SE5071 MULTIMEDIA SYSTEMS AND APPLICATIONS L T P C
3 0 2 4

OBJECTIVES:

- To enrich student learning in Multimedia systems basics
- To train the students to acquire knowledge in multimedia Tools and authoring
- To acquire knowledge about multimedia data compression techniques
- To acquire knowledge in the area of multimedia communication systems
- To know about popular multimedia application areas

UNIT I MULTIMEDIA ELEMENTS 9+6

Principles – Cognition, Learning, Interaction, Medium of Consumption: Elements - Text – characteristics, standards, formats; Graphics – representation, file formats, Image / Graphics – file formats, standards; Digital Audio – Characteristics, formats, standards, Speech, Video – characteristics, formats; Animation – characteristics, formats; , Multidimensional Data Structures, k-d trees, Quad Trees, R-trees.

UNIT II MULTIMEDIA TOOLS and AUTHORING 9+6

Hardware – Display Devices, wearables, Graphics cards, I/O devices, software – Editing tools for Text, Image, Audio, Video and animation. Authoring tools, Authoring Multimedia presentations, Authoring Metaphors.

UNIT III MULTIMEDIA COMPRESSION 9+6

Symmetric and Asymmetric methods, Lossy and Lossless Compression,Text compression – RLE, Huffman,Arithmetic, Dictionary based; Document Image compression standards – CCITTand Color Image Compression – JPEG, Audio Compression – PCM, ADPCM, MPEG, AAC, AC3, speech compression; Video Compression-MPEG-4, H.265, DVI

UNIT IV MULTIMEDIA COMMUNICATION SYSTEMS 9+6

Multimedia Communication Standards,Transport Protocols, streaming protocols, Internet Protocols Wireless multimedia communications, synchronization and QOS, security, Entertainment networks, Collaborative multimedia support, Real-time distributed multimedia networks, Hypertext, Hypermedia.

UNIT V MULTIMEDIA APPLICATIONS 9+6

Applications for WWW.Multimedia databases – Indexing and Retrieval, Visualization, Virtual, Augmented and Mixed Reality, Interactive E-learning, HCI and UX design,Games and Animation, Real-Time video conferencing.

PRACTICAL EXERCISES:

1. Editing various images (Image restoration, Changing colour image to Grey scale and vice versa) and adding special effects to images using tools like Photoshop, Gimp and flash
2. Creating and Editing various video clippings and adding special effects using tools like Adobe Premier Pro
3. Creating and Editing various audio files and adding special effects using tools like SoundForge and Audacity
4. Creating three dimensional models and animations using tools like Blender, 3DS Max, Unity
5. Working on Text compression algorithms like Run length and Huffman
6. Implementation of transformations like DCT and FFT
   Designing User Interfaces and developing simple games using multimedia tools
7. Creating simple multimedia applications using any popular Authoring tools
8. Mini Project(4 Periods)

OUTCOMES:

On Completion of the course, the students should be able to:

- Handle the multimedia elements effectively
- Use Multimedia Hardware and Software for Editing and Authoring multimedia applications
- Implement Compression algorithms for various multimedia applications
- Develop effective strategies to deliver Quality-of-Experience in networked Multimedia applications
- Design and develop multimedia applications in various domains

TOTAL: 75 PERIODS

TEXTBOOKS:

1. Ze-Nian Li, Mark S. Drew, Jiangchuan Liu, “Fundamentals of Multimedia”, Second Edition, Springer Nature (Texts in Computer Science), 2014.
2. Prabhat K. Andleigh, Kiran Thakrar, “Multimedia Systems Design”, Pearson Education India, Ist Edition, 2015
3. Ralf Steinmetz and KlaraNahrstedt, “Multimedia computing, communications, and applications”, Pearson India, Pearson, 2002.

REFERENCES:

1. Fred Halsall, “Multimedia Communications: Applications, Networks, Protocols and Standards”, Pearson Education, 2002.
2. Khalid Sayood, “Introduction to Data Compression”, 4th Edition, Morgan Kauffman, 2012.
3. K.R. Rao, Zoran S. Bojkovic, Bojan M. Bakmaz, “ Wireless Multimedia Communication systems: Design, Analysis and Implementation”, CRC press, 2017.
4. V.S. Subrahmanian, “Principles of Multimedia Database Systems”, Elsevier / Morgan Kauffmann, 2008.

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