

IV Year - I Semester

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## TELEVISION ENGINEERING (Elective- I)

### UNIT I

**INTRODUCTION:** TV transmitter and receivers, synchronization. Television Pictures: Geometric form and aspect ratio, image continuity, interlaced scanning, picture resolution, Composite video signal: Horizontal and vertical sync, scanning sequence, Colour signal generation and Encoding: Perception of brightness and colours, additive colour mixing, video signals for colours, luminance signal, colour difference signals, encoding of colour difference signals, formation of chrominance signals, PAL encoder.

### UNIT II

**TV SIGNAL TRANSMISSION AND PROPAGATION:** Picture signal transmission, positive and negative modulation, VSB transmission, sound signal transmission, standard channel BW, TV transmitter, TV signal propagation, interference, TV broadcast channels.

**MONOCHROME TV RECEIVER:** RF tuner, IF subsystem, video amplifier, sound section, sync separation and processing, deflection circuits, scanning circuits.

**PAL-D colour receiver:** Electron tuners, IF subsystem, Y-signal channel, chroma decoder, separation of U & V Colour phasors, synchronous demodulators, subcarrier generation, raster circuits.

### UNIT III

**VISION IF SUBSYSTEM:** AGC, noise cancellation, video and intercarrier sound signal detection, Colour receiver IF subsystem, Receiver sound system: FM detection, FM Sound detectors, typical applications. TV Receiver Tuners: Tuner operation, VHF and UHF tuners.

**COLOUR SIGNAL DECODING:** PAL-D decoder, chroma signal amplifiers, separation of U and V signals, Color burst separation, Burst phase discriminator, Reference oscillator, Indent and color killer circuits, RO phase shift and 180 degrees PAL-SWITCH circuitry, U & V demodulators, Colour signal mixing.

### UNIT-IV

**HISTORY OF HDTV:** Analog and Digital TV Compared, Going HD, Broadcast Engineering and Information Technology, The Road to HDTV, The Grand Alliance, A DTV Standard at Last, Producing HDTV, HD Goes Coast-to-Coast, DTV Conversion.

**COMPRESSION TECHNIQUES:** Compression, MPEG-2 Video Compression, MPEG-4, H.264, Motion – JPEG (M-JPEG) compression, Audio Compression, Compressed Data Streams, Packetized Transport.

### UNIT V

**DTV TRANSMITTER AND RECIEVER:** Engineering Basics, Presentation, Transmission, Reception and Demodulation, Transport Stream Demultiplexing, Decoding and Decompression, Program Assembly and Presentation, Receiver Issues, Presentation Concerns.

**HDTV AND DTV STANDARDS:** Standards Bodies, The ATSC Standards, SMPTE Standards, The Audio Engineering Society, Cable DTV Standards, Institute of Electronic and Electrical Engineers, The Consumer Electronics Association, Other Societies and Organizations.

### UNIT VI

**EMERGING TECHNOLOGIES AND STANDARDS:** Technology and Standards Development, Presentation, Delivery and Distribution, MPEG and Metadata, Enhanced, Interactive and Personalized, Virtual Product Placement, Multiplatform Emergency Alert System.

## **TEXT BOOKS**

1. Modern Television Practice – Principles, Technology and Service – R.R.Gulati, New Age International Publication, 2002
2. Television and Video Engineering – A.M.Dhake, 2<sup>nd</sup> Edition,
3. “HDTV and the Transition to Digital Broadcasting: Understanding New Television Technologies” by Philip J. Cianci, Focal Press, 2007.
4. “Digital Video and HDTV Algorithms and Interfaces” by Charles Poynton, Morgan Kaufman publishers, 2007.

## **REFERENCES**

1. Basic Television and Video Systems – B.Grob and C.E.Herndon, McGrawHill, 1999
2. “Newnes Guide to Television and Video Technology” by Ibrahim.K.F, Newnes Publishers, 4<sup>th</sup> edition, 2007.
3. “H.264 and MPEG-4 and Video compression video coding for Next-generation Multimedia” by Iain E. G. Richardson, John Wiley & Sons Ltd., 2003.

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