

Audio Video Engineering (404211)

Teaching Scheme:

Lectures: 3 Hrs/ Week

Examination Scheme:

In Semester Assessment:

Phase I : 30

End Semester Examination:

Phase II: 70

Course Objectives:

The objective is to provide students with a strong understanding of the fundamental principles and practical applications of audio and video engineering with latest updates.

Course Outcomes:

After successfully completing the course students will be able to

1. Understand the concept of basic television signal processing
2. Identify globally accepted colour TV standards
3. Demonstrate the need of audio and video compression techniques in real life
4. Acquire knowledge of latest digital TV systems and applications
5. Describe the attributes of acoustics, sound engineering and storage media.

Unit I : Fundamentals of Colour Television:

6L

Aspect, scanning, perception of brightness and colour, colour mixing, composite video signal, synchronisation details, digital TV camera, modulation of audio and video, terrestrial signal transmission, video displays: LCD vs LED.

Unit II : Colour Standards and digital video

8L

Standards: NTSC, PAL, SECAM colour system, generalized colour TV receiver block diagram, study of functionality of each block, alignment issues, sampling of video signal, colour sub sampling, composite vs component video, interlace vs progressive scan.

Unit III : Digital TV

6L

Digital video, resolution, notation, digital video formats, digital video quality measure, video restoration, video streaming, DTH, Video compression: MPEG 2, MPEG 4, comparison of SDTV, EDTV and HDTV.

Unit IV : Advanced TV Systems and Techniques

6L

Introduction to UHD TV: 4K and 8K, IPTV/web TV, smart TV, Wi-Fi TV, digital surveillance, 3D TV concept, over view of H.264 features, camcorders, webcams, perspective of TV White spaces.

Unit V : Acoustics

6L

Human Hearing and sound, frequency range, dynamic range, masking, digital representation of sound wave, intensity, decibel sound level, sound waves in rooms, reverberation, room/studio acoustics as a component in speech system, PA systems, special types of microphones and speakers.

Unit VI : Audio and Video Recording Systems

6L

Digital sound, sound recording, CD/ DVD player, MP3 player, Blue Ray DVD Player, ITU-T(G) compression standards, multichannel/Dolby 5.1 sound in DTV.

Text Books

1. A.M. Dhake, *Television and video Engineering*, TMH Publication, 2nd Edition, 2001
2. Kelth jack, *Video Demystified: A Handbook for the Digital Engineer*, 5th Edition, Newnes, 2007.
3. R.G. Gupta, *Audio and Video Systems*, McGraw Hill Education (India), 2nd Edition, 2010.

Reference Books

1. S. P. Bali, *Color Television Theory and Practice*, McGraw Hill Education (India), 1994
2. A.M. Tekalp, *Digital Video*, Prentice Hall, 1995
3. R.P. Gulathi, *Modern Television Practice*, 4th edition, New Age International Publisher, 2014

List of experiments:

1. Voltage waveform analysis of Digital TV Receiver.
2. Study of DTH and STB
3. Study of WC and color pattern generator with pattern analysis
4. Study of HDTV/UHDTV
5. Study of Wi-Fi TV system
6. Study of DVD/Blue ray player
7. Study of audio player: MP3 player
8. Study of audio and video coding scheme (soft)
9. Study of PA system
10. Directivity pattern of microphone/ speakers.
11. TV studio/station/relay station visit and report writing
12. Self study visit: summaries information obtained from dealers on UHD TVs and camcorders (optional)