

WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
SYLLABUS FOR CLASSES XI AND XII
JOB ROLE: FIELD TECHNICIAN OTHER HOME APPLIANCES

COURSE OVERVIEW

Field Technician Other Home Appliances, is a technician who is responsible to provide after sales support in terms of Installation, Repair, Maintenance and Replacement of dysfunctional part of the Home Appliances such as Water Purifier, Mixer, Grinder, Juicer, Microwave Oven and similar other appliances.

The technician has an expertise in Fundamentals of Electrical and Electronics Engineering with exposure to install these appliances at the customer site. This technician can also provide the guidance to the customer for purchasing these appliances as per the requirement or site condition of the customer. They provide after sales support and resolve the problems occurring in these appliances. They do the regular maintenance and servicing of these appliances. They interact with customers to diagnose the problem and possible causes. Once the problem and causes have been identified, the individual rectifies minor problems or replaces faulty modules for failed parts or recommends factory repairs for bigger faults.

The technician must be willing to work in the field and travel through the day from one customer's premise to another. Punctuality, amenable behaviour, patience, good interpersonal relationship building, trustworthiness, integrity, and critical thinking are important attributes for this job.

COURSE OUTCOME:

On completion of the course, students should be able to:

- Apply effective oral and written communication skills to interact with customers;
- Identify the principal components of a computer system;
- Demonstrate the basic skills of using computer;
- Demonstrate self-management skills;
- Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills;
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- Describe the duties and responsibilities of Technician;
- Describe the basics of Electrical and Electronics;
- Demonstrate the basic skills of Electrical and Electronics;
- Use hand tools, power tools, equipment and measuring instruments;
- Describe the pre-installation tasks of home appliances;

- Connect and operate appliances – Water Purifier, Mixer, Grinder, Juicer, Microwave Oven;
- Repair or Replace the dysfunctional part of appliances – Water Purifier, Mixer, Grinder, Juicer, Microwave Oven;
- Check the functionality of appliances after repair or replacement of dysfunctional part;
- Demonstrate various practices to be followed to maintain health and safety at work;
- Work effectively and safely at the workplace.

COURSE STRUCTURE

JOB ROLE: FIELD TECHNICIAN OTHER HOME APPLIANCES SECTOR: ELECTRONICS										
Class	Semester	Contact Hours						Marks		
		Employability Skills	Domain Theory	Domain Practical	Practical Exam	Project	Total	Theory		Practical
XI	I	55	35	55	-	-	145	25	Sum of Sem I & Sem II = 50	NIL
	II	35	24	36	10	15	120	25		50
XII	III	55	30	50	-	-	135	25	Sum of Sem III & Sem IV = 50	NIL
	IV	35	30	40	10	15	130	25		50

JOB ROLE: FIELD TECHNICIAN OTHER HOME APPLIANCES**Class XI [Total Theory Marks 25]****Class XI SEMESTER I TOPICS: (MCQ) MARKS: 25 [1 MARK PER QUESTION]**

SL No.	Topic	Tuition Hours	Marks Allotted
	Part A: Employability Skills	55	
1	Unit 1: Communication Skill	20	2
2	Unit 2: Self-management Skill	15	2
3	Unit 3: ICT Skill	20	2
	Part B: Vocational Skills	90	
4	Unit 1: Fundamentals of Electrical and Electronics Engineering	50	11
5	Unit 2: Installation of the Water Purifier	40	8
Total		145	25

Class XI SEMESTER II TOPICS: [Short Answer Question, Descriptive Question] MARKS: 25

SL No.	Topic & Sub-Topics	Tuition Hours	Short Answer Type Question (8 Marks)	Descriptive Type Question (17 Marks)	Total
	Part A: Employability Skills	35			
1	Unit 4: Entrepreneurial Skill	20	1	2	3
2	Unit 5: Green Skill	15	1	2	3
	Part B: Vocational Skills	60			
3	Unit 3: Repair and Maintenance of Water Purifier	30	3	7	10
4	Unit 4: Work effectively at the workplace	30	3	6	9
	Part C: Practical Work	10			
5	Practical Examination	06			
6	Written Test	01			
7	Viva Voce	03			
	Part D: Project Work/Field Visit	15			
8	Practical File / Student Portfolio	10			
9	Viva Voce	05			
Total		120	8	17	25

JOB ROLE: FIELD TECHNICIAN OTHER HOME APPLIANCES**Class XII [Total Theory Marks 25]****Class XII SEMESTER III TOPICS: (MCQ) MARKS: 25 [1 MARK PER QUESTION]**

SL No.	Topic	Tuition Hours	Marks Allotted
	Part A: Employability Skills	55	
1	Unit 1: Communication Skill	20	2
2	Unit 2: Self-management Skill	15	2
3	Unit 3: ICT Skill	20	2
	Part B: Vocational Skills	80	
4	Unit 1: Repair and Maintenance of Mixer/ Grinder	40	9
5	Unit 2: Repair and Maintenance of Juicer	40	10
Total		135	25

Class XII SEMESTER IV TOPICS: [Short Answer Question, Descriptive Question] MARKS: 25

SL No.	Topic & Sub-Topics	Tuition Hours	Short Answer Type Question (8 Marks)	Descriptive Type Question (17 Marks)	Total
	Part A: Employability Skills	35			
1	Unit 4: Entrepreneurial Skill	20	1	2	3
2	Unit 5: Green Skill	15	1	2	3
	Part B: Vocational Skills	70			
3	Unit 3: Repair and Maintenance of Microwave Oven	40	3	6	9
4	Unit 4: Workplace Health and Safety Practices	30	3	7	10
	Part C: Practical Work	10			
5	Practical Examination	06			
6	Written Test	01			
7	Viva Voce	03			
	Part D: Project Work/Field Visit	15			
8	Practical File/ Student Portfolio	10			
9	Viva Voce	05			
Total		130	8	17	25

DETAIL SYLLABUS**CLASS - XI****SEMESTER – I**

Part A: Employability Skills			
Unit 1: Communication Skills – III			
Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	Duration (20 Hrs)
1. Demonstrate knowledge of communication	● Introduction to communication ● Importance of communication ● Elements of communication ● Perspectives in communication ● Effective communication	● Role-play on the communication process ● Group discussion on the importance of communication and factors affecting perspectives in communication ● Charts preparation on elements of communication ● Classroom discussion on the 7Cs (i.e. Clear, Concise, Concrete, Correct, Coherent, Courteous and Complete) for effective communication	03
2. Demonstrate verbal communication	● Verbal communication ● Public Speaking	● Role play of a phone conversation ● Group activity on delivering a speech and practicing public speaking	02
3. Demonstrate non-verbal communication	● Importance of non-verbal communication, ● Types of non-verbal communication, ● Visual communication	● Role plays on non-verbal communication ● Group exercise and discussion on Do's and Don'ts to avoid body language mistakes ● Group activity on methods of communication	02
4. Demonstrate speech using correct pronunciation	● Pronunciation basics, ● Speaking properly, ● Phonetics, ● Types of sounds	● Group activities on practicing pronunciation	01
5. Apply an assertive communication style	● Important communication styles, ● Assertive communication, ● Advantages of assertive communication, ● Practicing assertive communication	● Group discussion on communication styles, ● Group discussion on observing and sharing communication styles	02
6. Demonstrate the knowledge of saying no	● Steps for saying “No” ● Connecting words	● Group discussion on how to say ‘No’	01

7. Identify and use parts of speech in writing	- Capitalisation, - Punctuation, - Basic parts of speech, - Supporting parts of speech	- Group activity on identifying parts of speech, - Writing a paragraph with punctuation marks, - Group activity on constructing sentences, - Group activity on identifying parts of speech	02
8. Write correct sentences and paragraphs	- Parts of a sentence - Types of object - Types of sentences - Paragraph	- Activity on framing sentences - Activity on active and passive voice - Assignment on writing different types of sentences.	01
9. Communicate with people	- Greetings, - Introducing self and others	- Role-play on formal and informal greetings, - Role-play on introducing someone, - Practice and group discussion on how to greet different people	01
10. Introduce yourself to others and write about oneself	- Talking about self - Filling a form	- Practicing self-introduction and filling up forms - Practicing self-introduction to others	01
11. Develop questioning skill	- Main types of questions, - Forming closed and open ended questions	- Practice exercise on forming questions, - Group activity on framing questions.	01
12. Communicate information about family to others	- Names of relatives, - Relations	- Practice taking about family, - Role-play on talking about family members	01
13. Describe habits and routines	Concept of habits and routines	- Group discussion on habits and routines - Group activity on describing routines	01
14. Ask or give directions to others	- Asking for directions, - Using landmarks	- Role-play on asking and giving directions, - Identifying symbols used for giving directions	01
Unit 2: Self-management Skills – III			
Learning Outcome	Theory (08 Hours)	Practical (07 Hours)	Duration (15 Hrs)
1. Identify and analyze own strengths and weaknesses	- Understanding self - Techniques for identifying strengths and weaknesses	- Activity on writing aims in life - Prepare a worksheet on interests and abilities	02

	● Difference between interests and abilities		
2. Demonstrate personal grooming skills	● Guidelines for dressing and grooming ● Preparing a personal grooming checklist	● Role-play on dressing and grooming standards ● Self-reflection activity on various aspects of personal grooming	02
3. Maintain personal hygiene	● Importance of personal hygiene ● Three steps to personal hygiene ● Essential steps of hand washing	● Role-play on personal hygiene ● Assignment on personal hygiene	02
4. Demonstrate the knowledge of working in a team and participating in group activities	● Describe the benefits of teamwork, ● Working in a team	● Assignment on working in a team, ● Self-reflection on teamwork	02
5. Develop networking skills	● Benefits of networking skills, ● Steps to build networking skills	● Group activity on networking in action, ● Assignment on networking skills	01
6. Describe the meaning and importance of self-motivation	● Meaning of self-motivation, ● Types of motivation, ● Steps to building self-motivation	● Activity on staying motivated, ● Assignment on reasons hindering motivation	02
7. Set goals	● Meaning of goals and purpose of goal-setting, ● Setting SMART goals	● Assignment on setting SMART goals, ● Activity on developing long- term and short-term goals using SMART method	02
8. Apply time management strategies and techniques	● Meaning and importance of time management, ● Steps for effective time management	● Preparing checklist of daily activities	02
Unit 3: Basic ICT Skills – III			
Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	Duration (20 Hrs)

1. Create a document on the word processor	● Introduction to ICT, ● Advantages of using a word processor, ● Work with LibreOffice Writer	● Demonstration and practice of the following: ● Creating a new document ● Typing text ● Saving the text ● Opening and saving file in Microsoft word/Libre Office Writer	02
2. Identify icons on the toolbar	● Status bar, ● Menu bar, ● Icons on the Menu bar, ● Multiple ways to perform a function	● Group activity on using basic user interface of LibreOffice writer ● Group activity on working with Microsoft Word	02
3. Save, close, open and print document	● Save a document, ● Close a document, ● Open an existing document, ● Print a document	● Group activity on performing the functions for saving, closing and printing documents in LibreOffice Writer, ● Group activity on performing the functions to save, close and print documents	02
4. Format text in a document	● Change style and size of text ● Align text, ● Cut, Copy, Paste, ● Find and replace	● Group activity on formatting text in LibreOffice Writer, ● Group activity on formatting text in Microsoft Word	02
5. Check spelling and grammar in a word document	● Use of spell checker, ● Autocorrect	● Group activity on checking spellings and grammar using LibreOffice Writer ● Group activity on checking spellings and grammar using Microsoft Word	02
6. Insert lists, tables, pictures, and shapes in a word document	● Insert bullet list, ● Number list, ● Tables, ● Pictures, ● Shapes	● Practical exercise of inserting lists and tables using LibreOffice Writer	03
7. Insert header, footer and page number in a word document	● Insert header, ● Insert footer, ● Insert page number, ● Page count	● Practical exercise of inserting header, footer and page numbers in LibreOffice Writer ● Practical exercise of inserting header, footer and page numbers in Microsoft Word	03

8. Make changes by using the track change option in a word document	● Tracking option ● Manage option ● Compare documents	● Group activity on performing track changes in LibreOffice Writer ● Group activity on performing track changes in Microsoft Word	04
---	---	--	----

Part B: Vocational Skills**Unit 1: Fundamentals of Electrical and Electronics Engineering**

Learning Outcome	Theory (20 Hours)	Practical (30 Hours)	Duration (50 Hrs)
1. Describe the duties and responsibilities of Field Technician Other Home Appliances	● Size and scope of electronic industry and its sub-sectors, ● Role and responsibilities of Field Technician Other Home Appliances. ● Employment opportunities for a Field Technician Other Home Appliances.	● List various home appliances, ● Group activity to demonstrate and operate different types of appliances such as Water Purifiers, Mixer, Grinder, Juicer, Microwave Oven ● List the job opportunities for a Field Technician Other Home Appliances.	05
2. Describe electric circuits and electrical quantities	● Electricity, ● Types of electricity – AC, DC Potential and Potential difference, ● Electric Circuit ● Open and Closed Circuit, ● Series and Parallel Circuits, ● Parameters of Electric Circuit – Voltage Current, Resistance ● Measuring units of current, voltage and resistance, ● Ohm's law, ● Kirchhoff's law ● Power and Energy ● Power Calculation and Energy Consumption, ● Measurement of Electrical Parameters	● Read the voltage, current, resistance, power ratings of the appliances. ● Identify the live, neutral and earth ports of power socket, ● List, identify and name the electrical components, ● Identify and construct open and closed circuit, ● Identify and construct series and parallel circuit, ● List the measurement units of voltage, current, resistance, ● Verify the ohm's law by using ohm's experiment, ● Verify the Kirchhoff's law by using experiment, ● Demonstrate to calculate power and energy, ● Identify AC motors, DC motors	15
3. Describe the components of an electric circuit	● Components of an electric circuit – active and passive components, ● Active components – Diode, Transistor, Integrated Circuits, LED, ● Passive components – Transformer, Resistor, Capacitor, Inductor, Thermistor,	● Identify the components typically used in home appliances, ● List the active and passive components and draw their symbols, ● Determine the value of resistance by using color code, ● Test the continuity of given diode using multimeter ● Construct the circuit for	15

	● Electromechanical components – Motor, Printed Circuit Board (PCB), Connector, Switch, Relay, Circuit Breaker, Starter, Timer	forward and reverse bias of the diode and draw its characteristic curve ● Determine the input and output voltage of a given transformer, ● Demonstrate the working of LED, ● Demonstrate to verify the transistor as a switch, ● Demonstrate to verify the temperature resistance relationship of thermistor	
4. Use tools, equipment and measuring instruments	● Common hands tools – Cutter, Scissors, Screwdriver, Combination Plier, ● Electrical power tools – Power drills, Saws, Sanders, Grinders, Wrench, Rotary tubing or pipe cutter, Tubing bender, Tubing cutter ● Measuring instruments – Phase Tester, Earth Tester, Watt Meter, Energy Meter, Multi-meter, Clamp Meter ● Measurement of electrical quantities using multi-meter and clamp meter, ● Safety practices to use Tools, Equipment and Measuring instruments	● Group activity to use various hand tools, ● Demonstrate to test electronic component, ● Calculate the current flowing through resistance, ● Measure the electrical parameters using Multimeter – DC Voltage, DC Current, AC Voltage, AC Current, Resistance ● Measure the electrical parameters using Clamp meter – AC current, Temperature, AC voltage, Capacitance, DC voltage, Resistance, DC current, Frequency	15

Unit 2: Installation of Water purifier

Learning Outcome	Theory (15 Hours)	Practical (25 Hours)	Duration (40 Hrs)
1. Describe the basics of water based appliances	● Properties of Water – Universal Solvent, Neutral pH, High Polarity, Lower Density of Ice, ● Water Treatment, Methods, ● Water contaminants – Bacteria, Minerals, Particulates, Chemicals ● Water treatment agents – Chemicals, Filters, Purifiers, ● Water flow diagram and electrical circuit diagram of water purifier, ● Water purification process and different layers of filter present within the unit, ● Different technologies in water purification	● Group discussion on importance of water and its requirements, ● List the properties of water affecting water-based appliances ● List the various water treatment methods, ● Identify and list the different types of filters, ● Demonstrate the water purification process, ● Identify and label the parts of given filter.	10

2. Describe the functioning of Water Purifier	● Water Purifiers, Features and functionalities of various models, ● Types of Water Purifier – RO Water Purifiers, UF Water Purifiers, UV Water Purifiers, Gravity Based Water Purifiers, Activated Carbon Water Purifiers, ● Properties of RO Water Purifier, ● Component of RO Water Purifier, ● Functioning of RO Water Purifier.	● Group activity to identify and name the different water purifiers, ● Identify the different types of water purifiers, ● Identify the various components of water purifier, ● A role play activity – customer asked to tell the components of RO Water Purifier and you list all the components of water purifier, ● Demonstrate the functioning of water purifier	10
3. Describe the pre-installation process of Water Purifier	● Packaging of purifier unit and accessories. ● Unpacking process, ● Safety precautions to be taken while installing, ● Packaging waste disposal procedures ● Other products of the company. ● Operation of the water purifier, appropriate settings after plugging in, ● Use of various features. ● Structural requirements, ventilation, with safety precautions to be taken while installing.	● Demonstrate the process of disposing of the packaging material waste as per the company's norms, ● Check that the product specifications and other supporting accessories, ● Arrange tools and fitments required for the installation, ● Identify the structural requirements for installation of water purifier, ● Carry out pre-installations/ masonry/electrical work for of adequate water pressure at the inlet source, ● Make necessary markings for placement of the water purifier unit. ● Mount the filter and fastened the screws securely.	10
4. Install RO Water Purifier	● Safety precautions to be taken while installing water purifier, ● Manual-based procedure of installing the water purifier ● Procedure to fix various accessories and parts accompanied the unit, ● Post fixing check up process, ● Functioning of water purifier, ● Maintenance procedures, ● Documentation process of installation of water purifier	● Demonstrate to mount the filter and fastened the screws securely, ● Demonstrate to drain the inlet line before connecting it to the water purifier and connect the outlet pipe to the drain, ● Demonstrate to connect the purifier to the nearest power supply point, ● Illustrate to check the proper functioning of water purifier as per the desired standard, ● Demonstrate the regular maintenance of water purifier,	10

	● Customer acknowledgment form, ● Call center number.	● Demonstrate the documentation process and calling on the customer care number.	
--	--	--	--

DETAIL SYLLABUS**CLASS - XI****SEMESTER – II**

Part A: Employability Skills			
Unit 4: Entrepreneurial Skills – III			
Learning Outcome	Theory (07 Hours)	Practical (13 Hours)	Duration (20 Hrs)
1. Differentiate between different kinds of businesses	● Introduction to entrepreneurship ● Types of business activities	● Role play on different kind of business around us	02
2. Describe the significance of entrepreneurial values	● Meaning of value, ● Values of an Entrepreneur, ● Case study on qualities of an entrepreneur	● Role play on qualities of an Entrepreneur	02
3. Demonstrate the attitudinal changes required to become an entrepreneur	● Difference between the attitude of entrepreneur and employee	● Interviewing employees and entrepreneurs	02
4. Develop thinking skills like an entrepreneur	● Problems of entrepreneurs ● Problem-solving, ● Ways to think like an entrepreneur	● Group activity on identifying and solving problems	03
5. Generate business ideas	● The business cycle, ● Principles of idea creation, ● Generating a business idea, ● Case studies	● Brainstorming on generating a business ideas	03
6. Describe customer needs and importance of conducting a customer survey	● Understanding customer needs ● Conducting a customer survey	● Group activity to conduct a customer survey	04
7. Create a business plan	● Importance of business planning, ● Preparing a business plan, ● Principles to follow for growing a business, ● Case studies	● Group activity on developing a business plan	04
Unit 5: Green Skills – III			
Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	Duration (15 Hrs)
1. Describe the importance of the main sector of the green economy	● Meaning of ecosystem, food chain and sustainable development ● Main sectors of the green economy- E-waste management, green transportation, renewal energy, green construction, and water management	● Group discussion on sectors of green economy, ● Poster making on various sectors for promoting green economy	06

2. Describe the main recommendations of policies for the green economy	● Policies for a green economy	● Group discussion on initiatives for promoting the green economy, ● Writing an essay or a short note on the important initiatives for promoting green economy.	03
3. Describe the major green sector/area and the role of various stakeholders in the green economy	● Stakeholders in the green economy	● Group discussion on the role of stakeholders in green economy ● Preparation of posters on green sectors and their stakeholders ● Making solar bulbs.	03
4. Identify the role of government and private agencies in the green economy	● Role of the government in promoting a green economy, ● Role of private agencies in promoting green economy	● Group discussion on the role of Government and Private Agencies in promoting a green economy. ● Posters making on green sectors.	03

Part B: Vocational Skills

Unit 3: Repair and Maintenance of Water purifier

Learning Outcome	Theory (12 Hours)	Practical (18 Hours)	Duration (30 Hrs)
1. Identify the fault in water purifier	● Parameters such as production rate, water chemistry, drain rate, input water pressure/temperature ● Different types of water purifiers manufactured by the company, ● Features of different models of water purifier.	● Diagnose the fault based on customer interaction and initial inspection ● Demonstrate to check the water pressure, ● Carry out basic inspection of feed water valve, tank valve, tubing, housing etc. ● Demonstrate to identify the fault on part basis inspection.	10
2. Replace dysfunctional part in the water purifier unit	● Functioning of appliance and its various filters. ● Components of water purifier – valves or wearing out of membrane or filter ● Troubleshooting of water purifier, ● Frequently occurring faults such as low/no water production, leaks, bad tasting water.	● Demonstrate to replace the damaged components – valves or wearing out of membrane or filter ● Demonstrate to remove and replace the faulty module with a functional one.	10

3. Confirm functionality of the repaired unit	● Reassembly process, ● Components/modules of the water purifier, ● Other products of the company, ● Cleaning procedures and other best practices.	● Demonstrate to reassemble the unit, ● Check the functioning of all the units after reassemble, ● Demonstrate and confirm functionality of the unit, ● Demonstrate the cleaning procedures and other best practices.	10
Class XI, Unit 4: Work Ethics, Quality, Substantiality and Safety			
Learning Outcome	Theory (12 Hours)	Practical (18 Hours)	Duration (30 Hrs)
1. Achieve optimum productivity and quality	● Importance of cleanliness, air and water quality in the workplace, ● Importance of time management to meet daily target, ● Importance of Quality in delivery of work, ● Organization's policies and procedures and work ethics	● Group activity to keep work area clean and tidy, ● Prepare a to do list and demonstrate to complete work effectively in time to meet daily target, ● Check the quality of work with the expected standards, ● Group activity to comply with organization's policies and procedures	08
2. Explain the importance of implementing health and safety procedures	● Organisation safety and health policy, ● Appropriate Personal Protective Equipment (PPE) ● ESD precautions, ● Types of accident injury or hazard	● Group activity to observe and follow organisation safety guidelines, ● Demonstrate the use of proper personal protective equipment (PPE) for safety ● Demonstrate to observe ESD precautions, ● Identify and report any accident injury or hazard	08
3. Demonstrate the process of organizing waste management and recycling	● Recyclable/non-recyclable and hazardous wastes, ● Different waste categories – dry, wet, recyclable, non-recyclable and single use plastic items, ● Different colours of dustbins to dispose waste, ● Waste management and waste disposal procedures, ● Methods of recycling as well as repairing and reusing electronic components, ● Effect of greening of jobs	● Identify and segregate recyclable/non-recyclable and hazardous wastes, ● Group activity to dispose waste as per the procedures, ● Demonstrate to use appropriate colours of dustbins to dispose waste, ● Group activity to recycle, repair and reuse electronic components,	08

		● Participate in waste management and waste disposal workshops organized at workplace	
4. Explain the importance of conserving resources	● Efficient utilisation of material and water, ● Prevalent energy efficient devices, ● Common electrical problems, Cleaning of tools, machines and equipment ● Common practices of conserving electricity	● Group activity to demonstrate efficient utilization of resources, material and water, ● Make the list of equivalent energy efficient devices, ● Perform routine cleaning of tools, machines and equipment ● Demonstrate the common practices of conserving electricity.	06

DETAIL SYLLABUS**CLASS - XII****SEMESTER – III**

Part A: Employability Skills			
Unit 1: Communication Skills – IV			
Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	Duration (20 Hrs)
1. Demonstrate active listening skills	● Active listening - listening skill, stages of active listening, ● Overcoming barriers to active listening	● Group discussion on the factors affecting active listening, ● Preparing posters of steps for active listening, ● Role-play on negative effects of not listening actively	07
2. Identify the parts of speech	● Parts of speech – using capitals, punctuation, basic parts of speech, supporting parts of speech	● Group practice on identifying parts of speech ● Group practice on constructing sentences	07
3. Write sentences	● Writing skills to practice the following: ● Simple sentence ● Complex sentence ● Types of object ● Identify the types of sentences ● Active and Passive sentences ● Statement/Declarative sentence ● Question/Interrogative sentence ● Emotion/Reaction or Exclamatory sentence ● Order or Imperative sentence	● Group activity on writing sentences and paragraphs, ● Group activity on practicing writing sentences in active or passive voice, ● Group activity on writing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative)	06
Unit 2: Self-management Skills – IV			
Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	Duration (15 Hrs)
1. Describe the various factors influencing motivation and positive attitude	● Motivation and positive attitude ● Intrinsic and extrinsic motivation ● Positive attitude – ways to maintain positive attitude ● Stress and stress management - ways to manage stress	● Role Play on avoiding stressful situation, ● Activity on listing negative situations and ways to turn it positive	06
2. Describe how to become result oriented	● How to become result oriented, ● Goal setting – examples of result-oriented goals	● Pair and share activities on the aim of life	03

3. Describe the importance of self-awareness and the basic personality traits, types and disorders	● Steps towards self-awareness ● Personality and basic personality traits ● Common personality disorders- ● Suspicious ● Emotional and impulsive ● Anxious ● Steps to overcome personality disorders	● Group discussion on self awareness ● Group discussion on common personality disorders ● Brainstorming steps to overcome personality disorder	06
Unit 3: Information and Communication Technology Skills – IV			
Learning Outcome	Theory (06 Hours)	Practical (14 Hours)	Duration (20 Hrs)
1. Identify the components of a spreadsheet application	● Getting started with spreadsheet – types of a spreadsheet, components of a worksheet, ● Starting LibreOffice Calc ● Creating a worksheet	● Group activity on identifying components of spreadsheet in LibreOffice Calc	02
2. Perform basic operations in a spreadsheet	● Opening workbook and entering data – types of data, steps to enter data, editing and deleting data in a cell ● Selecting multiple cells ● Saving the spreadsheet in various formats ● Closing the spreadsheet ● Opening the spreadsheet. ● Printing the spreadsheet.	● Group activity on working with data on LibreOffice Calc	03
3. Demonstrate the knowledge of working with data and formatting text	● Using a spreadsheet for addition – adding value directly, adding by using cell address, using a mouse to select values in a formula, using sum function, copying and moving formula ● Need to format cell and content ● Changing text style and font size ● Align text in a cell ● Highlight text	● Group activity on formatting a spreadsheet in LibreOffice Calc ● Group activity on performing basic calculations in LibreOffice Calc.	02
4. Demonstrate the knowledge of using advanced features in spreadsheet	● Sorting data, ● Filtering data, ● Protecting spreadsheet with password	● Group activity on sorting data in LibreOffice Calc	03
5. Make use of the software used for making slide presentations	● Available presentation software ● Steps to start LibreOffice Impress	● Group practice on working with LibreOffice Impress tools,	02

	● Adding text to a presentation	● Group practice on creating a presentation in LibreOffice Impress	
6. Demonstrate the knowledge to open, close and save slide presentations	● Open, Close, Save and Print a slide presentation	● Group activity on saving, closing and opening a presentation in LibreOffice Impress	01
7. Demonstrate the operations related to slides and texts in the presentation	● Working with slides and text in a presentation- adding slides to a presentation, deleting slides, adding and formatting text, highlighting text, aligning text, changing text colour	● Group practice on working with font styles and types in LibreOffice Impress	04
8. Demonstrate the use of advanced features in a presentation	● Advanced features used in a presentation, ● Inserting shapes in the presentation, ● Inserting clipart and images in a presentation, ● Changing slide layout	● Group activity on changing slide layout on LibreOffice Impress	03

Part B: Vocational Skills

Unit 1: Repair and Maintenance of Mixer/ Grinder

Learning Outcome	Theory (15 Hours)	Practical (25 Hours)	Duration (40 Hrs)
1. Assemble, dismantle and operate Mixer/ Grinder	● Models and makes of Mixer/ Grinder, ● Features of Mixer/ Grinder, ● Types of mixers – stand mixer, hand mixer, spiral mixer, dough mixer ● Auto Overload Protector (OLP) ● Parts of Mixer/ Grinder, ● Functioning of various parts of the Mixer/ Grinder, ● Safety measures for operating Mixer/ Grinder, ● Assembly of Mixer/ Grinder, ● Disassembly of Mixer/ Grinder	● Identify and name the types, make and model of Mixer/ Grinder, ● Identify and list the features of Mixer/ Grinder, ● Identify and name the parts of Mixer/ Grinder, ● Group activity to operate the Mixer/ Grinder and observe the functioning of each part, ● Demonstrate the operation of overload protector button in the Mixer/ Grinder, ● Group activity to dismantle and assemble the Mixer/ Grinder	20
2. Replace dysfunctional part of Mixer/ Grinder	● Cleaning the Mixer/ Grinder parts – jars, base unit, blades, ● Preventive Maintenance of Mixer/ Grinder, ● Servicing and repairing different parts of Mixer/ Grinder,	● Demonstrate the cleaning and servicing of parts of Mixer/ Grinder, ● Draw a chart showing the faults and their solutions in Mixer/ Grinder, ● Demonstrate to repair the Mixer/ Grinder,	20

	● Frequently occurring faults in Mixer/ Grinder and their solutions, ● Repairing the Mixer/ Grinder, ● Replacing dysfunctional part of the Mixer/ Grinder, ● Functionality after repairing/ replacement of dysfunctional part of Mixer/ Grinder.	● Demonstrate to replace the dysfunctional part of the Mixer/ Grinder, ● Demonstrate to test the functioning of Mixer/ Grinder after repairing/replacement of dysfunctional part.	
Unit 2: Repair and Maintenance of Juicer			
Learning Outcome	Theory (15 Hours)	Practical (25 Hours)	Duration (40 Hrs)
1. Assemble, dismantle and operate Mixer/ Grinder	● Models and makes of Juicer, ● Features of Juicer, ● Types of Juicer, ● Parts of Juicer, ● Functioning of various parts of the Juicer, ● Safety measures for operating Juicer, ● Assembly of Juicer, ● Disassembly of Juicer.	● Identify and name the types, make and model of Juicer, ● Identify and list the features of Juicer, ● Identify and name the parts of Juicer, ● Group activity to operate the Juicer and observe the functioning of each part, ● Demonstrate the operation of Juicer, ● Group activity to dismantle the Juicer, ● Group activity to assemble the Juicer.	20
2. Replace dysfunctional part of Mixer/ Grinder	● Cleaning the parts of Juicer, ● Preventive Maintenance of Juicer , ● Servicing and repairing different parts of Juicer, ● Frequently occurring faults in Juicer and their solutions, ● Repairing the Juicer, ● Replacing dysfunctional part of the Juicer. ● Functionality after repairing/replacement of dysfunctional part of Juicer,	● Demonstrate the cleaning and servicing of parts of Juicer, ● Draw a chart showing the faults and their solutions in Juicer, ● Demonstrate to repair the Juicer, ● Demonstrate to replace the dysfunctional part of the Juicer, ● Demonstrate to test the functioning of Juicer after repairing/replacement of dysfunctional part.	20

DETAIL SYLLABUS**CLASS - XII****SEMESTER – IV**

Part A: Employability Skills			
Unit 4: Entrepreneurial Skills – IV			
Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	Duration (20 Hrs)
1. Describe the concept of entrepreneurship and the types and roles and functions of entrepreneur	● Entrepreneurship and entrepreneur ● Characteristics of entrepreneurship ● Entrepreneurship-art and science ● Qualities of a successful entrepreneur ● Types of entrepreneurs ● Roles and functions of an entrepreneur ● What motivates an entrepreneur ● Identifying opportunities and risk-taking ● Startups	● Group discussion on the topic “An entrepreneur is not born but created”. ● Conducting a classroom quiz on various aspects of entrepreneurship. ● Chart preparation on types of entrepreneurs ● Brainstorming activity on What motivates an entrepreneur	08
2. Identify the barriers to entrepreneurship	● Barriers to entrepreneurship, ● Environmental barriers, ● No or faulty business plan, ● Personal barriers	● Group discussion about “What we fear about entrepreneurship” ● Activity on taking an interview of an entrepreneur.	04
3. Identify the attitude that make entrepreneur successful	● Entrepreneurial attitude	● Group activity on identifying entrepreneurial attitude.	04
4. Demonstrate the knowledge of entrepreneurial attitude and competencies	● Entrepreneurial competencies ● Decisiveness, ● Initiative ● Interpersonal skills- positive attitude, stress management ● Perseverance ● Organisational skills- time management, goal setting, efficiency, managing quality.	● Playing games, such as “Who am I”. ● Brainstorming a business ideas ● Group practice on “Best out of Waste” ● Group discussion on the topic of “Let’s grow together” ● Group activity on listing stress and methods to deal with it like Yoga, deep breathing exercise.	04
Unit 5: Green Skills – IV			
Learning Outcome	Theory (05 Hours)	Practical (10 Hours)	Duration (15 Hrs)
1. Identify the benefits of the green jobs	● Green jobs ● Benefits of green jobs	● Group discussion on the importance of green job,	08

	● Green jobs in different sectors: ● Agriculture ● Transportation ● Water conservation ● Solar and wind energy ● Eco-tourism ● Building and construction ● Solid waste management ● Appropriate technology	● Chart preparation on green jobs in different sectors.	
2. State the importance of green jobs	● Importance of green jobs in ● Limiting greenhouse gas emissions, ● Minimizing waste and pollution, ● Protecting and restoring ecosystems, ● Adapting to the effects of climate change	● Preparing posters on green jobs, ● Group activity on tree plantation. ● Brainstorming different ways of minimizing waste and pollution	07

Part B: Vocational Skills

Unit 3: Repair and Maintenance of Microwave Oven

Learning Outcome	Theory (15 Hours)	Practical (25 Hours)	Duration (40 Hrs)
1. Operate Microwave Oven	● Models and makes of Microwave oven, ● Features of Microwave oven, ● Microwave as source of energy, ● Microwave oven composition, ● Types of Microwave Oven, ● Parts of Microwave Oven, ● Working of Microwave Oven ● Advantages and Disadvantages of Microwave Oven, ● Safety Measures before Using Microwave Oven, ● Safety Measure for Cooking in Microwave Oven, ● General guidelines for using Microwave Oven	● Identify and name the types, make and model of Microwave Oven, ● Identify and list the features of Microwave Oven, ● Identify and name the parts of Microwave Oven, ● Group activity to operate the Microwave Oven and observe its functioning, ● List the advantages and disadvantages of Microwave Oven, ● List the Safety Measures before Using Microwave Oven, ● Demonstrate the Safety Measure for Cooking in Microwave Oven.	20
2. Repair and Replace	● Malfunctioning of Microwave Oven, ● User manual,	● Group activity to dismantle the Microwave Oven,	20

dysfunctional part of Microwave Oven	● Assembly of Microwave Oven, ● Disassembly of Microwave Oven, ● Preventive Maintenance of Microwave Oven, ● Cleaning and Maintenance Procedure, ● Documentation ● Servicing and repairing different parts of Microwave Oven, ● Frequently occurring problems and their causes, ● Faults, Symptoms and Solution of dysfunctional Microwave Oven, ● Case study of various types of faults and their solution of dysfunctional Microwave Oven, ● Repairing/Replacing of dysfunctional Module in Microwave Oven.	● Group activity to assemble the Microwave Oven, ● Demonstrate the cleaning and servicing of parts of Microwave Oven, ● Draw a chart showing the faults and their solutions in Microwave Oven, ● Demonstrate to repair the Microwave Oven, ● Demonstrate to replace the dysfunctional part of the Microwave Oven, ● Demonstrate to test the functioning of Microwave Oven after repairing or replacement of dysfunctional part.	
Unit 4: Workplace Health and Safety Practices			
Learning Outcome	Theory (15 Hours)	Practical (15 Hours)	Duration (30 Hrs)
1. Deal with workplace hazards	● Workplace hazards, risks and accidents, ● Various warning and safety signs. ● Location and people dealing with health and safety in the workplace, ● Different ways of preventing accidents at the workplace.	● Identify and list the workplace hazards, risks and accidents, ● Identify and location and people dealing with health and safety in the workplace, ● Identify the various warning signs at the workplace, ● List the different ways of preventing accidents at the workplace.	08
2. Apply fire safety practices	● Organizational safety procedures for maintaining electrical safety, handling tools and hazardous materials, ● Warning signs while accessing sensitive work areas, ● importance of good housekeeping, ● Importance of maintaining appropriate postures while lifting heavy objects.	● List the types of fire and fire extinguishers, ● Prepare a report to inform the relevant authorities about any abnormal situation/behaviour of any equipment/system, ● Demonstrate to use a fire extinguisher in case of a fire incident, ● Demonstrate to lift heavy objects.	07
3. Follow emergencies, rescue and first-aid procedures	● First aid procedures ● Electrocution safely, ● Cardiopulmonary Resuscitation (CPR),	● Demonstrate to apply first aid in case of a minor accident,	08

	● Defined emergency procedures such as raising alarm, safe/efficient, evacuation, moving injured people,	● Demonstrate the steps to free a person from electrocution safely, ● Administer Cardiopulmonary Resuscitation (CPR), ● Demonstrate the application of emergency procedures.	
4. Effective waste management/ recycling practices	● Concept of waste management and methods of disposing hazardous waste, ● Process of disposal of hazardous waste, ● Electronic waste disposal procedures.	● List the hazardous waste materials, ● Demonstrate the procedures of disposal of hazardous waste, ● Demonstrate the procedures for disposal of Electronic waste.	07

ORGANISATION OF FIELD VISITS and OJT

In a year, at least 3 field visits/educational tours and On-the-Job-Training (OJT) in vacation should be organised for the students to expose them to the activities in the workplace. Visit a service centre of home appliances and observe the following: Location, Site, home appliances, their installation, repair and maintenance. Students should achieve the following outcomes.

1. Explain the use of appropriate tools, parts, relevant reference sheets, manuals and documents.
2. Disposing the packaging material waste as per the company's norms.
3. Perform basic inspection of the feed water valve, tank valve, tubing, housing etc. to diagnose reasons for low/no water production
4. Identify reasons for leaks in the filter housing due to loose housing, damaged or misaligned Oring, cracks in the housing
5. Detect worn-out auto shut off valve through symptoms such as loud vibrating noise, drain water never shutting off etc.
6. Detect other problems such as clogged filters, storage tank problems, clogged flow resistor, inadequate/excessive water pressure, improper saddle valve mounting etc
7. Detect basic electrical faults such as improper/no earth, defective power cord, connector or internal wiring defect, short/ loose/open contacts, blown fuse
8. Inspect each module of the unit separately if the fault is not identified through basic tests.
9. Communicate effectively at the workplace.
10. Apply health and safety practices at the workplace.