



Introduction

to

Multimedia



**FIREWALL
MEDIA**

RAMESH BANGIA

Introduction to Multimedia

Introduction to Multimedia

M4.2 - R4

STRICTLY AS PER NEW DOEACC SYLLABUS

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INTRODUCTION TO MULTIMEDIA

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Preface

The new syllabus of DOE's various levels of courses, popularly called O-level, A-level, B-level and C-level is out. Keeping in mind the various developments taking place around the world in the field of computers, these syllabus include most of them. While keeping in mind the level of students studying the various levels, the degree of difficulties of the syllabus have been very well designed. I hope that after the new syllabus the courses would be as popular as they were before.

There had been a long struggle between Training Institutes and Government Organizations, since these organizations would not recognize the degree/diploma given by them. Students passing out from these institutions were not given jobs based upon the said diplomas/degrees. Ultimately, the Government formed a society under the Department of Electronics, called DOEACC, who conducts tests and gives grades to the students irrespective of the institutes where they have studied. It is also possible to give the test without having any proper institutional studies. This is more or less on the terms of SAT and GRE conducted by USA. The only difference is that this is not online. There are fixed dates for the exams.

The course for this has been designed for students to appear in the exams at various levels. These levels are O-level, A-level, B-level, C-level. The most popular among these is the O-level, since it is the entry level. Once you have cleared the O-level, you are eligible for a government job. Each course has been divided into various modules. Various books are available for various modules. This book is also made for you to prepare for the O-level course.

This book has been written totally in accordance with the syllabus provided. Each chapter has been embedded with the screen shots for you to know what to expect on the screen, while running the application. Each chapter contains examples which can be attempted to supplement the reading. At the end of the chapter, there is a thorough revision of the text read. Not to mention of the questions provided in the beginning, both in the form of objective and subjective. The book also contains Sample papers which are based on the samples provided by DOEACC society. These would help you in preparing for the exams.

Author

SYLLABUS

M4.2-R4: INTRODUCTION TO MULTIMEDIA

Outline of Course

<i>S.No.</i>	<i>Topic</i>	<i>Minimum No. of Hours</i>
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
	Practicals/Tutorials	= 60
	Total	= 120

DETAILED SYLLABUS

- 1. Introduction to Multimedia** **08 Hrs.**
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 of 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 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, 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, Micromedia Director and Flash.

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1.1 WHAT IS MULTIMEDIA?

First thing first, let us understand what Multimedia means. Multi means many, i.e., not one, more than one. Media means medium to communicate or talk. Now how would a computer talk to you. It would either create a sound, show a picture or some text on the screen. All this would be communicated to you by computer using medium like Monitor to show the text and picture, speaker to broadcast sound. All these mediums of the computer, like monitor and speaker are collectively called Computer Media.

Now what we make of Multimedia. It is a process by which computer communicates with you using more than one computer medium like sound, text, graphics, animation or video. Any two or more combinations from the above can be used and the net result can be displayed on the monitor screen or transferred to your web or the website which you may create.

Among the various applications of multimedia are the dazzling effects you can see in most of the advertisements on the TV. How about Pepsi advertisement of Oh Bubbly. It makes good use of sound, graphics, and animation. Most of the advertisements which you see on the TV are the results of computer created animation (using software called Flash, about which you would be reading in a later chapter) and combinations of pictures shot by either still or video camera. These pictures are then changed to suit according to needs using a software called Photoshop, about which too you will read in a later chapter.

A perfect example of Multimedia is the creation of a motion picture called Toy, which was totally made in the studio using the various animations and live actors. It used live pictures and merged them with animations and fit in the sound to create an effect which had been highly appreciated by many. Some time back Japanese made a complete film on Ramayan, totally animated with Hindi sound.

1.1.1 Advantages of Multimedia

Not comparing with any other media, the major advantages of multimedia are:

- **Make the Text more attractive:** You can design your multimedia project in such a way that the text, its readability is enhanced and is easier to read and look. This can be done by using the various applications of fonts, which are later discussed in the book.
- **Adding Video and Audio:** Have you ever wondered why TV is more popular than Radio. Simple, because in TV you can see and hear, whereas in Radio you can

just listen. So by adding both audio and video in your multimedia project, you can enhance the viewability and hearability of your project.

- **Merging of the media:** Multimedia is a great way of combining; text, audio, video, animation, graphics, etc., to make it more attractive not only in seeing but even in catching your eye on your multimedia project.
- **Easier to understand:** Multimedia makes it easier to understand the various topics which you are trying to explain.
- **Entertaining while learning:** Multimedia is such a process which makes you learn in a easier and entertaining way.

1.2 COMPONENTS OF MULTIMEDIA

Most multimedia and Web projects must be undertaken in stages. Some stages should be completed before other stages begin and some stages may be skipped or combined.

Here are the four basic stages in multimedia project:

1.2.1 Planning and Costing

A project always begins with an idea or a need that you refine by outline its messages and objectives. Identify how you will make each message and objective work within your authoring system. Before you begin developing, plan what writing skills, graphic art, music, video and other multimedia expertise will be required. Develop a creative graphic look and feel, as well as a structure and navigation system that will let the viewer visit the messages and content. Estimate the time needed to do all elements, and prepare a budget. Work up a short prototype of proof-of-concept. The more time you spend getting your arms around your project and defining its content and structure, the faster you can later build it and less reworking and rearranging will be required midstream.

Make a mental flow of the project before beginning to assemble.

1.2.2 Designing and Producing

Perform each of the planned tasks to create a finished product.

1.2.3 Testing

Always test your programs to make sure they meet the objectives of your project, they work properly on the intended delivery platforms and they meet the needs of your client or client user.

1.2.4 Delivering

Package and deliver the project to the end user.

1.2.5 Multimedia Needs

Needless to say that you need a good computer to start with. You also need software to

match it too. Not that since somebody told you to use a particular software, you will use that. You must use the software with which you are familiar with. This will help you in saving time and energy.

You also need to stay organized, because as the construction work gets under way, all the little bits and pieces of multimedia content will get lost under growing piles of paper, cassettes, videotapes, disks, phone messages, permissions and releases, cookie crumbs, photocopies and mail. Even in offices, where the floors are swept every morning, you are bound to loose some important paper which accidentally drops in the night. You must forget about time management. A project which you estimate to complete in 24 hours would normally take 48 hours. You will need time in abundance so that you are not racing against time, which would effect your output. Budgeting is another factor you should look into.

You cannot create a project all alone. It is very difficult though not impossible. You will need the help of other people. Multimedia is often a team effort: artwork is performed by graphic artists, video shoots by video producers, sound editing by audio producers and programming by programmers. You might have to do some dirty work like carrying things for others.

Let us have a look at the major factors like Hardware and Software. We would however discuss them in details in a later chapter.

1.2.5.1 Hardware

For all practical purposes we would be talking about PCs in general. This however, does not rule out the possibility of running the end product on any other computer. It can even be running on a TV with the help of a television set-top box such as Sega, Nintendo or Sony.

1.2.5.2 Operating system

When Windows is discussed in this book, it means Windows 95/98/ME/2000. The basic principles for creating and editing multimedia elements are the same for Apple Macintosh and PCs. A bitmap is a bitmap, a digitized sound is a digitized sound regardless of the methods or tools used to make and display it or play it back.

Indeed, many software tools readily convert picture, sound and other multimedia files (and even whole functioning projects) from Macintosh to Windows format, and vice versa, using known file formats or even binary compatible files that require no conversion at all. While there is a lot of talk about platform-independent delivery of multimedia on the Internet, with every new version of a browser there remain annoying failures on both platforms.

1.2.5.3 Software

Multimedia software tells the hardware what to do. Display the color red. Move that tiger three leaps to the left. Slide in the words "Now You've Done It!" from the right and blink them on and off. Play the sound of cymbals crashing. Run the digitized movie of Captain Hook. Turn down the volume on that MP3 file!

You do not have to be a programmer or a computer scientist to make multimedia work for you, but you do need some familiarity with terms and building blocks; even the simplest multimedia tools require an iota of knowledge to operate.

If someone sends you a file in Macintosh AIF format, you should know that you're getting digitalized sound. Then load up your tools and open the help files' your learning curve will be easier to manage because you have the bigger picture.

1.3 WEB AND INTERNET MULTIMEDIA APPLICATIONS

Some time back, a publisher in New Delhi issued Model Test Papers of class XI and XII in the form of CD-ROMs. You had to put the CD in the computer and it would ask you the question. You have to replay choosing one of the options given there and the result would come on the screen immediately. It is another form of training. Though the concept is quite new in India, but, is catching up fast in other countries.

The teaching method is more and more interactive using the multimedia concepts and instead of teacher asking the questions the questions are asked by the computer and students have to reply on the computer itself by pressing various keys. Thus, the result is compiled on the spot.

1.3.1 Science and Technology

Over the years Multimedia with the help of Internet has taken the Science and Technology to a new height. An experiment being done in USA can be watched in India. Of course, if the surgeon allows it to be seen. Similarly all the new information is passed over the thousands of computers in few seconds, to keep every user know about it. I know of cases where doctors in India send x-ray and other reports to the corresponding doctors in USA via Internet and ask for the possible treatments.

The same thing happens in other spheres of research. All the possible research materials are shared. The most important part which the Multimedia and Internet have given to the mankind is the communication. It takes hardly few seconds to transfer the sound and graphics from one part of the world to another.

1.3.2 Kiosks

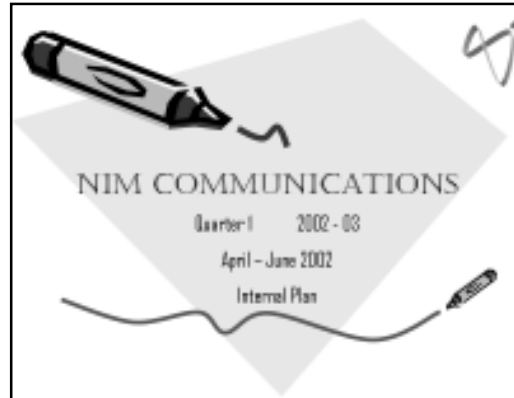
Kiosks are like booths, wherein you feed the data to get the information. These are very useful in places like Exhibitions, where you press a button to know where you are. All the relative information about the other places, which you can visit are shown along with maps, etc. We have one placed at Ashoka Hotel to help tourists know more about Delhi. Supposing you have to go to Karol Bagh from Ashoka Hotel, it would not just tell you the distance, but will also tell you the route and how much the Taxi and Scooter would charge.

In other countries similar types are available on railway stations, shopping malls, museums and grocery stores. These are stand-alone terminals or kiosks to provide information and help. Such installations reduce demand on traditional information booths and personnel,

add value and they can work round the clock, even in the middle of the night, when live help is off duty.

1.3.3 Business

I am quite sure that you must have seen a sales conference of a company. If not at least must have heard about it. There the speaker while talking about the sales has the various charts and graphs displayed on the board using the overhead projector. This becomes the part of the sales display and supports the figures given by the speaker. The same can now be done using the various facilities of the multimedia with graphs and sounds. The most common software used here is the presentation software from Microsoft named as Microsoft PowerPoint.



Multimedia is enjoying widespread use in training programs. The teacher replaces speaker in the above example. Flight attendants learn to manage international terrorism and security through simulation. Mechanics learn to repair engines. Sales people learn about product lines and leave behind software to train their customers. Fighter pilots practice full-terrain sorties before spooling up for the real thing.

1.3.4 Games

There is no limit to the number of games available in the market for playing on computers. These games are quite similar to the ones you see in so called Video Parlours. Most of them are interactive, i.e., they react to what you do or how you play. All of them are part of multimedia application, since all of them make good use of sound and graphics.

1.4 TRANSITION FROM CONVENTIONAL MEDIA TO DIGITAL MEDIA

Let us now learn about the Computer which you would need to create Multimedia. Not only computer, you also need software to match it too. You must use the software with which you are familiar. This will help you in saving time and energy. It is not that you would see the hardware which is needed now but you would also make mentally sure that the same would last at least 3 years.

Let us look at the two major factors like Hardware and Software in little details.

1.4.1 Hardware

For all practical purposes we would be talking about Personal Computers in general. This, however, does not rule out the possibility of running the multimedia product on any other computer. It can even be running on a TV with the help of a television set-top box such as Sega, Nintendo or Sony. These are becoming popular overseas though have a little presence in India.

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