



**COURSE TITLE** : TELEVISION ENGINEERING  
**COURSE CODE** : 6046  
**COURSE CATEGORY** : E  
**PERIODS PER WEEK** : 4  
**PERIODS PER SEMESTER** : 60/6  
**CREDITS** : 4

**TIME SCHEDULE**

Module	Topics	Periods
1	Audio systems	15
2	Fundamentals of color TV	15
3	Digital TV	15
4	Modern TV technologies	15
<b>Total</b>		<b>60</b>

Course General outcome :

Module	GO	On completion of the study of this course the students will be able :
1	1	To understand the concepts of microphone and loudspeakers.
	2	To understand the basics of sound recording and reproduction.
2	3	To understand the basics of colour TV broadcasting.
	4	To understand the concept of CCD Camera.
3	5	To understand the characteristics of Digital TV system.
	6	To understand the concepts of colour picture tubes.
4	7	To understand different TV technologies.
	8	To know the operation of different types of displays.

*GO - General Outcome*

On completion of the study the student will be able :

**MODULE I AUDIO SYSTEMS**

**1.1.0 To understand the concepts of microphone and loud speakers.**

- 1.1.1 To state the principle of operation of microphones
- 1.1.2 To explain construction and characteristics of moving coil, ribbon, crystal and condenser microphones
- 1.1.3 To state the principle of operation of loud speakers



- 1.1.4 To explain the construction and characteristics of moving coil, electro-dynamic type loud speakers

**1.2.0 To understand the basics of sound recording and reproduction.**

- 1.2.1 To explain with block diagram the audio Compact disc recording and reproduction.
- 1.2.2 To explain the working principle of Hi-Fi stereo system.
- 1.2.3 To explain the concept of Dolby system.
- 1.2.4 To explain with diagram PA system.

**MODULE II FUNDAMENTALS OF COLOUR TV**

**2.1.0 To understand the basics of colour TV broadcasting.**

- 2.1.1 To describe aspect ratio.
- 2.1.2 To describe with diagram composite video signal.
- 2.1.3 To explain luminance, hue and saturation.
- 2.1.4 To describe mixing of colours - additive mixing and subtractive mixing.
- 2.1.5 To illustrate colour difference signal.
- 2.1.6 To explain chromaticity diagram.
- 2.1.7 To describe the significance of selecting R-Y and B-Y signal.
- 2.1.8 To compare colour TV systems – NTSC, PAL, SECAM.
- 2.1.9 To explain the block diagram of PAL D encoder & decoder.

**2.2.0 To understand the concept of CCD Camera.**

- 2.2.1 To explain with figure the operation of CCD camera.

**MODULE - III – DIGITAL TV**

**3.1.0 To understand the characteristics of Digital TV System.**

- 3.1.1 To describe the basic principle of Digital TV.
- 3.1.2 To define Digital TV signals and parameters.
- 3.1.3 To explain the block diagram of Digital TV transmitter.
- 3.1.4 To describe MAC signals.
- 3.1.5 To explain advanced MAC signal transmission.
- 3.1.6 To explain the working of Digital TV receiver.
- 3.1.7 To explain the principles of Digital Video compression techniques, MPEG1, MPEG2, MPEG4.
- 3.1.8 To explain Video compression ITU-Standards.



3.1.9 To explain Digital TV recording techniques.

**3.2.0 To understand the concepts of colour picture tubes.**

3.2.1 To explain the construction and operation of PIL picture tube.

3.2.2 To explain the construction and operation of Delta gun picture tube.

3.2.3 To explain the construction and operation of Trinitron picture tube.

**MODULE IV MODERN TV TECHNOLOGIES**

**4.1.0 To understand different TV technologies.**

4.1.1 To explain HDTV standards and system.

4.1.2 To explain block diagram of HDTV transmitter.

4.1.3 To explain block diagram of HDTV receiver.

4.1.4 To describe Digital TV satellite Systems.

4.1.5 To explain CCTV system.

4.1.6 To explain CATV system.

4.1.7 To explain Direct to home TV.

4.1.8 To explain set top box.

4.1.9 To explain CAS.

**4.2.0 To know the operation of different types of displays.**

4.2.1 To describe LCD

4.2.2 To describe LED display

4.2.3 To describe OLED display

4.2.4 To compare the different types of displays

**CONTENT DETAILS**

**Module I Audio Systems**

Microphone - characteristics – types - principle of operation - construction - applications - moving coil – ribbon - crystal – Condenser - loud speakers - characteristics – types – principle of operation - construction – comparison - moving coil – Electro-dynamic type - Compact disc -optical recording – playback - block diagram – advantages – disadvantages - Hi-Fi system – requirements – Hi-Fi stereo system – block diagram - noise reduction system - Dolby A - Dolby B - PA system – block diagram – requirements.



## **Module II Fundamentals of Colour TV**

Television basics - factors of TV systems - aspect ratio - composite video signal - signal transmission and channel bandwidth etc - colour fundamentals - luminance – hue – saturation - mixing of colours - additive mixing and subtractive mixing - colour difference signal - chromaticity diagram - significance of selecting (R-Y) and (B-Y) signal - Colour TV systems – NTSC, PAL, SECAM (comparison only) – PAL D encoder & decoder- CCD camera – operation.

## **Module III Digital TV**

Digital TV - Introduction – principle - signals and parameters – Transmitters - MAC signals - advanced MAC signal transmission - digital TV receivers - basic principles of digital Video compression techniques - MPEG1 - MPEG2 - MPEG4 - video compression ITU - Standards(H) - digital TV recording techniques – colour picture tube – PIL- Delta gun – Trinitron - operation.

## **Module IV Modern TV technologies**

HDTV standards and systems - HDTV transmitter and receiver/encoder - Digital TV satellite Systems - video on demand – CCTV – CATV - direct to home TV - set top box with recording facility - conditional access system (CAS) - Displays devices - LCD - LED - OLED - operation – comparison.

## **TEXT BOOK**

1. Modern Television Practice Transmission, Reception and Applications - Fourth edition - R R Gulati - New Age International Publishers.
2. Audio and Video Systems Principles, Maintenance and Troubleshooting – R G Gupta - Tata McGraw Hill.

## **REFERENCES**

1. Audio Video and TV Engineering Consumer Electronics - Ajay Sharma - Dhanpat Rai and Co.
2. Consumer Electronics – Bali
3. Monochrome and Colour Television - R R Gulati - New Age International Publishers.
4. Television and Video Engineering - A M Dhake - Tata McGraw Hill.