	10
5.	Video and Animation	10
6.	Multimedia Authoring	12

Lectures	**=**	**60**	
Practical/tutorials	**=**	**60**	
Total	**=**	**120**	

Detailed Syllabus

1. Introduction to Multimedia   **08Hrs.**
What is multimedia, Components of multimedia, Web and Internet multimedia applications, Transition from conventional media to digital media.

2. Computer Fonts and Hypertext   **10 Hrs.**
Usage o f text in Multimedia, Families and faces of fonts, outline fonts, bitmap fonts International character sets and hypertext, Digital fonts techniques.

3. Audio fundamentals and representations   **10 Hrs.**
Digitization of sound, frequency and bandwidth, decibel system, data rate, audio file format, Sound synthesis, MIDI, wavetable, Compression and transmission of audio on Internet, Adding sound to your multimedia project, Audio software and hardware.

4. Image fundamentals and representations   **10 Hrs.**
Colour Science , Colour, Colour Models, Colour palettes, Dithering, 2D Graphics, Image Compression and File Formats :GIF, JPEG, JPEG 2000, PNG, TIFF, EXIF, PS, PDF, Basic Image Processing [Can Use Photoshop], Use of image editing software, White balance correction, Dynamic range correction, Gamma correction, Photo Retouching.

5. Video and Animation   10 Hrs.

Video Basics , How Video Works, Broadcast Video Standards, Analog video, Digital video, Video Recording and Tape formats, Shooting and Editing Video (Use Adobe Premier for editing), Video Compression and File Formats. Video compression based on motion compensation, MPEG-1, MPEG-2, MPEG-4, MPEG-7, MPEG-21, Animation: Cell Animation, Computer Animation, Morphing.

6. Multimedia Authoring   12 Hrs.

Multimedia Authoring Basics, Some Authoring Tools, Macromedia Director & Flash.

Note: The aim of the syllabus is to provide orientation as regard to uses of Multimedia. Practical Assignments may be handled using Multimedia tools, such as Flash, Dreamweaver, Photoshop etc. or any other open source multimedia tools.

RECOMMENDED BOOKS

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.

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Model Question Paper

NOTE:

1.	There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
2.	**PART ONE** is to be answered in the **TEAR-OFF ANSWER SHEET** only, attached to the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book.
3.	Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the answer sheet for **PART ONE** is returned. However, candidates, who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the answer sheet for **PART ONE**.

TOTAL TIME: 3 HOURS   **TOTAL MARKS: 100**
(PART ONE - 40; PART TWO - 60)

PART ONE
(Answer ALL Questions; each question carries ONE mark)

1.   Each question below gives a multiple choices of answers. Choose the most appropriate one.

1.1   _____ refers to any type of application or presentation that involves more than one type of media, such as text, graphics, video, animation, and sound.
a) An executable file
b) Desktop publishing
c) Multimedia
d) Hypertext

1.2   Which of the following is the advantage of using MIDI over digital audio?
I.   Consistency in audio quality
II.   Compatibility
III.   Processor speed requirements
IV.   File size

a) I, II, III
b) I, III, IV
c) II, III, IV
d) I, II, III, IV

1.3   Hypertext is
a) used to link document
b) a search engine
c) includes sound and video
d) requires plug-in to be view by a browser

1.4   _____ is used to compress images.
a) MPEG

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b) JPEG
c) either a or b
d) none of the above

1.5 _____ audio/video refers to on-demand requests for compressed audio/video files.
a) Streaming live
b) Streaming stored
c) Interactive
d) none of the above

1.6 You are preparing a multimedia presentation to be posted on your organization's website. You want to include images that you have gathered from the internet. What legal restriction must you consider before including these images?
a) Copyright
b) Relevance
c) Resolution
d) size

1.7 Which one of these is a video file
a) frogs.avi
b) horse.jpg
c) cat.mp3
d) All of the above

1.8 Authoring tools help you:
a) Write a storyboard
b) Search the Internet
c) Control the presentation of multimedia elements
d) All of the above

1.9 Which of the following is a common sans serif font?

a) Arial
b) Courier
c) Times
d) All of the above

1.10 A multimedia project is said to be _____ when users are NOT given navigational control.
a) Hypertext
b) Linear
c) Nonlinear
d) Plug-in

2. Each statement below is either TRUE or FALSE. Identify and mark them accordingly in the answer book.

Tweening is the process of animating an object over a line or path that can be straight, jagged, or curved.

MIDI (Musical Instrument Digital Interface) is used by the multimedia computer to produce the music.

Animation is used to create movements on the screen.

On the Internet, only hypertext hyperlinks are hot.

Text can be developed using authoring software

JPEG and MPEG are file compression program standards.

Scrolling text make difficult to incorporate small blocks.

Animation can be used to emphasize the three-dimensional nature of objects.

Most commonly used format for graphics is .BMP or bitmap pictures.

If the sequence and timing of these multimedia elements can be controlled by the user, then one can name it as Non-Interactive Multimedia.

3.   Match words and phrases in column X with the nearest in meaning in column Y.

	X	Y
3.1	dots on the screen arranged in rows.	Clip Art
3.2	The creation of motion from still pictures	ASCII
3.3	Previously drawn images that artists can legally use in their own work	Authoring Software
3.4	Computer-generated worlds that created the illusion of immersion	GUI
3.5	A motion picture compression system.	Video Conferencing
3.6	standard character set for text files	Pixels
3.7	programs used to create full, multimedia productions, such as simulations and tutorials	MPEG
3.8	A computer interface using point-and-click mouse actions	Virtual worlds
3.9	transporting real-time voice and video over telecommunications services	Animation
3.10		

4. Fill in the blanks in 4.1 to 4.10 below, by choosing appropriate words and phrases given in the list below:

(a) Non-sequential	(b) Morphing	(c) digitized	(d) lossless	(e) RAM
(f) Virtual reality	(g) 256	(h) Resolution	(i) pixels	(j) Burning

4.1   The clarity of a monitor is known as _____.

4.2   When a program assigns 8 bits to a pixel, that pixel can display one of up to _____ colors.

4.3   When sound is digitally recorded, it is said to be _____

4.4   When a video clip merges and transforms into another image it is known as _____.

4.5   The process of copying files to a CD is known as _____

4.6   Historically, the term "hypertext" was used when textual information was linked in _____ ways.

4.7   When using a(n) _____ compression system, a file can be compressed and decompressed without loss of data.

4.8   When a digital image is currently being viewed on a computer screen, it is actively loaded into _____.

4.9   A simulated experience generated by computer, like visiting the surface of the sun or experiencing life inside a human blood cell, is called ____.

4.10 A _____ is a single point in a graphic image.

PART TWO
(Answer ANY FOUR questions)

5.

a. What issues of functionality need to be provided in order to effectively use a wide variety of media in Multimedia applications? Your answer should briefly address how such functionality can facilitated in general Multimedia applications.

b. What is meant by the terms Multimedia and Hypermedia? Distinguish   between these two concepts

(9+6)

6.

a. Explain the use of the following hardware components in multimedia.

(i) Scanner (ii) Soundcard

b. Interactivity is among the most important feature in any multimedia applications. What is interactivity and briefly explain what makes an application interactive?

c. What key issues or problems does a multimedia system have to deal with when handling multimedia data?

(5+5+5)

7.

a. What is the mechanism of digitized sound? How does the computer reconstruct sound wave from a sample data?

b. What is the advantage of MIDI over digitized sound?

c. Explain the concept of video on multimedia.

(5+5+5)

8.

a. What causes sound? How is sound recorded digitally?

b. Why is data compression necessary for Multimedia activities? What is the distinction between lossless and lossy compression? What broad types of multimedia data are each most suited to?

(5+5+5)

9.

a. What are the 3 characteristics of color? What kind of color does a computer display.

b. What is animation? Explain the concept of key frames in designing animations.

c.   What are the key issues that need to be addressed for designing web based multimedia applications?

(5+5+5)

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Assignment 1.

Create an application in HTML to design the following page :

DOEACC Society	
- DOEACC Courses - Syllabus - Duration - Examinations - Minimum Qualifications - New Batches - Feedbacks	DOEACC Society is an autonomous body under Govt. of India………………

The application should allow the user to display information that lets the students to know about :
   a)   the various DOEACC courses and the syllabus
   b)   minimum qualification required
   c)   contents and duration of courses
   d)   examinations held.
   e)   information about new batches

The students should also be able to submit the feedback forms. Provide links to information pages. The heading should be in a larger font, bold, underline, blue color and set as a marquee appearance. Apply the following formats to the left frame :

   a)   Apply unordered list with hyperlinks
   b)   Font type : Monotype Corsiva
   c)   Font Size : 18, Font Color :Red

Assignment 2.

Create an application in HTML using forms that lets the users to fill-in their personal information/resume and submit the same.

Assignment 3.

Create a simple animation (for eg: an animated face showing the movements of eyes and a smiling face) by using Macromedia Flash. Use the various Flash techniques such as :

a) drawing tools to represent the facial features
b) motion guides
c) motion and shape tweens to animate the movements of the face
d) button symbols to start and stop animation
e) basic action scripts to handle the events.

Assignment 4.

Using the previous exercise controls, also import a sound file to provide a musical soundtrack while the movie plays. After testing the movie, publish it for playback by others, either through a browser or directly with Flash Player.

Assignment 5.

Create a scene to show the effects of morphing by changing a running tiger into the image of a motor bike. Use different keyframes to show the image of a tiger in the first frame and a motor bike in the last frame.

Assignment 6.

Create a rolling ball using Photoshop by using the concept of layers. Place some white text on this layer at the center of the image. Sphererize the text and show the effects.

Assignment 7.

Enhance the image described above to create a bouncing ball.

Assignment 8.

A mask is a special type of layer that lets you reveal selected parts of another layer, Create a mask to show the following features :

a) people walking around inside a house,
b) they should be visible when they pass by a window, but invisible otherwise.
c) Use masking techniques to create a spotlight or showing pictures behind images.

Assignment 9.

Create an application to create an animated scene where
a) a person is being chased by some animal
b) use the concept of layers consisting of
   i)   a background image,
   ii)   a series of images of a running man and
   iii)   a series of images of a running animal.
c) Integrate the layers to generate the effect of an animated scene.

Assignment 10.

Frames define increments on the Timeline and Keyframes are special frames to define any change in animation. Create an application to move an object eg : a shape, text or a symbol along any path created with the Flash drawing tools.

Assignment 11.

Create different layers to show the effects of morphing by changing a sapling budding into a tree. Use different keyframes to show the image of a sapling in the first frame and a tree in the last frame.

Assignment 12.

A Symbol is a graphic, button, or movie clip you create once and can use any number of times in the application. Any symbol created is automatically placed in a storage area called the library for current document. Create a symbol as a logo for your company that can be stored in a library for a Flash document as a reusable object.

Assignment 13.

Illustrate with the help of an application to create text effects with filters.

Assignment 14.

With the help of an application, list the set of actions to import images to the stage as well as to the library.

Assignment 15.

Create an application illustrating a running animal from one place to another. The image should fade away as the animal moves away from the location of sight.
   a)   specify the path of movement of animal
   b)   set the keyframes for the motion tween.
   c)   create transitions effects,
   d)   set the starting position of the object.
   e)   add multiple effects such as changing size or fading to make the object appear to grow or fade-in while it enters or fade-out and shrink as it exits.

Assignment 16.

Create an application in Flash using Text tool for creating and setting the type of text. Create a text "COMPUTER" and also draw two buttons with the functionality to grow and shrink the created text size as the user clicks the respective buttons.

Assignment 17.

A Timeline is where you control the images and sounds in the Flash documents. The Timeline is divided into frames. Create an application in Flash to demonstrate the Timeline effects for changing text, shapes and symbols.

Assignment 18.

Create an application in Photoshop to illustrate the basic Image processing techniques.

Assignment 19.

Illustrate the effect of growing and shrinking text with the help of two buttons.

Assignment 20.

Create an animated button symbol as a reusable object that can be stored in a library for a Flash document.

Assignment 21.

Illustrate the series of actions to convert an existing object such as a company picture to a symbol.

Assignment 22.

Using Shape tween, convert a square to a triangle. Use different keyframes to show the image of a square and a rectangle.

Assignment 23.

Show the effect of a flying parachute with the help of animation and motion guides.

Assignment 24.

Create an animated graphic symbol eg: an animated rollover button. Add a movie clip to be played on the button surface. Also add the timeline to show animation effects.

Assignment 25.

Illustrate with a sequence of steps publishing a movie for others to view. Publish a movie that will display on a web page.