

### Syllabus for Rural water supply Plumber & Sanitary work Assistant, V2

<b>Course Name</b>	<b>Rural water supply Plumber &amp; Sanitary work Assistant, V2</b>
<b>Sector</b>	Plumbing
<b>Course Code</b>	STC-PLM/2021/3001, V2
<b>Level</b>	<b>3</b>
<b>Occupation</b>	Rural water supply Plumber & Sanitary work Assistant
<b>Job Description</b>	Fittings and fixing of various water supply and sanitary work components of any private, public building/house under the supervision of the Sr. plumber/Supervisor (plumber).
<b>Course Duration</b>	<b>Total Duration 390 Hrs (T-90, P-180, OJT-60 and ES-60)</b>
<b>Trainees' Entry Qualification</b>	Class 8 pass and pursuing continuous regular schooling, OR Class 8 Pass with 1 year experience, OR Class 10 Pass OR Previous relevant qualification of NSQF Level 2 with 1 yr experience
<b>Trainers Qualification</b>	In Rural water supply Plumber & Sanitary work Assistant, BE/BTECH in Civil Engineering with 1 year experience OR Diploma in Civil Engineering with 2 years experience OR ITI in Relevant trade with 5 years experience.

#### Structure of Course:

<b>Module No.</b>	<b>Outcome</b>	<b>Theory (Hrs)</b>	<b>Practical (Hrs)</b>	<b>Total (Hrs) [Multiple of 30]</b>
1	Apply Safe Working Practices	10	20	30
2	Explain plumbing system components	10	20	30
3	Interpret diagrams and drawings used for plumbing work	10	20	30
4	Identify different tools for Plumbing	10	20	30
5	Identify different Plumbing Material and Pipes	10	20	30
6	Identify measurements and Symbols used in Plumbing	10	20	30
7	Make Capable to use pipe fittings, joints, bends, different pipe joining tools for distribution of water supply	10	20	30
8	Identify different items and in house drainage, sanitary installation	10	20	30
9	Troubleshoot problems in plumbing system	10	20	30
10	Work in real job situation with special emphasis on basic safety and hazards in this domain.	0	60	60
11	Employability Skills- 60 hrs.	60		60
	<b>TOTAL:</b>	<b>150</b>	<b>240</b>	<b>390</b>

## SYLLABUS

### Module No 1: Apply Safe Working Practices

**Outcome:** Apply Safe Working Practices

**Theory content:**

- Use the appropriate tools required for the specific work or job
- Ensure that the necessary protective equipment are available
- Do not apply excessive pressure or force
- Use or wear safety gear (helmet, gloves, goggles, safety shoes, ear plugs, etc.)

**Practical content:**

- Demonstrate Knowledge of Safe working practices on construction sites
- Carry out safe working practices on construction sites
- Identify hazards and procedure to avoid accidents at work sites
- Taking undue risk during execution of a job at a construction site should be avoided
- In any construction site where work is in progress, put up notice for outsiders to avoid the area until the work is completed

**Tools & Equipment needed:** First Aid box, Different types of fire extinguishers, PPE kits, Safety charts

### Module No 2: Explain plumbing system components

**Outcome:** Explain plumbing system components

**Theory content:**

- Introduction-plumbing and sanitary system, A plumber's job role
- Components of plumbing system
- Standard plumbing and sanitary material, as per the Bureau of Indian Standards (BIS)

**Practical content:**

- Identify the plumbing items fitted in school and house
- Identify the material used in plumbing fittings and fixtures
- Make a list of the identified plumbing items

**Tools & Equipment needed:** Rule Steel, Rule Wooden 4 fold, Hacksaw Frame adjustable, Scriber, Surface plate, Marking Table, Combination set, Hand Vice, Jaw, etc.

### Module No 3: Interpret diagrams and drawings used for plumbing work

**Outcome:** Interpret diagrams and drawings used for plumbing work

**Theory content**

- Describe the convention used in drawings of Mechanical components and building structures etc.
- Identify mechanical components and their specification from drawing
- Identify the stages of construction at which the installation of pipe line

**Practical content:**

- Concept of plan, elevation, side view and sectional view of civil engineering structure
- Draw free hand mechanical sketches of the components
- Identify fabrication items

**Tools & Equipment needed:** Hacksaw Frame adjustable, Centre punch, Hammer ball peen, Surface plate, Marking Table, 'V' Blocks with clamps, etc

**Module No 4: Identify different tools for Plumbing**

**Outcome:** Identify different tools for Plumbing

**Theory content:**

- The major tools used in plumbing-
  1. Holding tools
  2. Fitting tools
  3. Cutting tools
  4. Pipe bending tools

**Practical content:**

- Collect the plumbing tools available in your classroom
- Draw figures of the plumbing tools and label them
- Collect the masonry tools available in your classroom
- Draw figures of the masonry tools and label them

**Tools & Equipment needed:**

Hacksaw Frame adjustable, Scriber, Centre punch, Chisel Cold, flat, Level spirit wooden, Plumb bob, Trowel, Stillson wrench, Screw Driver, Cutting pliers, Snip bend, etc.

**Module No 5: Identify different Plumbing Material and Pipes**

**Outcome:** Identify different Plumbing Material and Pipes

**Theory content:**

- Sealing Material:
  - Thread Seal Tape, Plumber's Putty, Sealing Adhesives
- Plumbing Pipes-

Types of plumbing pipes-advantages, Precautions

1. Cast Iron (CI) pipes, 2. Ductile iron pipes, 3. Steel pipes, 4. Galvanized Iron (GI) pipes, 5. Copper pipes
6. Asbestos Cement (AC) pipes, 7. Concrete pipes
8. Stone ware pipes, 9. PVC pipes

**Practical content:**

- Collect the plumbing material from a shop
- Identify the purpose of this material
- Identify the plumbing pipes in a shop

**Tools & Equipment needed:**

Hacksaw Frame adjustable, Scriber, Centre punch, Chisel Cold, flat, Level spirit wooden, Plumb bob, Trowel, Stillson wrench, Screw Driver, Cutting pliers, Snip bend, Wooden Mallet small, Surface plate, Marking Table, 'V' Blocks with clamps, Pipe bender(Hydraulic type), Hammering drilling machine, Pipe bender, manually operated, Chain :pipe wrench, Stillson pattern pipe wrenches, Pipe vice, etc.

**Module No 6: Identify measurements and Symbols used in Plumbing**

**Outcome:** Identify measurements and Symbols used in Plumbing

**Theory Content:**

- Introduce Measurement of Length, Measurement of Weight, Length Conversion, Measurement of Volume, Measurement of Density, Measurement of Pressure, Comprehensive Conversion
- Identify different types of measurement tools
- Identify different types of plumbing symbols and their uses

**Practical Content:**

- Measure the length, width and height of a room
- Measure the weight of a brick and cement bag
- Draw the plumbing symbols

**Tools & Equipment needed:**

Hacksaw Frame adjustable, Hammer ball peen, File flat rough, Surface plate, Marking Table, Scribing Block, Universal, Combination set, etc.

**Module No 7: Make capable to use pipe fittings, joints, bends, and different pipe joining tools for distribution of water supply**

**Outcome:** Make capable to use pipe fittings, joints, bends, and different pipe joining tools for distribution of water supply

**Theory Content:**

- Introduce Pipe Fittings
- Identify the type of Pipe Fittings
- Install and maintain different Electric pumps

**Practical Content:**

- Identify the fitting items available in the market
- Draw figures of the various types of bends
- Identify the components
- Join the pipe with the help of proper pipe joining tools
- Draw the figure of the joints

**Tools & Equipment needed:**

Hacksaw Frame adjustable, Scriber, Centre punch, Chisel Cold, flat, Level spirit wooden, Plumb bob, Trowel, Stillson wrench, Screw Driver, Cutting pliers, Snip bend, Wooden Mallet small, Surface plate, Marking Table, 'V' Blocks with clamps, Pipe bender(Hydraulic type), Hammering drilling machine, Pipe bender, manually operated, Chain :pipe wrench, Stillson pattern pipe wrenches, Pipe vice, Electric PPR pipe welding machine, Metal rack, etc.

**Module No 8: Identify different items and in house drainage, sanitary installation**

**Outcome:** Identify different items and in house drainage, sanitary installation

**Theory Content:**

- Install and conveniences of House drainage, and domestic sanitary
- Make capable house sewer connection

**Practical Content:**

- Identify the drainage, sanitary installations and conveniences items fitted in the school and house
- Identify the material used in sanitary fittings, plumbing fittings and fixtures
- Identify the sanitary items available in the market
- Draw figures of the various types of sanitary items

**Tools & Equipment needed:**

Hacksaw Frame adjustable, Scriber, Centre punch, Chisel Cold, flat, Level spirit wooden, Plumb bob, Trowel, Stillson wrench, Screw Driver, Cutting pliers, Snip bend, Wooden Mallet small, Surface plate, Marking Table, 'V' Blocks with clamps, Pipe bender(Hydraulic type), Hammering drilling machine, Pipe bender, manually operated, Chain :pipe wrench, Stillson pattern pipe wrenches, Pipe vice, Electric PPR pipe welding machine, Metal rack, etc.

**Module No 9: Troubleshoot problems in plumbing system**

**Outcome:** Troubleshoot problems in plumbing system

**Theory Content:**

- Significance of the good customer and good service to an organization
- Methods of rectification and modification and costing should be done and communicated

**Practical Content:**

- Identify causes for and damage in plumbing system
- Refurbishing and maintaining water supply systems, sanitary fittings, and conducting tests to ensure proper functionality

**Tools & Equipment needed:**

Water meter, working bench, Chain :pipe wrench, Stillson pattern pipe wrenches, Pipe stock and dies complete with stocks, bushing, bushing holders, Taps and wrenches sizes covered, to suit pipes, Scribing gauge, Blow lamp, Washer cutter, etc.

**Module No.- 10: OJT**

**Outcome:** Work in real job situation with special emphasis on basic safety and hazards in this domain

**Practical Content:**

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for **60 Hours.**)

**Module No - 8: Employability Skills (60 Hrs)**

### Employability Skills (60 hours) Model Curriculum

**Module Summary:**

S. No	Module Name	Duration (hours)	Assessment Marks
1.	Introduction to Employability Skills	1.5	2
2.	Constitutional values - Citizenship	1.5	2
3.	Becoming a Professional in the 21st Century	2.5	6
4.	Basic English Skills	10	6
5.	Career Development & Goal Setting	2	3
6.	Communication Skills	5	4
7.	Diversity & Inclusion	2.5	2
8.	Financial and Legal Literacy	5	5
9.	Essential Digital Skills	10	8
10.	Entrepreneurship	7	4
11.	Customer Service	5	3
12.	Getting Ready for Apprenticeship & Jobs	8	5
	<b>Total</b>	<b>60</b>	<b>50</b>

**Key Learning Outcomes****Introduction to Employability Skills Duration: 1.5 Hours**

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

**Constitutional values - Citizenship Duration: 1.5 Hours**

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

**Becoming a Professional in the 21st Century Duration: 2.5 Hours**

5. Discuss importance of relevant 21st century skills.

6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

#### **Basic English Skills Duration: 10 Hours**

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

#### **Career Development & Goal Setting Duration: 2 Hours**

11. Create a career development plan with well-defined short- and long-term goals

#### **Communication Skills Duration: 5 Hours**

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

#### **Diversity & Inclusion Duration: 2.5 Hours**

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

#### **Financial and Legal Literacy Duration:5 Hours**

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

#### **Essential Digital Skills Duration: 10 Hours**

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

#### **Entrepreneurship Duration: 7 Hours**

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

#### **Customer Service Duration: 5 Hours**

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

#### **Getting Ready for apprenticeship & Jobs Duration: 8 Hours**

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

**Learning Outcome–Assessment Criteria**

<b>Outcomes to be assessed/ NOS to be assessed</b>	<b>Assessment criteria for the outcome</b>
<b>1. Maintain safety at the work site.</b>	<b>After completion of this module students will be able to</b> 1.1 Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	1.2 Identify and take necessary precautions on fire and safety .
	1.3 Identify, handle and store / dispose dangerous goods and substances according to safety regulations and requirements.
	1.4 Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly. according to site accident/injury procedures.
	1.5 Identify and observe site evacuation procedures according to site policy.
	1.6 Identify Personal Productive Equipment (PPE) and use the same as per related working environment.
	1.7 Identify basic first aid and use them under different circumstances.
	1.8 Identify different fire extinguisher and use the same as per requirement.
<b>2. Understand plumbing system components.</b>	<b>After completion of this module students will be able to</b> 2.1 Explain the role of plumber and its importance-Plumbing cycle- plumbing and sanitary system
	2.2 Explain- What is Plumbing? What is Sanitary Work?
	2.3. Explain Components of plumbing system.
	2.4 Name Standard plumbing and sanitary material, as per the Bureau of Indian Standards (BIS).
	2.5 Perform maintenance of all the instruments and tools related to plumbing.
	2.6 Explain Points to be consider before starting the work by a plumber
<b>3. Interpret diagrams and drawings used for plumbing work.</b>	<b>After completion of this module students will be able to</b> 3.1 Demonstrate the Concept of plan, elevation, side view and sectional view of civil engineering structure
	3.2 Draw free hand mechanical sketches of the major tools used in plumbing
	3.3 Identify water supply and Sanitary fitting used in installation
	3.4 Describe building materials and their property may effect during installation of pipe lines, fittings etc.
	3.5 Identify the type of pipes and their material.
	3.6 Develop free hand sketches i. Draw a simple bathroom installation. ii. Draw a waste water outlet from the Bathroom.



<b>4. Identify different tools for Plumbing</b>	<b>After completion of this module students will be able to</b> 4.1 Describe the major tools used in plumbing-
	4.2 Identify different types of holding tools and use the same as per requirement.
	4.3 Identify different types of fitting tools and use the same as per requirement.
	4.4 Identify different types of Cutting tools and use the same as per requirement.
	4.5 Identify different types of Pipe bending tools and use the same as per requirement.
	4.6 Identify different types of other accessories besides mentioned above and use the same as per requirement.
<b>5. Know different Plumbing Material and Pipes.</b>	<b>After completion of this module students will be able to</b> 5.1 Prepare list of different Sealing materials and location where they are used in plumbing.
	5.2 Identify different types of pipes used in water supply and sanitary and drainage work and their advantages, disadvantage and Care during work.
<b>6. Identify measurements and Symbols used in Plumbing</b>	<b>After completion of this module students will be able to</b> 6.1 Identify different types of Measuring tools for length, diameter, water pressure
	6.2 Identify different types of Plumbing Symbols-, Importance of plumbing symbols, Identification of the symbols given in the drawings of fixtures
<b>7. Able to use pipe fittings, joints, bends, different pipe joining tools for distribution of water supply.</b>	<b>After completion of this module students will be able to</b> 7.1 Identify the fittings available in the workshop.
	7.2 Prepare a list of the identified fitting items seen in the workshop.
	7.3 Draw figures of the various types of bends.
	7.4 Collect the pipe joints, pipes and tools and join the pipe with the help of proper pipe joining tools.
	7.5 Draw the figure of the threaded joints, grooved and compression joints.
<b>8. Identify different items and in house drainage, sanitary installation.</b>	<b>After completion of this module students will be able to</b> 8.1 Identify the drainage, sanitary installations and conveniences items fitted in the school.
	8.2. Make a list of the identified sanitary items.
	8.3 Identify the sanitary fittings and fixtures and types material used.
	8.4. Draw figures of the various types of sanitary items.
<b>9. Trouble shoot problems in plumbing system.</b>	<b>After completion of this module students will be able to</b> 9.1 Identify causes for and damage in plumbing system
	9.2 Reconditioning of water supply and sanitary fittings. Cleaning of sanitary fittings leakage and repairs. Testing for correct functioning.
<b>10.OJT</b>	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor

	for 60 Hours.)
<b>11. Employability Skill</b>	As per guided curriculum

**List of Tools, Equipment & materials needed for a batch of 30 Trainees:**

SI No	Items with description	Unit of expression	Qty
1	Embroidery Thread of Various composition , Count And Ply (assortment)	packs/reels	30nos
2	Novelty, Fancy Yarns, Metallic yarns (assortment)	packs/reels	20nos
3	Base-Fabric yardage for embroidery	mtrs	100nos
4	Surface Embellishments and stickers tickets (assortment, as per req)	packs	10nos
5	Masking Tape		10nos
6	Needles for embroidery (various sizes)	packs	10nos
7	Thimbles (for each finger tips)		30nos
8	Design templates		1 no
9	Scales 24"		3nos
10	Measuring Tape		15nos
11	Punch Needles	packs	5nos
12	Scissors for Fabric Cutting And Paper Cutting		5nos
13	Frame for embroidery	sets	30nos
14	Tracing Paper(Size- A3)	packs	2nos
15	Carbon Paper (Coloring)	packs	2nos
16	Cotton-Swabs/Dabber/roll	rolls	1 no
17	Hand Held Thread Trimmer		30nos
18	Seam Ripper		30nos
19	Fire Extinguisher		1 no
20	Glue	pack	1 no
21	Bent Neck needle/aari needle		5nos
22	Basic Stationary	sets	30nos
23	Pick Glass		3nos
24	Students Manual		30nos
25	First Aid Box		1 no
26	Tracing Wheel		5nos
27	Tailor's Chalk	Box	1 no
28	Pins & Safety Pins & Dress Maker's Pins	Box	1 no
29	Pin Cushion	Box	1 no
30	Backing Paper/fusing	packs	2nos
31	Hand Embroidery Motif Books		1 no
32	Student's Chair With Table Arm		30nos
33	Teacher's Table		1 no
34	Teacher's Chair		1 no
35	White/Black Board		1 no
36	White Board Marker/Chalk		1 no
37	Board Eraser		1 no
38	Cupboard		1 no
39	Dress Form (size medium, preferably woman)		1 no
40	Hanger		5
41	Dustbin		1 no
42	Carpet (depends on covered floor area)		1 no

SI No	Items with description	Unit of expression	Qty
43	* If carpet not there then stools and big table		15
44	Ink or tracing material	bottles	2nos
45	Samples , Garments, Made Ups And Home Furnishing and embroidery swatches		1 no
46	Iron and Iron Table		1 no
47	Drawing sheets		60nos
48	Sketching equipment of different medium	set	15nos
49	Drawing boards		30nos
50	Interchangeable Needle Set	set	10nos
51	Straight needle	set	20nos
52	Tapestry Needle		30nos
53	Stitch Markers		30nos
54	Blocking Pins		60nos
55	Ruler 12"		15nos
56	Thread Cutter		30nos
57	Knitting Yarns (Wool / Acrylic / Cotton )	Box	30nos

### Marks distribution

Sr No	Outcome No.	Outcome Name	Total marks Th	Total marks Pr
1	PLM/3001/OC1	Apply Safe Working Practices	20	80
2	PLM/3001/OC2	Explain plumbing system components	20	90
3	PLM/3001/OC3	Interpret diagrams and drawings used for plumbing work	20	90
4	PLM/3001/OC4	Identify different tools for Plumbing	20	90
5	PLM/3001/OC5	Identify different Plumbing Material and Pipes	10	50
6	PLM/3001/OC6	Identify measurements and Symbols used in Plumbing	10	50
7	PLM/3001/OC7	Make Capable to use pipe fittings, joints, bends, different pipe joining tools for distribution of water supply	20	80
8	PLM/3001/OC8	Identify different items and in house drainage, sanitary installation	20	70
9	PLM/3001/OC9	Troubleshoot problems in plumbing system	10	50

10	PLM/3001/OC10	Work in real job situation with special emphasis on basic safety and hazards in this domain.	0	150
11	DGT/VSQ/N0102	Employability Skills- 60 hrs.	50	0