

**NIRMA UNIVERSITY**  
**SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY**  
**B.Tech. Electronics & Communication Engineering**  
**Semester - VI**  
**Department Elective III**

L	T	P	C
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<b>Course Code</b>	<b>2ECDE56</b>
<b>Course Title</b>	<b>Multimedia Systems</b>

**Course Outcomes (COs):**

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

1. Evaluate lossy and lossless compression methods for multimedia content transmission.
2. Apply transform coding algorithms for image compression applications.
3. Analyse image, video and audio compression standards.
4. Comprehend multimedia communication network protocols, DTH technology and media synchronization methods for real word communication-related applications.

**Syllabus:**

**Teaching Hours:45**

<b>UNIT 1: Introduction</b>	<b>04</b>
Multimedia systems, Issues in multimedia systems, Text, Images, Video, Audio and its representation, Human visual and Auditory system fundamentals.	
<b>UNIT II: Compression Methods</b>	<b>07</b>
Lossy and Lossless compression, Entropy coding, Arithmetic coding Dictionary-based coding, Vector and Scalar quantization methods.	
<b>UNIT III: Image Compression</b>	<b>08</b>
Transform Coding: DCT, Wavelet Transform, JPEG standards and transmission modes	
<b>UNIT IV: Video and Audio Compression Standard</b>	<b>10</b>
H.261, and MPEG Standard, Audio Compression standards HEVC, VP8	
<b>UNIT V: Multimedia Network Communication</b>	<b>10</b>
Communication Networking, Issues related to Transfer of data: Audio, Video, Image, Speech and text, Internet protocol architecture: Real-time transfer protocol (RTP), Session Initiation Protocol (SIP), Buffer Management Techniques	
<b>UNIT VI: Media Synchronization</b>	<b>06</b>
Stream management, DTH Set up Box Design, Conditional Access Mechanism (CAS), Synchronization elementary streams and layers,	

**Self-Study:**

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

**Laboratory Work:**

Laboratory work will be based on the above syllabus with a minimum of 10 experiments to be incorporated.

**Suggested Readings:**

1. Li & Drew, Fundamentals of Multimedia, PHI
2. David Soloman, Data Compression – The Complete Reference, Springer
3. Halsall, Multimedia Communications & Networking, Person Education Asia
4. Steiner, Multimedia Computing, Person Education Asia

L = Lecture, T = Tutorial, P = Practical, C = Credit