Course Code	Course Title	L	T	P	C
1152EC112	DIGITAL TV ENGINEERING	3	0	0	3

a) Course Category

Program elective

b) Preamble

Television Technology has now become a vital tool to the information revolution that is sweeping across the countries of the world. The syllabus aims at a comprehensive coverage of Television Systems with all the new developments in Television Engineering

c) Prerequisite

Antenna and wave propagation

d) Related Courses

Communication theory, Digital communication

e) Course educational objectives

1. To study the analysis and synthesis of TV Pictures, Composite Video Signal, Receiver Picture Tubes and Television Camera Tubes
2. To study the principles of Monochrome Television Transmitter and Receiver systems.
3. To study the various Color Television systems with a greater emphasis on PAL system.
4. To study the advanced topics in Television systems and Video Engineering

f) Course Outcomes

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Knowledge Level (Based on Revised Bloom's Taxonomy)
CO1	Explain digital TV transmission and reception, processors such as audio and video.	K2
CO2	Discuss the various picture tubes such as camera tubes, cam coder, image orthicon, vidicon etc.	K2
CO3	Summarize the concepts of digital transmission and reception such as MPEG.Digital Video Broadcasting (DVB)	K2
CO4	Discuss the elements of digital TV system.	K2
CO5	Summarize the high definition TV standards and its components.	K2

e) Correlation of COs with POs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	M	M	-	M	M	-	-	-	-	-	-	L	-	-
CO2	M	-	-	-	-	L	-	-	-	-	-	L	-	-
CO3	M	-	-	L	-	-	L	-	-	-	-	L	-	-
CO4	H	L	-	-	L	-	L	-	-	-	-	-	-	-
CO5	-	L	-	-	-	-	M	-	-	-	-	M	-	-

f) Course Content

UNIT I DIGITAL TELEVISION 9

Merits of Digital technology, Digital TV signals , Digitized video parameters ,digital transmission and reception, codec Functions ,codec MAA2100 ,Video processor, Audio processor

UNIT II TV CAMERAC AND PICTURE TUBES 9

Principle of camera tubes, camcorder, image orthicon, vidicon, plumbicon, solid-state image scanners, elements of a picture tube, focusing and deflection, EHT ,HOT picture tube controls , Delta gun, PIL, Trinitron, color camera & picture tubes purity & convergence ,automatic degaussing

UNIT III COLOUR SIGNAL TRANSMISSION AND RECEPTION 9

Digital TV: Digitized Video, Source coding of Digitized Video – Compression of Frames – DCT based – (JPED), Compression of Moving Pictures (MPEG). Basic blocks of MPEG2 and MPE4. Digital Video Broadcasting (DVB) – Modulation: QAM – (DVB-S, DVB-C), OFDM for Terrestrial Digital TV (DVB –T). Reception of Digital TV Signals (Cable, Satellite and terrestrial). Digital TV over IP, Digital terrestrial TV for mobile. Display Technologies – basic working of Plasma, LCD and LED Displays.

UNIT IV ELEMENTS OF A DIGITAL TELEVISION SYSTEM 9

Television: Scanning, Blanking and synchronization, Picture signal - composite video signal Vestigial sideband transmission-Principle of CCD Camera - Monochrome picture tube- Monochrome TV receivers- RF tuner ,VHF tuner- Video amplifier, IF section, Vestigial sideband correction- Video detectors, Sound signal separation, AGC, sync separation, horizontal and vertical deflection circuits, EHT generation. Color TV system: Principle of color signal transmission and reception, PAL, NTSC, SECAM (block schematic description), Picture tube – delta gun.

UNIT V HIGH DEFINITION TV 9

Component coding ,MAC signals ,MAC encoding format ,scanning frequencies D2- MAC Packet Signal ,Duo-binary Coding ,HDTV Standards & compatibility ,colorimetric characteristics & parameters of HDTV LCD TV

System : LCD Technology , LCD Matrix types & operations , LCD screen for TV LCD color Receiver Plasma TV System : Plasma & conduction of charge ,Plasma TV screen ,Signal processing in Plasma TV, Plasma colour Receiver Satellite TV, DTH Receiver System ,CCTV, CATV, working of block converter,: IR Remote control

Total 45 Hrs

g) Learning Resources

Text Books

1. Modern Television Practice – Principles, Technology and Service – R.R. Gulati, New Age International Publication, 2002
2. Monochrome and Colour TV – R.R. Gulati, New Age International Publication, 2002.

Reference Books

1. Colour Television Theory and Practice – S.P. Bali, TMH, 1994.
2. ision and Video Engineering - A.M. Dhake, 2nd Edition