Lok Jagruti Kendra University
University with a Difference

Diploma in Electronics & Communication Engineering

LJ Polytechnic

Course Code:25030604
Consumer Electronics

Programme / Branch Name			Diploma in Electronics and Communication Engineering			
Course Name	Consumer Electronics				**Course Code**	25030604
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses BSC: Basic Science Courses
ESC: Engineering Science Courses PCC: Program Core Courses
OEC: Open Elective Courses PEC: Program Elective Courses

1) Teaching and Evaluation Scheme

Teaching Hours / Week / Credits				Evaluation Scheme			
L	**T**	**P**	**Total Credit**	**CCE**	**SEE (Th)**	**SEE (Pr)**	**Total Marks**
4	0	2	5	40	50	50	150

Legends:
L: Lectures T: Tutorial P: Practical
CCE: Continuous & Comprehensive Evaluation
SEE (Th): Semester End Evaluation (Theory)
SEE (Pr): Semester End Evaluation (Practical)

2) Prerequisite

- ✓ Knowledge of basic component of electronic.
- ✓ Rules and formula apply for the component connection.

3) Rationale

In developing nations demand of consumer electronic appliances is increasing day by day. This requires large number of technically trained men power in relevant industries. Looking towards the need of the country, in-depth knowledge for maintaining various electronics audio-video systems and home appliances is necessary for diploma engineering students. This subject will introduce the students with working principles, block diagram and advance features of consumer electronics appliances like audio-video systems, microwave oven, washing machine, air-conditioner, camcorder etc. which in-turn will develop skills to diagnosis fault and rectification of that in systematic way. Knowledge so gained would also help in working in production units of these consumer gadgets. Students may also start their own repair workshops and may engage in fruitful self-employment.

4) Objectives

- ✓ Troubleshoot different types of microphones.
- ✓ Troubleshoot audio systems
- ✓ Test working of various colour TV
- ✓ Troubleshoot colour TV receivers.
- ✓ Maintain various electronic home appliances.

5) Contents

Unit No.	Unit Name	Topics	Learning Outcomes	% Weightage	Hours
1	**Audio Fundamentals and Devices**	1.1. Basic characteristics of sound signal, Audio level metering, decibel level in acoustic measurement. 1.2. Microphone & Types, speaker types & working principle, Sound recording principle & types 1.3. Loud speaker: working principle, characteristic impedance, watt capacity, types 1.4. Sound recording: Optical recording, stereophony and multichannel sound, MP3 standard	• Describe the fundamental audio signal characteristics: sound • intensity, pitch, fidelity and loudness • Describe the method of sound intensity measurement • With sketches describe • operating principles of different types of microphones • With sketches describe • operating principles of different types of loud speakers • Explain optical sound recording process • Compare stereophony and • multichannel sound recoding • Describe MP3 standard • Describe the troubleshooting • procedure of audio devices	30	10
2	**Audio Systems**	2.1. Audio Amplifiers: types, characteristics, PMPO, Hi-Fi 2.2. Public Address System: Block diagram, requirement, installation, types 2.3. Optical Recording: types, methods, reproduction. CD, DVD, comparison of compact discs and conventional	• Describe the working of the digital console with a block diagram • Select a PA address system configuration for different configurations • Describe the troubleshooting procedure of audio systems.	10	10
3	**Television Fundamentals**	3.1. Elements of TV communication, scanning, synchronization, aspect ratio, pixels, resolution. 3.2. Modulation of video signals	• Describe scanning process with the help of suitable sketch • Differentiate salient features of monochrome and colour TV camera • Explain various components of	20	12

		3.3. Modulation of audio signals 3.4. Picture tubes: colour, monochrome 3.5. Luminance signal, chrominance signal	composite video signal with suitable sketch • Differentiate between hue, brightness, saturation, luminance and chrominance • Describe the working of colour TV camera • Describe the troubleshooting procedure of a typical TV camera		
4	**Television Standards and Video Systems**	4.1. TV standards: Types, similarities and variations 4.2. Digital TV: LCD, LED, PLASMA, HDTV, 3-D TV, projection TV, DTH receiver. 4.3. Video interface: Composite, Component, Separate Video, Digital Video, SDI, HDMI, Digital Video Interface	• Describe functioning of colour TV receiver with the help of block diagram • Explain working of flat panel displays • Describe working of DTH receiver. • Identify various interfaces available in digital TV receivers	30	12
5	**Home / Office Appliances**	5.1. FAX and Photocopier 5.2. Microwave Oven: types, single chip controllers, wiring and safety instructions, technical specifications 5.3. Washing Machine: wiring diagram, electronic controller for washing machine, specifications, types of washing machine 5.4. Air conditioner and Refrigerators: Components features, applications, and technical specification 5.5. Computer and Printer: Types, parts and installation.	• Describe working of FAX and photocopier machine with its specifications • Explain working of Microwave oven with sketches and specification • Describe working of washing machine with sketches • Discuss electronic control blocks of Air conditioner and Refrigerators • Computer parts and installation • Printer types and working	10	12

6) List of Practical / Exercises

The practical/exercises should be properly designed and implemented in an attempt to develop different types of skills that students can acquire the competencies/Programme outcomes. Following is the list of practical exercises for guidance.

Sr. No	Practicals / Exercises	Key Competency	Hours
1	Measure audio intensity level with the help of suitable audio level meter	Audio system	2
2	Build Test 2 channel audio power amplifiers.	Audio amplifier	2
3	Build Test sound mixer circuit	Signal mixer	2
4	To obtain composite video signal by using TV pattern generator and measure its dimensions	TV block diagram	2
5	To visualize / compare the various patterns of colour TV pattern generator for fault finding	TV circuit diagram	2
6	Verify the performance of various LED TV. Compare performance parameters of at least three brands.	Types of TV	2
7	Explore the various functions of automatic washing machine and locate various sensors used in that washing machines	Washing machine	2
8	Check the wiring of ACs and explore all the functions	AC Circuit	2
9	Test various functions of microwave oven	Microwave block diagram	2
10	To build and test temperature control system	Sensor	2
11	To build and test circuit for AC motor control	Sensor, Motor	2
12	Installation of desktop computer system.	Computer parts	2

7) Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Distribution of Topics According to Bloom's Taxonomy					
		R %	U %	App %	C %	E %	An %
1	Audio Fundamentals and Devices	30	40	10	10	10	0
2	Audio Systems	20	10	10	20	20	20
3	Television Fundamentals	20	20	20	0	20	20
4	Television Standards and Video Systems	10	30	20	0	20	20
5	Home / Office Appliances	30	30	0	0	20	20

Legends: R-Remembering C- Creating
U- Understanding E- Evaluating
App- Applying An- Analyzing

8) Textbook

1) Audio and Video Systems: Principles, Maintenance and Troubleshooting, by R G Gupta, TMH Publication.

9) Reference Books

1) Consumer Electronics, Bali S.P. Pearson Education India, latest edition
2) Modern Television practices, Gulati R.R, New Age International Publication

10) Open Sources (Website, Video, Movie)

1) https://archive.nptel.ac.in/course.html
2) https://ekumbh.aicte-india.org/allbook.php