

Multimedia Systems (3 – 0 - 3)

Evaluation:

	Theory	Practical	Total
Sessional	30	20	50
Final	50	-	50
Total	80	20	100

Course Objectives:

To introduce the technologies, concepts and techniques associated with the development of multimedia systems.

Course Contents:

1. Multimedia

4 hrs

- 1.1 Introduction: Overview of multimedia, Multimedia building blocks, Digital representation, Interaction techniques and devices.
- 1.2 The Medium aspect
- 1.3 Main Properties of Multimedia System
- 1.4 Definition of Multimedia Systems
- 1.5 Media Combination and Independence
- 1.6 Traditional Data Stream Characteristics
- 1.7 Information Units.

2. Sound and Audio

4 hrs

- 2.1 Basic Sound Concepts: Representation and Formats
- 2.2 Basic Music (MIDI) Concepts: Devices, Messages, Standards and Software
- 2.3 Speech: Generation, Analysis and Transmission.

3. Images and Graphics

4 hrs

- 3.1 Basic Image Concepts: Representation and Format
- 3.2 Image Processing Fundamentals: Synthesis, Analysis and Transmission.
- 3.3 Image Enhancement: Enhancement by point processing, Spatial filtering, Color image processing

4. Video and Animation

5 hrs

- 4.1 Basic Video Concepts: Representation and Format
- 4.2 Television
- 4.3 Basic Concepts of Animation
- 4.4 Types of animation
- 4.5 Principles of animation
- 4.6 Techniques of animation
- 4.7 Creating animation
- 4.8 Animation Language, Control and Transmission.

5. Data Compression **8 hrs**

5.1 Data Compression and Coding Fundamentals

5.1.1. Storage Space

5.1.2. Coding Requirements

5.1.3. Source, Entropy and Hybrid Coding

5.2 Basic Data Compression Techniques

5.3 Data Compression and Coding Standards:

5.3.1. JPEG

5.3.2. H.261 (px64)

5.3.3. MPEG

5.3.4. DVI.

6. Optical Storage Media **5 hrs**

6.1 Basic Technology

6.2 Video Disk Fundamentals

6.3 CD Audio

6.4 CD-ROM and Extended Architecture

6.5 Principles of CD-Write Once and CD-Magneto Optical

6.6 Other Storage Media: DVD, Flash Drive, HD Cards, USB

7. Computer Technology and Multimedia Operating Systems (MOS) **5 hrs**

7.1 Communication Architecture: Hybrid and Digital Systems

7.2 Multimedia Workstation

7.3 Introduction to MOS

7.4 Function of MOS

7.5 Multimedia Real Time System

8. Documentation, Hypertext and MHEG **5 hrs**

8.1 Document Architecture and Multimedia Integration

8.2 Hypertext, Hypermedia and Multimedia

8.3 Hypermedia System: Architecture, Nodes and Pointers

8.4 Document Architecture: SGML and ODA

8.5 MHEG.

9. Multimedia Communication Systems **5 hrs**

9.1 Definition of Multimedia Communication

9.2 Application Subsystem

9.3 Transport Subsystem: Requirements, Transport Layer, Network Layer

9.4 Quality of Service and Resource Management

Laboratory Exercises:

Laboratory Exercise includes integration of multimedia (Audio: Speech and Music, Video: Static and Movie, Animation Programming, etc), with application programs through high-level language programming, such as C++ or Java.

Text Book:

Steinmetz, R., Nahrstedt, K., *Multimedia: Computing, Communications and Applications*, Pearson Education Asia, 2001, ISBN: 81-7808-319-1

References:

- 1 Andleigh, P., Thakrar, *Multimedia Systems Design*, Prentice Hall, NJ, 1996
- 2 Gibbs S.J., Tsichritzis, D.C., *Multimedia Programming: Objects, Environments and Frameworks*, Addison-Wesley, 1995
- 3 Koegel-Buford, J.F., *Multimedia Systems*, Addison-Wesley, 1994
- 4 K.R. Rao, Zoran S. Bojkovic, Dragorad A. Milovanovic, *Multimedia Communication Systems: Techniques, Standards, and Networks*, Pearson, 2002
- 5 Ranjan Parekh, *Principle of Multimedia*, Tata McGraw-Hill Education, 2006