

Syllabus For Roller Screen Printing Machine operator

Course Name	Roller Screen Printing Machine operator
Sector	TEXTILES & HANDLOOMS
Course Code	TXT/2024/RSMO/389
Sub-sector	Processing
Level	3
Occupation	Roller Screen Printing Machine operator
Job Description	The operator will perform fabric printing operations in the printing machine, after preparation of design & print paste. The operator will be also responsible for machine cleaning, maintenance activities and maintaining health & safety at work place.
Course Duration	Total Duration 360 Hrs (T- 90, P- 150, OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 10 OR Grade 8 with two year of (NTC/ NAC) after 8 th OR Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 8th grade pass with 2 yrs relevant experience OR Previous relevant Qualification of NSQF Level 2 with one year experience OR Previous relevant Qualification of NSQF Level 2.5 with 6 months experience
Trainers Qualification	B. Tech/B.E. in Textile Technology/ Textile Engineering from AICTE/UGC recognized Engineering College/ university with one-year experience in the relevant field. OR 03 years Diploma in Textile Technology/ Textile Engineering/Handloom & Textile from AICTE recognized board of technical education with two years experience in the relevant field.

Structure of Course:

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	OJT (Hrs.)	Total (Hrs)
1	Introduction to Textile printing	Familiarize with operation and control of Textile roller screen printing machine	10	20		30
2	Operating the Printing machine	Demonstrate of step-by-step operating procedure of Printing machine executing correct process sequence	20	40		60
3	Fabric quality & machine maintenance	Conduct quality control procedures in fabric printing, addressing process damages or defects	40	50		90

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	OJT (Hrs.)	Total (Hrs)
4	Occupational safety	Apply safe working practices at work place.	10	20		30
5	Workplace communication strategies	Demonstrate a comprehensive effective workplace communication strategy.	10	20		30
6	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	-	-	60	60
7	Employability Skills	As per guided curriculum	60	-		60
TOTAL			150	150	60	360

SYLLABUS:**Module No. 1: Introduction to Textile printing**

Outcome: Familiarize with operation and control of Textile roller screen printing machine.

Theory Content:

- Definition & objectives of Printing.
- Difference between dyeing & printing.
- Details of printing process.
- Brief on various styles and methods of printing.
- Definition of fabric printing terms such as **Direct printing, Discharge printing, Resist printing, Absorbency, Binder, Bleeding, Pigment, Thickener, Roller, Steaming, Screen** etc.
- Different processes involved in Printing machine.
- Various Types of Printing machine.
- Roles and responsibility of the Printing Machine Operator.
- Step wise process flow of Printing machine.

Practical Content:

- Identify different type of Printing machine based on its application.
- Demonstrate Printing operation.
- Drawing of the schematic diagram of fabric flow inside Printing machine.
- Execute different functions of control systems of the machine.
- Demonstrate of Controlling and monitoring systems of the Printing machine.
- Make sure the required dyes & chemicals are prepared.
- Demonstrate loading & unloading of machine.
- Practice in maintaining shift logbook and preparation of report.
- Become familiar in faults identification.
- Preparation of shift handover/takeover process.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook, Pen pencil.

Tools & Equipment needed: Roller screen Printing Machine, Apron, head cap, mask, shoe, Fabric rolls,

Fabric trolley, Work method posters, pictures, videos. Temperature sensor, width measuring device, pen, pencil, marker etc.

Module No. 2: Operating the Printing machine

Outcome: Demonstrate of step-by-step operating procedure of Printing machine executing correct process sequence

Theory Content:

- Objectives of Printing process.
- Description of different components of a Printing machine.
- Functions of the parts of Printing machine
- Principles of fabric Printing process.
- Types of fiber, yarn and fabric.
- Process flow & types of print paste used.
- Viscosity & quantity of glue to be applied for different methods of printing.
- Functioning of various control of machine.
- Process parameters effecting performance of Printing machine such as **Number of Squeegee, Temperature, Repeat Size, Paste viscosity, Film thickness, Roller pressures, Fabric Speed, Moisture, Lapping** etc.

Practical Content:

- Identify different components of a Printing machine and demonstration of their functions.
- Demonstrate functions of **Feed Device, Doctor blade, Engraved roller, Printing Bed, Lint doctor, Blankets, Conveyer, Brush Segments, Feeding Pumps, Drier, Back grey, Plating unit, Furnishers, Color box, Squeeze System** of the machine.
- Change different settings of the Printing machine and notice the effects on shades of print.
- Execute the process sequence of Printing machine namely- Preparation of print paste, loading the fabric, screen placing & gluing the blanket, adjusting squeeze pressure, checking of screen, checking printed fabric for defects.
- Demonstrate of step-by-step operating procedure of Printing machine such as - Switching on the Power, loading the screen, Main fabric stitching, set and adjust all parameters, Checking the passage of fabric, Checking the sequence of designs, Checking the colour position.
- Ensure that all safety devices are operational.
- Control the parameters of the machine during the Printing process.
- Adjust machine settings to meet the production/quality requirements.
- Instructions during shift change.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook, Pen pencil.

Tools & Equipment needed: Roller screen Printing Machine, Apron, head cap, mask, shoe, Fabric rolls, Fabric trolley, Work method posters, pictures, videos. Temperature sensor, width measuring device, pen, pencil, marker etc.

Module No. 3: Fabric quality & machine maintenance

Outcome: Conduct quality control procedures in fabric printing, addressing process damages or defects.

Theory Content:

- Effect of time, temp & other curing conditions on printed fabric.
- Different quality related terminologies of Printing process.
- Important factors of Printing, different process control parameters.
- Fabric faults after Printing and its remedies.
- Different check-points before starting of machine operation.
- Machine maintenance schedule.
- Various preventive maintenance activities of Printing Machine.
- Safety guidelines to be followed.
- Actions to be taken in emergency conditions.

Practical Content:

- Cut the sample after drying followed by fixing & washing and after that, compare the printed sample with the standard.
- Check the shade depth of fabric and if it is not matching with the standard sample, inform to supervisor.
- Demonstrate how to perform adjusting settings based on required fabric color or pattern or quality.
- Adjust the machine settings to match the required color or shade.
- Checking of various process damages/defects in the printed fabric like – Scumming, Scratches, Snapper, Lift, Streaks, Uneven Printing etc.
- Cleaning the machine on a regular basis and carrying out preventive maintenance activities.
- Check if all controls are functioning properly.
- Demonstrate the cleaning operation of the machine properly before loading, while running & after unloading the fabric.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook, Pen pencil.

Tools & Equipment needed: Roller screen Printing Machine, Apron, head cap, mask, shoe, Fabric rolls, Fabric trolley, Work method posters, pictures, videos. Temperature sensor, width measuring device, pen, pencil, marker etc.

Module No. 4: Occupational safety

Outcome : Apply safe working practices at work place

Theory Content:

- Significance of routine cleaning activities of machine maintenance
- Identifying potential hazards associated with a lack of regular cleaning on tools, machines and work areas.
- Types of cleaning agents and tools
- Introduction of Occupational safety
- Overview of relevant occupational safety regulations and standards
- The responsibility of technician in compliance with safety guidelines
- Identification of Occupational safety hazards
- Identification of common hazards in the machine
- Describe types of hazards
- Application of PPE (Personal protective equipment)
- Selection and use of PPE
- Safe work practices with electrical systems
- Applications of electrical tools
- Describe the importance of immediate response during emergencies

- Fire prevention measures and firefighting equipment's

Practical Content:

- Demonstration of cleaning techniques
- Create a check list for routine cleaning tasks and their frequency
- Demonstrate the use protective clothing/equipment for specific tasks and work conditions
- Identify PPE application and its maintenance procedure
- Demonstrate the correct use of safety glasses, gloves and hearing protection
- Simulate an emergency scenario require the use of PPE
- Identify electrical hazards (power supply and points, loose and naked cables and wires, equipment malfunctions, etc.)
- Apply electrical precautions like insulated clothing, adequate equipment insulation, use dry work area etc.
- Identify safety features and emergency stop locations
- Present proper method of rescue techniques applied during fire hazard and other accidental situation.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements:

Protective Gloves, Head Caps, Safety Goggles, Safety Boots, Mouth Masks, coats and aprons; ear plugs or muffs; eye and facial protection; head-wear; lifting assistance;

Module No. 5: Workplace communication strategies

Outcome : Demonstrate a comprehensive effective workplace communication strategy

Theory Content:

- Explain purpose or common goals of each member in a group of willing to work toward. Members feel that they played a role in determining these goals and the methods used to achieve them.
- Describe the task between each members in group, but also with its own processes and operating procedures.
- Maintain Communication is clear and direct manner.
- Interpret machine performance data and metrics
- Explain key indicators of machine health and efficiency
- Establish clear reporting procedures for machine running and performance
- Generate machine performance reports and sharing them with the team
- Discuss supervision policy as a leader who can bring the group together and build an environment in which the team can work together effectively.

Practical Content:

- Demonstrate the purpose or common goals of each member in a group of willing to work toward. Members feel that they played a role in determining these goals and the methods used to achieve them.
- Identify the task between each members in group, but also with its own processes and operating procedures. The group periodically evaluates its performance.

- Exhibit the accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required.
- Apply Communication is clear and direct manner.
- Apply good communication environmental practices in workplace.
- Simulate/role play of ethical dilemmas in the workplace
- Illustrate organizational policies and procedures

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements:

Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual, communication tools, communication manual, On-task Communication, Instant Chats , Video Conferencing, Voice Calls, Audio Recording, Discussion Forums, Instant File Sharing, External Communication

Module No. 6: 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 7 : Employability Skills (60 Hrs)

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

Module No.	Outcome	Assessment Criteria
1	Familiarize with operation and control of Textile roller screen printing machine	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1.1. Demonstrate the Principles of Printing process. 1.2. Explain different processes involved in printing machine. 1.3. Identify the role and responsibility of the Printing Machine Operator. 1.4. Execute the process flow of printing machine. 1.5. Load & unload the machine. 1.6. Demonstrate different functions of control systems of the machine. 1.7. Maintain shift log card. 1.8. Perform the shift handover/takeover process.
2	Demonstrate of step-by-step operating procedure of Printing machine executing correct process sequence	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 2.1. Identify different components of a Printing machine. 2.2. Perform fabric Printing. 2.3. Change process parameters such as Number of Squeegee, Temperature, Paste viscosity, Roller pressures, Fabric Speed etc. as per requirement. 2.4. Demonstrate functions of Feed Device, Doctor blade, Printing Bed, Lint doctor, Blankets, Conveyer, Feeding Pumps, Drier, Plating unit, Furnishers, Color box, Squeeze System etc. 2.5. Execute the process sequence of Printing machine namely- Preparation of print paste, loading the fabric, screen placing & gluing the blanket, adjusting squeeze pressure, checking of screen, checking printed fabric for defects. 2.6. Load the screen.

Module No.	Outcome	Assessment Criteria
		2.7. Stich the main fabric. 2.8. Set & adjust all parameters. 2.9. Check the passage of the fabric. 2.10. Check the sequence of designs. 2.11. Check the color position. 2.12. Adjust machine settings to meet the production/quality requirements.
3	Conduct quality control procedures in fabric printing, addressing process damages or defects	After completion of this module students will be able to: 3.1. Explain Important factors of Printing, different process control parameters. 3.2. Detect Fabric faults after Printing and execute its remedies. 3.3. Change different control point setting of Printing machine as per requirement. 3.4. Demonstrate the check-points before starting of machine operation. 3.5. Explain the machine maintenance schedule. 3.6. Cut the sample after drying followed by fixing & washing and after that, compare the printed sample with the standard. 3.7. Check the shade depth / printed pattern of fabric. 3.8. Perform adjusting settings based on required fabric process parameters. 3.9. Checking of various process damages/defects in the printed fabric. 3.10. Perform various preventive maintenance activities of Printing Machine. 3.11. Clean the machine on a regular basis. 3.12. Check if all controls are functioning properly.
4	Apply safe working practices at work place	After completion of this module students will be able to: 4.1 Demonstrate of effective cleaning techniques 4.2 Execute machine specific cleaning procedures 4.3 Create a checklist for routine cleaning tasks 4.4 Demonstrate the use of protective clothing/equipment for the specific tasks and work conditions 4.5 Describe the importance of PPE kit 4.6 Demonstrate the correct use of safety gear. 4.7 Identify electrical hazards, including power supply issues, loose cables and equipment malfunctioning 4.8 Detect health hazards (such as untreated injuries and contagious illness/ zoonotic diseases). 4.9 Maintain Fire safety and prevention of fire hazards

Module No.	Outcome	Assessment Criteria
		in workplace [fire extinguishers, fire Alarm, fire exits] 4.10 Ensure use of general health and safety equipment and materials in the workplace first aid equipment
5	Demonstrate a comprehensive effective workplace communication strategies	<p>After completion of this module students will be able to:</p> <p>5.1 Demonstrate the purpose of each team member and their involvement in determining goals</p> <p>5.2 Identify tasks between team members and their own processes</p> <p>5.3 Apply effective communication strategies in a practical context</p> <p>5.4 Exhibit enterprise ethical standards in workplace interactions</p> <p>5.5 Apply good communication environmental practices in practical workplace</p> <p>5.6 Simulate/Role play ethical dilemmas in the work place</p> <p>5.7 Illustrate familiarity with relevant industry standards and regulations.</p> <p>5.8 Explain the organizational policies and procedures</p>
6	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).
7	Employability Skill	As per guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees (Practical)

SI No	Items Name	Specification	Qty
1	Roller Screen Printing Machine		1
2	Sewing machine		1
3	Print screens		2
4	Printing paste		As required
5	Dyes, Pigments		As required
6	Auxiliary chemicals		As required
7	Stirrer		2
8	Plastic beaker		5
9	Glass reagent jars		5
10	Stainless steel bucket		2
11	Apron		30

SI No	Items Name	Specification	Qty
12	Head cap		30
13	Shoe		30
14	Hand gloves		30
15	Fabric rolls		As required
16	Fabric trolley		As required
17	Scissors		5
18	Meterage devices		5
19	Measuring scales, Inch Tape		10
20	Nose mask		30
21	Ear plug		30
22	Thermometer		2
23	Fabric markers		5
24	Pressure gauge		2
25	Fire extinguishers		2
26	Fire Alarm		2
27	First aid equipment		5

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Familiarize with operation and control of Textile roller screen printing machine	TXT/3722/OC1	20	100	0
Demonstrate of step-by-step operating procedure of Printing machine executing correct process sequence	TXT/3722/OC2	30	170	0
Conduct quality control procedures in fabric printing, addressing process damages or defects	TXT/3722/OC3	60	180	0
Apply safe working practices at work place.	TXT/3722/OC4	20	100	0
Demonstrate a comprehensive effective workplace communication strategy.	TXT/3722/OC5	20	100	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	TXT/3722/OC6	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0