

**Department of Computer Science and Engineering**

**Department of Information Technology**

**1. List of PEOs and POs**

**PEOs:**

- I. The Graduates of the department will have Strong foundation in mathematics, basic sciences and engineering fundamentals to successfully compete for the various entry level positions or pursue higher studies in various Engineering and/or allied fields
- II. The Graduates of the department will have Contemporary and lifelong learning skills, familiarity with modern hardware and software tools and practices in Engineering and related domain.
- III. The Graduates of the programme will possess the required skills to perceive successfully the engineering profession including communication skills, working efficiently in multidisciplinary teams, understanding of ethical and environmental issues.

**POs:**

**PO-1** An ability to apply knowledge of Mathematics, Science, and Engineering.

**PO-2** An ability to design and conduct experiments as well as analyze and interpret data.

**PO-3** An ability to design a system, component, or process to meet desired needs.

**PO-4** An ability to function on multidisciplinary teams.

**PO-5** An ability to identify, formulates, and solves engineering problems.

**PO-6** An understanding of professional and ethical responsibility.

**PO-7** An ability to communicate effectively.

**PO-8** The broad education necessary to understand the impact of engineering solutions in a global/social context

**PO-9** A recognition of the need for and an ability to engage in life-long learning

**PO-10** Knowledge of contemporary issues.

**PO-11** An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.

**PO-12** Ability to model, design, optimize, control and analyze electronic and micro-electronic technologies, systems for the generation, processing and transmission of electric signals, telecommunications systems and networks.

## List of Course Outcomes(COs)

### COs:

After the Completion of course student will able to learn:

1. To Know the fundamental video, audio, image, text processing techniques
2. Acquire the basic skill of designing video compression, audio compression, image compression, text compression.
3. To Know the basic techniques in designing video transmission systems: error control and rate control
4. To Identify basic concepts, terminology, theories, models and methods in the field of computer vision.

## 3. Course Syllabus: Multimedia & Computer Vision

### Subject Code: A000213(022)

Program / Semester: <b>B.Tech (VIII Sem)</b>	Branch: <b>Computer Science &amp; Engineering</b>
Subject: <b>Multimedia &amp; Computer Vision</b>	Course Code: <b>D022833(022)</b>
Total / Minimum-Pass Marks (End Semester Exam): <b>100 / 35</b>	L: 2 T: 1 P: 0 Credits: <b>3</b>
Class Tests & Assignments to be conducted: <b>2 each</b>	Duration (End Semester Exam): <b>03 Hours</b>

#### Course Objective:

1. To understand the fundamental issues and problems in the representation, manipulation, and delivery of multimedia content particularly in a networked environment.
2. To understand the concepts of multimedia components.
3. To understand the basic concepts of Computer vision.

#### UNIT-I: Introduction

Concept of Multimedia, media & data stream, Main properties of multimedia system, Data stream characteristics of continuous media, multimedia Applications, Hardware and software requirements, Multimedia Products & its evolution.

#### UNIT-II: Components Of Multimedia

Text, Basic sound concepts, MIDI, Speech, Basic concepts of Images, Graphics, Overview of image processing, Basic concepts of Video & animation, Conventional system, Transmission, Enhanced system, High- Definition system, Computer based animation, Design & authoring Tools, Categories of Authority Tools, Types of products

#### UNIT-III: Data Compression

Coding requirements, Source entropy, hybrid coding, JPEG, MPEG, Text compression using statistical Huffman

technique, Dynamic Huffman Technique, Statistical coding techniques.

#### **UNIT-IV: Optical Storage Media**

Videodisk and other WORMS, Compact Disk digital audio, Advantage of CD-DA Frames tracks blocks of CD-DA, CD-ROM, and Further CD-ROM based developments, Principles of CDWO, Prospects of CD technologies.

#### **UNIT-V: Introduction To Computer Vision**

Overview, computer imaging systems, lenses, Image formation and sensing, Image analysis, pre-processing and Binary image analysis, feature detection, image classification.

#### **Text Books:**

1. Multimedia System Design, Andleigh and Thakarar , PHI, 2003.
2. Multimedia Technology & Application, David Hillman, Galgotia Publications.
3. Computer Vision: A modern approach, Forsyth & Ponce, 2nd Ed., Pearson 2011

#### **Reference Books:**

1. Multimedia Computing Communication and Application, Steinmetz, Pearson Edn.
2. Fundamentals of Computer Graphics and Multimedia, D.P. Mukherjee, PHI

## **8. Instructional schedule / Lesson plan (Theory) :**

### **Unit I: Introduction (10 lectures)**

**Lecture 1,2:** Concept of Multimedia, media & data stream

**Lecture 3,4:** Main properties of multimedia system

**Lecture 5,6:** Data stream characteristics of Continuous media.

**Lecture 7,8:** Multimedia applications.

**Lecture 9 :** Hardware and software requirements.

**Lecture 10:** Multimedia products and its evolution.

### **Unit II: Components Of Multimedia (10 lectures)**

**Lecture 1 :**Text, Basic sound concepts, MIDI,

**Lecture 2:** Speech, Basic concept of Images,

**Lecture 3:** Graphics format,

**Lecture 4:** Overview of image, processing,



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**Lecture 5: Basic concepts of Video & animation,**

**Lecture 6: Conventional system,**

**Lecture 7: Transmission, Enhanced system, High- Definition system,**

**Lecture 8: Computer based animation, Design & authoring Tools,**

**Lecture 9: Categories of Authority Tools**

**Lecture 10: Types of products.**

**Unit III: Data Compression (10 lectures)**

**Lecture 1:** Data Compression , Coding requirement,

**Lecture 2:** Source, entropy,

**Lecture 3:** hybrid coding,

**Lecture 4:** JPEG, MPEG, Text

**Lecture 5,6:** compression using static Huffman technique,

**Lecture 7,8:** Dynamic Huffman Technique,

**Lecture 9,10 :** Statistical coding techniques.

**Unit IV: Optical Storage Media (10 Lectures)**

Lecture 1: Videodisk and other WORMS,

Lecture 2: Compact Disk digital audio,

Lecture 3: Advantage of CD-DA

Lecture 4: Frames tracks blocks of CD-DA,

Lecture 5,6: CD-ROM, Frame tracks blocks of CD-ROM.

Lecture 7: Further CD-ROM based developments,

Lecture 8: Principles of CDWO,

Lecture 9,10: Prospects of CD technologies.

**Unit V: Introduction To Computer Vision (10 lectures)**

Lecture 1: Overview, computer imaging systems,

Lecture 2: lenses,

Lecture 3: Image formation and sensing,

Lecture 4: Image analysis,



Lecture 5: pre-processing

Lecture 6: Binary image analysis,

Lecture 7: feature detection,

Lecture 8,9,10 : image classification.

# APPENDIX-I

## Assignment Questions

**Blooms Taxonomy Levels/phases :** Remembering (RE), Understanding(UN), Applying (AP), Analyzing (AN), Evaluating (EV), Creating (CR)

### Assignment 1(Unit 1)

S.No.	Question	Bloom's Taxonomy Level	CO
1	Define the term Multimedia. Explain its Need and Evolution.	UN	1
2	Explain the Benefits of multimedia.	AN	1
3	What do you mean by media. How can you classify media	RE,UN	1
4	Explain the various Datastream characteristics of continuous media?	UN	1
5	What are the hardware and software requirement for multimedia ?	RE	1
6	Write about various multimedia products and its evolution ?	RE,UN	1
7	Explain the various application of multimedia.	RE	1
8	Define the term multimedia system. List the various properties of multimedia system.	UN,RE	1
9	What do you mean by data stream. Write the difference between strongly periodic stream and weakly periodic stream.	RE,UN	1
10	Justify your statement that the DataStreams are irregular.	RE, AN	1
11	Compare Continuous stream with Discrete stream.	RE,UN,AN	1

## Assignment 2(Unit 2)

S.No.	Question	Bloom's Taxonomy Level	CO
1	Explain the term MIDI.	RE,UN	1,2
2	Define Sound.	UN	1,2
3	List the various formats available for graphics.	UN,AN	1,2
4	Write the steps to process an image.	UN,AN,CR	1,2
5	What do you mean by video and animation.	UN	1,2
6	How computer based animation is better than the conventional system.	EV	1,2
7	List various authoring tool. Also categorize the Authority tool.	RE,UN	1,2
8	Write about the frequency range for Infrasound, ultrasound,Hypersound and also for human hearing frequency range.	RE	2
9	What do you mean by frequency , amplitude.	RE	2
10	What do you mean by sampling rate and Quantization.	RE	2
11	What are the various common component that a synthesizer.	RE,UN	2
12	Explain the term speech analysis.	UN	2
13	Explain with neat diagram about the component of speech recognition and understanding.	RE,UN	2
14	How one can represent an image in digital form.	UN	2
15	Explain the various steps involved in image recognisition	UN	2
16	What do you mean by flickers.	RE	2
17	Explain why HDTV is called the next generation of TV.	UN	2
18	Explain the methods of controlling Animation.	UN	2

## Assignment 3(Unit 3)

S.No.	Question	Bloom's Taxonomy Level	CO
1	What to you mean by Data Compression. What are the basic requirement of coding. Also Explain about Entropy.	RE,UN	1,2,3
2	Explain the term hybrid coding	UN	3
3	Explain the static huffmann technique for Text compression.	UN	3
4	Explain the dynamic huffmann technique for text compression .	RE,UN	3
5	How statistical coding technique is used for compression	UN,AP	3
6	Compare and contrast the JPEG and MPEG.	AN	2,3
7	Distinguish among entropy, source and hybrid encoding also give a rough classification of coding technique in multimedia systems.	UN	2,3
8	Explain the major steps of data compression.	UN	3
9	Write about the various steps of the JPEG compression process.	UN	3
10	Explain what are the different type of image codeing for processing used in MPEG. Or What do u mean by I-frame, P-frame, D-frame and B-Frame.	RE,UN	3
11	Write the MPEG basic steps of audio encoding.	RE,UN	3



## Assignment 4(Unit 4)

S.No.	Question	Bloom's Taxonomy Level	CO
1	What do u understand by optical storage media.	RE,UN	4
2	What is compact disk digital audio. Also write the advantages of CD-DA.	RE,UN	4
3	Explain the term Frame, track and block of CD-DA.	RE,UN,AP	4
4	What to you mean by CD-ROM?	RE,UN	4
5	Explain the Principle of CDWO.	RE,UN,AP	4
6	What are the various prospects of CD technologies.	RE,UN	4

## Assignment 5(Unit 5)

S.No.	Question	Bloom's Taxonomy Level	CO
1	Explain the term lense.	UN	5
2	What do you mean by computer imaging system.	RE,UN	5
3	Write the steps to analyze an image. Expalin with example.	UN,AP	5
4	What are the steps involved in proceesing an image.	UN,AP	5
5	How a binary image is analyze. Explain with example	UN	5
6	What are the various way to classify an image.	UN	5
7	What is the role of feature detection.	UN	5



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