Institute:	Institute of Technology
Name of Programme:	B.Tech. Electronics & Communication Engineering
Course Code:	3EC402ME24
Course Title:	Multimedia Systems
Course Type:	Departmental Elective
Year of Introduction:	2024-25

L	T	Practical component				C
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Course Learning Outcomes (CLOs):

At the end of the course, students will be able to

1. comprehend the fundamental of Multimedia systems and types of media systems.   BL-2
2. apply compression techniques to Text, Image and Video data.
3. analyse hardware components, software and buses used in multimedia systems.   BL-3
4. evaluate synchronisation, networking and content management protocols of   BL-4
   multimedia communication.   BL-5

Unit No.	Contents	Teaching hours (Total 45)
I	**Introduction:** Multimedia systems, issues in multimedia systems, media types-text, images, video, audio and its representation, animation	06
II	**Compression:** Lossy compression, lossless compression, entropy coding, text Compression- LZ, LZW, Arithmetic coding, image Compression- GIF, Transform Coding: DCT, KLT, principal Component analysis, JPEG, JPEG 2000 standards, audio and video compression- MPEG 1, MPEG 2, MPEG 4 and MPEG 7 Standard 3-D model compression speech and audio compression	15
III	**Media Synchronisation:** Stream management, System Decoder model, DMIF (Delivery Multimedia Integration Framework), synchronisation elementary streams and layers, multimedia system design - hardware: processor architecture, bus structure, digital I/O, analog I/O, video camera, I/O devices, multimedia buses: PCI and its variant, DVI, HDMI, firewire, multimedia OS-scheduling algorithms (EDF, RMS) resource management, management of I/O system	10
IV	**Network Communication:** Communication networking, delivery modalities, integrated network, issues related to transfer of data: audio, video, image, speech and text, properties of multimedia servers	08
V	**Multimedia Content Management and Retrieval:** Stored media access, media filtering, content-based query, query-based example, CBIR (Content Based Image Retrieval) video retrieval	06

Self-Study:

The self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from self-study content.

Suggest List of Tutorials (not restricted to the following):
(Only for information)

Sr. No.	Title of the tutorial	Hours
1.	Introduction to Multimedia Systems	01
2.	Lossy and Lossless Compression	01
3.	Text Compression	01
4.	Image Compression	01
5.	Audio Compression	01
6.	Video Compression	01
7.	Speech Compression	01
8.	Media Synchronisation	01
9.	Multimedia System Design - Hardware	01
10.	Multimedia Buses	01
11.	Multimedia OS	01
12.	Network Communication	01
13.	Multimedia Servers	01
14.	Multimedia Content Management & Retrieval	01
15.	Media Types	01

Suggested Readings:
1. Ze-Nian Li, Mark S. Drew, Fundamentals of Multimedia, Prentice Hall India
2. Kalid Sayood, Data Compression, Morgan Kauffman Publishers
3. David Saloman, Data Compression: The complete reference guide, Springer
4. Fred Halsall, Multimedia Communications, Applications, Networks, Protocols and Standards, Pearson Education
5. Ralf Steinmetz, Multimedia Computing, Pearson Education