

Rajasthan Skill & Livelihoods Development Corporation

1. Module Name	Repair & Maintenance of Intercom System
2. Sector	Electronics
3. Entry Qualification	Minimum 10 th Pass
4. Minimum Age (in years)	15
5. Duration	54 days/ 324 hrs.
6. Provision of Tool kit	Yes
7. Terminal Competency	<p>After completion of training the trainee will be able to</p> <ul style="list-style-type: none"> • use multimeter; • test active and passive components, transformers and semiconductors; • undertake soldering and de soldering of components; • assemble and test rectifier circuits, amplifier circuits and audio power amplifier; • install and maintain UPS and inverter; • charge and test batteries; • check and maintain power supply; • identify various tone signals used in telephones; • test & replace microphone, speaker and other components in the protection circuit and ringer circuit; • identify and fix various adaptors, connectors and sockets; • setup an intercom network with EPABX and repair Electronic Push button Telephones; • set the call transfer, call wait and other facilities available on EPABX; and • trace the wiring and locate the fault in the extension wiring circuit.

	Approx. hrs.
8. Registration, Inauguration, introduction and objectives of the course	2

9. Course content			
Practical competencies	Approx. hrs.	Underpinning Knowledge (Theory)	Approx. hrs.
• Practice procedure for electrical and personal safety measures.	2	• Electrical and personal safety, dangers and preventions.	1
• Use of multimeter.	2	• Multimeter and its various application.	1
• Testing of active and passive components.	3	• Basics of electricity – define DC, AC// Practical measuring units of voltage, current, resistance. • Types of transformers – its construction, testing.	3
• Testing of transformers.	3	• Testing of proper earth using test lamp.	1

• Testing of semiconductor components.	3	• Testing of earth using multimeter.	2
• Testing of unregulated and regulated voltages.	3	• Fuse – Types, use of fuses and its rating.	2
• Soldering and de-soldering techniques.	6	• Basic Electronics – passive and active components – testing of components, MOSFET – precautions when handling.	3
• Assemble and test rectifier circuits – half wave, full wave & bridge rectifier.	6	• Application of transistor – its uses.	2
• Assemble a power amplifier circuit (common emitter, emitter follower).	9	• Op-Amp – Introduction, applications, constructions, comparators.	2
• Assemble and test an audio power amplifier (buzzer).	9	• Voltage Regulator and their types.	2
• Construct a RC – oscillator and test it.	9	• DIAC, SCR, TRIAC – application.	2
• Find the total load and select a suitable UPS/ Inverter (rating factor).	3	• Digital Electronics – gates and its application, multiplexers, demultiplexers, counter.	3
• Installation of UPS and Inverter.	6	• Electrical load their VA and watts. • Various types of batteries used in UPS and inverters and their maintenance.	3
• Maintenance of Battery.	3	• Single phase and three phase system, different types of inverter, UPS, Working principle, specifications, explanation with the help of block diagram, basic principle of working of power switches, testing methods, discussions of various faults, diagnosing methods, rectifying common faults.	6
• Opening & dismantling an equipment and identifying the major parts, testing of major components, identifying transformers and checking, checking of power modules, Charging, discharging and testing of batteries, repairing of SMPS, simulating various faults diagnosing and rectifying it.	18		
• Practice procedure for safety and health hazard measures.	2	• Electrical and personal safety, dangers and preventions.	1
• Test the components used in the pushbutton telephone.	12	• Identify the components used in Push button telephone.	2
• Identify the various tone signals used in the phones.	6	• Understand the various tones used in the phone circuits.	3
• Testing of microphone and speaker.	12	• Use of microphone and speaker.	2
		• Differentiate pulse dialing and tone dialing and their applications.	3
• Testing & replacing components in the protection circuit and ringer circuit. • Identify the faulty component and replace in the dialer circuit and speech circuit.	18	• Functions of the dialer circuit and speech circuit.	3

<ul style="list-style-type: none"> • Test the key pad for proper function and repair the key pad problems. • Test and identify the fault in a pushbutton telephone. 	18	<ul style="list-style-type: none"> • Testing methods of pushbutton telephone for proper functions. 	3
<ul style="list-style-type: none"> • Identify and fix various adaptors, connectors and sockets. 	18	<ul style="list-style-type: none"> • Use of various adaptors, connectors and sockets used in the telephone circuits. 	3
<ul style="list-style-type: none"> • Identify the terminals of trunk line and extension line and connect the extensions. 	15	<ul style="list-style-type: none"> • Methods to connect the trunk line and extension line in an EPABX. 	3
<ul style="list-style-type: none"> • Setting the call transfer, call wait and other facilities available on EPABX. 	12	<ul style="list-style-type: none"> • Call wait, call transfer, conference facility available in an EPABX. 	3
<ul style="list-style-type: none"> • Trace the wiring and locate the fault in the extension wiring circuit. 	12	<ul style="list-style-type: none"> • Read wiring circuit and understand the wiring of extension circuits. 	3
		Entrepreneurship & Soft Skills and Computer Literacy Module:	0
		<ul style="list-style-type: none"> • Entrepreneurship – its necessity and charms of being an entrepreneur. 	1
		<ul style="list-style-type: none"> • Who is an entrepreneur and characteristics of a successful Entrepreneur? 	2
		<ul style="list-style-type: none"> • How to identify Business opportunities? 	2
		<ul style="list-style-type: none"> • Steps for setting up a small scale venture. 	1
		<ul style="list-style-type: none"> • Institutional support for entrepreneurship (whom to contact for what) 	2
		<ul style="list-style-type: none"> • Government (Central/ State) Schemes and assistance from Banks/ other financial institutions - Procedures and formalities for getting loan. 	2
		<ul style="list-style-type: none"> • How to prepare Business plan? 	2
		<ul style="list-style-type: none"> • Financial literacy-Costing, Pricing, Profitability and Break Even Analysis. 	2
		<ul style="list-style-type: none"> • Cash management in small enterprises. 	2
		<ul style="list-style-type: none"> • Accounting and Book Keeping 	2
		<ul style="list-style-type: none"> • Introduction to Taxation 	1
		<ul style="list-style-type: none"> • Shop and Establishment Act and its provisions. 	1
		<ul style="list-style-type: none"> • Creativity, Problem solving & decision making. 	1
		<ul style="list-style-type: none"> • Common mistakes generally made by entrepreneurs. 	1

		<ul style="list-style-type: none"> Interaction with successful entrepreneur and success stories. 	2
		<ul style="list-style-type: none"> Communication and Negotiation skills. 	1
		<ul style="list-style-type: none"> Interpersonal skills 	1
		<ul style="list-style-type: none"> How to Deal with customer attitude – Effective selling. 	1
		<ul style="list-style-type: none"> Marketing – Basic concepts/ Skills and effective mode of advertising. 	1
		<ul style="list-style-type: none"> Introduction to e-commerce. 	2
Computer Fundamentals Customize the Desktop Environment e.g. Desktop, Start Menu, and Taskbar etc. Configuring & Migrating Files, Folders & Settings - Folder Views, Accessibility Settings	2	Computer Fundamentals, MS-Office & Internet introduction to Computers History of Computers Components of Hardware Peripherals	1
MS Word Creating, Organizing & Formatting Content Collaborating – Merge, Insert, View, Edit, Track Mode etc. Formatting & Managing Documents	4	Concept of Operating System – Windows XP, Exploring & Configuring the Windows XP Desktop Environment-Customize the Desktop, Start Menu, and Taskbar etc. Configuring & Migrating Files, Folders	1
MS Excel Creating, Analyzing & Formatting Data & Content Collaborating - Insert, View, Edit etc. Managing Workbooks	3	Settings - Folder Views, Accessibility Settings Features of Windows XP Understanding concepts of Word processing using MS-Word Understanding concepts of Electronic spreadsheet and various types of entries in it	1
MS PowerPoint Creating & Formatting Content Collaborating - Track, Edit, Add, Delete Comments, Merge Managing & Delivering Presentations	3		
Internet Concepts Opening websites and downloading data Writing, reading and sending emails	4	Understanding concepts of URL Creating and Opening an E-mail account. Receiving and sending emails Searching information on Internet.	1
Approx. Total Practical hours	226	Approx. Total Theory hours	96
Grand Total (2+226+96)			324

10. Tools, Equipments and Material for a batch of 30 trainees		
S.No.	Item	Quantity
1	Inverter / UPS Trainer	1
2	Battery Charger	1

3	Technicians tool kit comprising of all tools required in repair and maintenance of Basic electronic items	6
4	Digital multi-meter	6
5	Soldering / De-soldering temp controlled station	6
6	Clip on ammeter	6
7	Soldering gun	6
8	De-soldering Pump	6
9	SMD Soldering tools	6
10	Antistatic mat with proper grounding and wrist band	As required
11	EPABX of 2+6 Line	1
12	EPABX of 2+10 Line	1
13	Pushbutton telephones	6
14	Telephone analyzer	3
15	Crimping tool	6
16	Multimeter	6

S.No.	Item	Quantity	S.No.	Item	Quantity
	Hardware			Software:	
1	Computers/Laptops	10 (one for three trainee)	6	Microsoft Windows 7/8/10 or UNIX/ LINUX or latest software	For all Systems
2	Power backup	For all Systems	7	Microsoft Office 2007/ 2010/ 2013 or latest software	For all Systems
3	Inkjet/Laser Printer (Network/USB Printer)	1	8	Antivirus Software (TVD/ Norton/ Quick Heal Total Security/ Kaspersky/ Any Popular brand)	For all Systems
4	Speaker	1	9	Internet Connection	For all Systems
5	Spare H/W components	As per requirement			