

GOVERNMENT POLYTECHNIC, PUNE
(An Autonomous Institute of Govt. of Maharashtra)

Programme	:	Diploma in ET/CE/EE//ME/MT/CM/IT/DDGM
Programme Code	:	01/02/03/04/05/06/07/08/16/17/21/22/23/24/26
Name of Course	:	Audio Video Engineering
Course Code	:	ET482

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation Scheme:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Three class tests, each of 60 minutes	3 Hrs.	3 Hrs.	3 Hrs	--
Marks	20	80	--	25	--

Course Rationale:

This subject is introduced with view that the students are made familiar with Audio Video Communication Systems.

Course Objectives:

After studying this course, the student will be able to

•	Understand operation of audio amplifiers
•	Analyze quality of reception of various sound systems and graphic equalizer
•	Understand working of Hi-Fi System, P A system
•	Understand CD, DVD and BDR player mechanism.
•	Understand the principle of operation of various advanced TV systems.
•	Understand working of colour T.V., CCTV, Cable TV.

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Course Content:

Chapter No.	Name of Topic/Sub topic	Hrs	Marks
1.	Hi-Fi System,P A system		
	<p>Hi Fi Audio Amplifier</p> <p>1.1 Introduction to Amplifiers: Mono, Stereo, 1.2 Difference between stereo amplifier & Mono amplifier. 1.3 Hi-Fi sound System –Characteristics,Block diagram of Hi Fi amplifier & explanation 1.4 Controls available on it & its function & other facility available on it like (Mic in, Aux.in, earphone in) 1.5 Parametric equalizer-concept, Graphic equalizer- concept, circuit diagram and operation. (5 Point Circuit diagram) 1.6 Dolby NR recording system 1.7 Types of speaker –I) woofer, II) Mid-range,III) Tweeter 1.8 Cross over network- Definition, need, Types, circuit & its function, 1.9 Baffles- Definition, need , Types & there function Public Address system 1.10 Need and use 1.11 Block Diagram, operation 1.12 Requirements of a Public Address system 1.13 Typical installation planning for 1.13.1 Auditorium 1.13.2 Sports Ground 1.13.3 Sports Stadium etc.</p>	08	14
2.	Optical Recording		
	<p>2.1 Types of Optical recording 2.2 Methods of optical recording of sound on Film 2.3 Reproduction of sound from films Compact disc(CD) 2.4 Compact disc-Optical recording on disc 2.5 CD- material used, size 2.6 CD structure 2.7 Principle & working of detection used in CD player. 2.8 CD Encoding and its process 2.9 Component used for CD mechanism. I) CD pick-up assembly,II) gear system, III) drive motors, IV) CD lens. 2.10 Block diagram of CD player & explanation. 2.11 Function of controls. 2.12 Parts, function of remote control (transmitter unit) 2.13 Advantages and disadvantages of CD player 2.14 Advantages of florescent display system used in CD player. 2.15 Block diagram of CD, VCD player & explanation. DIGITAL VIDEO DISC(DVD) 2.16 DVD forum 2.17 DVD formats</p>	07	12

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	<p>2.18 Techniques used to increase capacity in DVDs 2.19 Features of DVDs 2.20 Applications of DVDs BLU-RAY DISC(BD) 2.21 Need for high density discs 2.22 Development of new disc based on Blue laser 2.23 Advantages of BD as a storage medium 2.24 Block diagram of BD player 2.25 Comparison of VCD,DVD,BD</p>		
3.	TV Fundamentals		
	<p>3.1 Concept & explanation of following: Aspect ratio, image continuity, sequential scanning, interlace scanning, scanning periods – horizontal & vertical, vertical resolution, horizontal resolution. 3.2 Vestigial sideband transmission, bandwidth for Colour signal, brightness, contrast, viewing distance luminance, hue, saturation, compatibility. 3.3 Colour theory, primary colours & secondary colors, Grassman’s law, additive Colour mixing, subtractive Colour mixing. 3.4 Composite Video Signal explain with waveform: Pedestal height, Blanking pulse, Colour burst, Horizontal sync pulse details, Vertical sync pulse details, Equalizing pulses, CCIR B standards for Colour signal transmission & reception. 3.5 TV channel allocation for band I & band III.</p>	08	14
4.	TV Transmitters & Receiver		
	<p>4.1 Audio and Video signal transmission 4.2 Positive and Negative modulation 4.3 Merits and Demerits of Negative modulation 4.4 Introduction to television camera tube (working & principle only) a) Vidicon b) Plumbicon c) Solid State camera based on CCD. 4.5 Color Picture tube (working & principle only). a) PIL b) Delta gun picture tube. 4.6 Block diagram of monochrome TV transmitter (Function of each block) 4.7 Block diagram of Colour TV transmitter. 4.8 Block diagram of monochrome TV Receiver.</p>	10	15
5.	Colour TV		
	<p>5.1 Block Diagram & operation of color TV receiver (PAL D type) 5.2 Yagi Uda Antenna. 5.3 Explain block diagram of PAL-D decoder. 5.4 Circuit diagram and operation of 5.4.1 chroma signal amplifier, 5.4.2 Burst pulse and Blanking pulse, 5.4.3 Colour killer control,</p>	10	15

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	<p>5.4.4 Basic Circuit for Separation of U & V signals. 5.4.5 AGC Amplifier. 5.4.6 Colour signal matrixing, 5.4.7 RGB drive amplifiers. 5.5 EHT generation: circuit explanation for line output stage using transistor or IC in Colour TV. 5.6 Comparisons between NTSC, PAL & SCAM Systems. 5.7 HDTV: Development of HDTV, NHK , MUSE System and NHK Broadcast. 5.8 LCD/LED Technology: Principle and working of LCD and LED TV 5.9 Plasma: Display basics, What is plasma , Inside display gas, electrodes and phosphor ,Advantages of plasma</p>		
6.	Non Radiating Video Systems		
	<p>6.1 Working principle & specification of following components: Dish antenna, LNBC, Multiplexer, Attenuators Connectors (two ways & three ways), Amplifier & cable. 6.2 Master Antenna Television –Block Diagram and operation 6.3 Cable Television- Block Diagram and operation of plan of typical CATV system, Channels for CATV, Pay TV through cables, Block diagram of two way cable systems and function of each block, Digital CATV, Applications of CATV 6.4 Closed Circuit Television- Block diagram of CCTV and its working, Application of CCTV 6.5 Block diagram of dB meter with working principle. 6.6 Direct to Home System (DTH)- Introduction , Block diagram of Transponder for DTH and its working, Block diagram of DTH receiver and function of each block.</p>	08	10
	TOTAL	48	80

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List of Practical/Experiments/Assignments:

Sr. No.	Name of Experiment/Assignment(Any 8 Practicals From 1to13)
1.	Trace and analyze voltage of Hi –Fi amplifier system. a) Trace the output stage of given Hi Fi amplifier system. b) Voltage analysis of a given Hi Fi amplifier.
2.	Fault Finding (three different faults) in a Hi Fi Audio amplifier: a) By Signal injection method. b) Confirmation of faulty stage by voltage analysis method.
3.	Study installation of PA system
4.	Plot frequency response of a) Graphic equalizer and b) Filters used in graphic equalizer
5.	Draw & study the drive mechanism ,layout of CD Player
6.	Fault finding in CD Player
7.	Study of DVD Player
8.	Trace: a) Chroma Section, b) Picture Tube, c) Video Amplifier
9.	Trace: a) Horizontal section b) Vertical section c) Power supply section of TV receiver
10.	Voltage analysis of: a) Chroma section b) Picture Tube c) Video Amplifier a) Vertical Section b) horizontal section c) Power supply of TV receiver.
11.	Fault finding in given Colour TV: a) No colour b) Red Colour only c) Blue colour only d) Green color only e) Magenta color only f) Cyan only g) Yellow only h) No raster, No Sound.
12.	Fault finding in given Colour TV: a) Fault in HSYNC section. b) Fault in VSYNC section. c) Fault in SYNC separator. d) Fault in video amplifier.
13.	Trace the circuit layout of LED or LCD television receiver.
14.	To collect information about Set Top box used for Cable TV at home and Installation of DTH System.
15.	To estimate the cost and layout of Cable TV.
16.	To collect information about LED and LCD display used in TV.
17.	Visit to TV transmitter station and write report. (Or Recording and reproduction studio)

Instructional Strategy:

Sr. No.	Topic	Instructional Strategy
1.	Hi-Fi System & P.A.System	Class room teaching & Laboratory work
2.	CD and DVD Player	Class room teaching & Laboratory work
3.	Television	Class room teaching & Laboratory work

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Learning Resources:

I. Books:

Sr. No	Title	Author	Publication
1.	Television & Radio Engineering	A.M Dhake	Tata McGraw-Hill
2.	Modern TV Praticce (4th edition)	R.R Gulati	New age International
3.	Television Engineering and Video System	R.G Gupta	Tata McGraw-Hill
4.	Audio Video Systems	R.G Gupta	Tata McGraw-Hill
5.	Modern CD Player Servicing Manual	Manohar Lotia	BPB Publication
6.	Basic Television and Video System	Bernard Grob	Tata McGraw-Hill



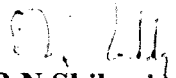
II. Websites:

- [http://en.wikipedia.org/wiki/Compact_Disc_player.](http://en.wikipedia.org/wiki/Compact_Disc_player)
- [http://en.wikipedia.org/wiki/High-definition_television.](http://en.wikipedia.org/wiki/High-definition_television)
- [http://www.howstuffworks.com.](http://www.howstuffworks.com)
- [http://en.wikipedia.org/wiki/Backlight.](http://en.wikipedia.org/wiki/Backlight)

Specification Table:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Hi-Fi System & P.A.System	6	4	4	14
2.	CD and DVD Player	5	3	2	10
3.	Television	7	4	5	16
4.	Satellite Communication	7	4	5	16
5.	Cable TV & Satellite TV	4	2	2	8
6.	Radar	6	5	5	16
Total		35	22	23	80

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