Ramgarhia Polytechnic College, Phagwara

Electronics and Communication Engineering Department

Head of Department: Er. Simranjit Singh

Name of the Faculty: Er. Gaganpreet Singh

Discipline: ECE

Semester: 5th

Subject: AUDIO VIDEO SYSTEMS

Lesson Plan Duration: 16 Weeks

RATIONALE

The objective of teaching this subject is to give students an in depth knowledge of various electronic audio and video devices and systems. Further this subject will introduce the students with working principles, block diagram, main features of consumer electronics gadgets/goods/devices. Which in-turn will develop in them capabilities of assembling, fault diagnosis and rectification in a systematic way

LEARNING OUTCOMES

After undergoing the subject, student will be able to:

CO1. Explain the working of loudspeakers and microphones.

CO2. Describe the basics of digital audio signals.

CO3. Describe the working of colour television system (PAL)

.

CO4. Describe Use the basic principles of digital video and its compression techniques

CO5 Illustrate basic techniques of digital television transmission and reception

CO6 Compare the working of LCD, LED, HDTV and plasma screen television.

CO7. Test color TV using pattern generator

PO ⇨ / CO ⇩	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1							
CO2							
CO3							
CO4							
CO5							
CO6							
CO7							

Syllabus

Units	Details	Hours
1.	Audio Systems 1.1. Microphones and Loudspeakers a) Carbon, moving coil, cordless microphone b) Direct radiating and horn loudspeaker c) Multi-speaker system	(06 hrs)
2.	Digital Audio Fundamentals Audio as Data and Signal, Digital Audio Processes Outlined, Time Compression and Expansion.	(05 hrs)
3.	Television 3.1. Basics of Television - Elements of TV communication system - Scanning and its need - Need of synchronizing and blanking pulses, VSB - Composite Video Signal 3.2 Colour Television - Primary, secondary colours - Concept of Mixing, Colour Triangle - Camera tube - PAL TV Receiver - NTSC, PAL, SECAM (brief comparison)	(10 hrs)
4.	Digital Video, Compression Techniques and Standards Digital Video, The RGB and YUV Representation of Video Signals, The Need for Compression, How compression works, Compression formats for video - MPEG-x format, H.26x format	(05 hrs)
5.	Digital Television-Transmission and Reception Digital satellite television, Direct-To-Home(DTH) satellite television, Digital TV receiver, Merits of digital TV receivers, Digital Terrestrial Television(DTT), Introduction to :Video on demand, CCTV, CATV with optical fibre.	(10 hrs)
6.	Liquid Crystal and Plasma Screen Televisions LCD technology, LCD matrix types and operation, LCD	(10hrs)

	screens for television, Plasma and conduction of charge, Plasma television screens, Signal processing in Plasma TV receivers, A Plasma colour receiver, LCD colour receivers, Single LCD receivers, 3-LCD colour receivers, Performance comparison of Plasma and LCD televisions, Introduction to LED TV, RGB dynamic LEDs, Edge-LEDs, Differences between LED-backlit and Backlit LCD displays, Comparison of Plasma TV and LED TV, Introduction to OLED TVs.	
7	Introduction to Projection Display Systems and Television Home Theaters.	(02 hrs)

Reference Books:

1. Modern Television Practice by R. R. Gulai; New Age International Publishers.

2. Audio Video Systems by R. G. Gupta; McGraw Hill Education System.

3. Television and Video Engineering by A. M. Dhake McGraw Hill Education System

4. Essential Guide to Digital Video by John Watkinson; Snell Wilcox Inc Publication

5. Guide to Compression by John Watkinson; Snell Wilcox Inc Publication

6. Audio Video Systems Principles Practices and Troubleshooting by Bali & Bali; Khanna Publishing Company

7. Consumer Electronics by S. P. Bali; Pearson Education, New Delhi

Delivery/Instructional Methodologies

Sr.No.	Description
1.	Chalk and Talk
2.	PowerPoint Presentation

Assessment Methodologies

Sr. No.	Description	Type
1.	Student Assignment	Direct
2.	Test	Direct
3.	Board Examination	Direct
4.	Student Feedback	Direct

Gaps in the syllabus - to meet industry/profession requirements

S.NO.	DESCRIPTION	PROPOSED ACTIONS	PO MAPPING
	N/A	N/A	N/A

Topics beyond syllabus/advanced topics

Units	Details	Hours
N/A	N/A	N/A

Web Source References

Sr. No.	URL
1.	https://nptel.ac.in/

Lesson Plan

Week	Theory		Practical	
	Lecture Day		Practical Day	
1st	1st	**Introduction to Microphones & Loudspeakers.** **Working construction of carbon microphone.**	**1.**	**To plot the directional response of a microphone.**
	2nd	**Working construction of moving coil & cordless microphone.**		
	3rd	**Working construction of Direct radiating loudspeaker**		
2nd	4th	**Working construction of horn loudspeaker**	**2.**	**To plot the directional response of a microphone.**
	5th	**Working construction of Multi speaker system.**		

	6th	**Introduction to digital Audio Fundamentals.**		**To plot the directional response of a Loudspeaker.**
3rd	7th	**Fundamentals of audio as data & signal.**	**3.**	**To plot the directional response of a Loudspeaker.**
	8th	**Fundamentals of audio as data & signal.**		
	9th	**Fundamentals of Digital Audio Processes Outlined**		
4th	10th	**Fundamentals of Digital Audio Processes Outlined.**	**4.**	**To plot the directional response of a Loudspeaker.**
	11th	**Time compression**		
	12th	**Time Expansion**		

				To test color TV using pattern generator.
5th	13th	**Introduction to Television.** **Basics of television.**	**5.**	**To study public address system and its components.**
	14th	**Elements of TV communication System.**		
	15th	**Scanning & its need**		
6th	16th	**REVISION**	**6.**	**To study public address system and its components.**
	17th	**REVISION**		
	18th	**Need of synchronization & blanking pulses.** **VSB(Vestigial Side Band).** **Compositie video signal.**		

7th	19th	**1st HOUSE TEST** **(TENTATIVE)**	**7.**	**Revision of practical 1&2.**
	20th	**PTM**		
	21st	**Introduction to colours.** • **Primary & Secondary colours** **Concept of Mixing, colours triangle** **Camera tube** **- PAL TV Receiver** **- NTSC, PAL, SECAM (brief comparison)**		
8th	22nd	**Digital Video, The RGB and YUV Representation of Video Signals,**	**8.**	**To test color TV using pattern generator.**
	23rd	**The Need for Compression, How compression works,**		
	24th	**Compression formats for video - MPEG-x format, H.26x format**		
9th	25th	**The Need for Compression**	**9.**	**To test color TV using pattern generator.**
	26th	**How compression works**		
	27th	**Compression formats for video - MPEG-x format, H.26x format**		
	28th	**Digital satellite television,**		

10th			10.	**Revision of Practical 5.**
	29th	**Direct-To-Home(DTH) satellite television**		
	30th	**Digital TV receiver, Merits of digital TV receivers,**		
11th	31st	**Digital Terrestrial Television(DTT),**	11.	**To perform fault identification in Colour TV.**
	32nd	**Introduction to :Video on demand, CCTV, CATV with optical fibre.**		
	33rd	**Introduction to LCD.** **LCD matrix types & operations.**		
12th	34th	**Introduction to :Video on demand,** **CCTV,** **CATV with optical fibre.**	12.	**To perform fault identification in Colour TV.**
	35th	**Signal processing in Plasma TV receivers.** **A Plasma colour receiver,**		
	36th	**LCD colour receivers,** **Single LCD receivers,**		
	37th	**3-LCD colour receivers,**	13.	**Revision Of Practical 3rd & 4th**

13th	38th	**REVISION**	**13.**	**Revision Of Practical 3rd & 4th**
	39th	**2nd Sessional Test (Tentative)**		
14th	40th	**Performance comparison of Plasma and LCD televisions,**	**14.**	**Revision Of Practical 5th**
	41st	**Introduction to LED TV** **RGB dynamic LEDs, Edge-LEDs,** **Differences between LED-backlit and Backlit LCD displays,**		
	42nd	**Comparison of Plasma TV and LED TV, Introduction to OLED TVs.**		
15th	43rd	**2nd Sessional Test (Tentative)**	**15.**	**Viva Voce of practical 1st ,2nd , & 3rd**
	44th	**PTM**		

	45th	**Introduction to Projection Display Systems and Television Home Theaters**		
16th	46th	**Introduction to Projection Display Systems and Television Home Theaters**	**16.**	**Revision**
	47th	**REVISION**		
	48th	**3rd Sessional Test (Tentative)**		