

Syllabus for Soft Flow Dye Automation Operator

Course Name	Soft Flow Dye Automation Operator
Sector	TEXTILE
Course Code	TXT/2024/SDAO/292
Level	2.5
Occupation	DYEING OPERATION
Job Description	A Soft Flow Dye automation Operator is responsible for dyeing of fabric in soft flow automatic dyeing machine. For This job, the operator requires to have knowledge of process flow and material flow in a fabric processing mill. He should have knowledge about the important functions and operations of a soft flow machine.
Course Duration	Total Duration 300 Hrs (T-50, P-130, OJT-60 and ES-60)
Trainees' Entry Qualification	9th Grade pass OR 8th Grade pass and pursuing continuous schooling OR 8th Grade pass with 1-year Vocational education & Training/Skilling after Grade 8 OR 5th Grade Pass with 4 years relevant experience OR Previous relevant Qualification of NSQF Level 2.0 in relevant Sector with 6 months relevant 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/ Knitting Technology from AICTE recognized board of technical education with two years' experience in the relevant field.

Structure of Course:

Module No.	Module name	Outcome	Compulsory / Elective	Theory (Hrs)	Practical (Hrs)	Total (Hrs) [Multiple of 30]
1	Basic Understanding of the Technology and Roles & Responsibility	Describe the preparatory and dyeing process along with Identify the roles and responsibilities of Soft Flow Dyeing Machine Operator	Compulsory	10	20	30

Module No.	Module name	Outcome	Compulsory / Elective	Theory (Hrs)	Practical (Hrs)	Total (Hrs) [Multiple of 30]
2	Machine parts with their functions and Operating the machine	Identify different machine parts & demonstrate their functions , Perform preparatory activities for operating the machine and Operate the machine for specified tasks as per requirement.	Compulsory	10	20	30
3	Dyeing process of fabric and cleanliness of work area	Demonstrate the dyeing process of fabric with Soft Flow Dyeing Machine and maintenance of Soft Flow Dyeing Machine ensuring optimal machine performance, product quality and a safe working environment	Compulsory	10	50	60
4	Maintain occupational safety hazards at work place	Apply safe working practices at work place	Compulsory	10	20	30
5	Workplace communication strategies	Demonstrate a comprehensive effective workplace communication strategies	Compulsory	10	20	30
6	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Compulsory	--	60	60
7	Employability Skill	As per guided curriculum	Compulsory	60	--	60
TOTAL				110	190	300

SYLLABUS:**Module No. 1: Basic Understanding of the Technology and Roles & Responsibility**

Outcome : Describe the preparatory and dyeing process along with Identify the roles and responsibilities of Soft Flow Dyeing Machine Operator

Theory Content:

- Basic knowledge about textile wet processing techniques.
- Requirement of dyeing operation.
- Introduction to various wet processing terms such as ABSORBENCY , DIMENSIONAL STABILITY , PIGMENT , WET EXPRESSION , SHADE PERCENTAGE, EXHAUST PERCENTAGE, DYE UPTAKE, LUSTER, MIGRATION etc.

- Brief about Batch dyeing process
- Principles of batch dyeing technique.
- Different processes involved in soft flow machine.
- Various Types of Soft Flow Dyeing Machine.
- Identify the role and responsibility of the dyeing machine operator.
- Step wise process flow of Soft Flow Dyeing Machine.

Practical Content:

- Identify various type of dyeing machine based on its application in different wet processing sector.
- Demonstration of dyeing operation of soft flow dyeing machine.
- Drawing of the schematic diagram of material flow inside soft flow dyeing machine.
- Demonstrate the loading and unloading of dyeing machine.
- Demonstration of different functions of main panel.
- Controlling and monitoring programmed electronic equipment for dyeing.
- Practice in maintaining shift logbook and preparation of report.
- Preparation of shift handover/takeover process.
- Prepare the Job Card

Classroom Aids:

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

Tools & Equipment needed : Soft Flow Dyeing Machine, Apron, head cap, mask, shoe, Fabric rolls, Fabric trolley, Pen & Pencil , Work method posters, pictures, videos. Hot air gun, scissor, measuring cylinder, weighing balance

Module No. 2: Machine parts with their functions and Operating the machine

Outcome: Identify different machine parts & demonstrate their functions , Perform preparatory activities for operating the machine and Operate the machine for specified tasks as per requirement.

Theory Content:

- Explanation of the objectives of soft flow dyeing process.
- Describe different components of a soft flow dyeing machine.
- Study the function of the components of the dyeing machine.
- Differentiate between jet dyeing and soft flow dyeing.
- Study about material to liquor ratio. Explain the features of soft flow dyeing.
- Study about the dyes and auxiliary chemicals. Understanding mixing & dissolving techniques of various dyes & chemicals.
- Study about Controlling and monitoring programmed electronic equipments of the machine.
- Study about process parameters such as heating/ cooling gradient, exhaustion / fixation time, etc.
- Study different dyeing faults and method of trouble shooting them.

Practical Content:

- Identify different components of a soft flow dyeing machine and demonstrate their functions.
- Demonstration on Pressurizing and de pressurizing system, Level indicator with level sensor , Main panel , Service tank , feed pump, valves, stirring function and dosing control systems of the machine.

- Demonstration of preparatory activities for operations in the machine.
- Preparation of the chemical/dye-stuff required.
- Demonstration of injecting the chemical in the machine tank.
- Live demonstration of the operations of the machine & the plc programs.
- Demonstration of checking the parameters of the machine during the dyeing process.
- Switching the main power, Opening the steam, air and water valve , during starting of machine.
- Demonstration of Operating the main panel.
- Demonstration of Placing the right box for dyeing , Loading of the machine.
- Demonstration of how to add of dyes in main tank.
- Demonstration of draining last processed chemical and finally checking the shade.
- Demonstration of Unloading of Fabric from Soft Flow Dyeing machine.
- Instructions during shift change.

Tools & Equipment needed: Soft Flow Dyeing Machine, Apron, head cap, mask, shoe, Fabric rolls, Fabric trolley, Pen & Pencil , Work method posters, pictures, videos.

Module No. 3: Dyeing process of fabric and cleanliness of work area.

Outcome : Demonstrate the dyeing process of fabric with **Soft Flow Dyeing Machine and maintenance of Soft Flow Dyeing Machine** ensuring optimal machine performance, product quality and a safe working environment

Theory Content:

- Different terminologies related to textile wet processing,
- Dyeing process of different fibres – Cotton, Viscose, Wool, Silk, Jute, Linen, Polyester, Nylon, etc. and different popular blended fabric.
- Function of different dye bath assistants, additives and auxiliaries,
- Dyeing cycle, different process control parameters, shade matching,
- Different dyeing faults and its remedies,
- Overview of different types of dyeing machines – Winch, Jigger, J-box, CDR, Soft Flow Dyeing machine
- Soft Flow Dyeing Machine – Types of materials processed, different important parts of the m/c and their function, material flow path and process sequence, different process control parameters and dyeing cycle of Soft Flow Dyeing,
- Different control point setting of Soft Flow Dyeing
- Shade matching of dyed sample with standard sample
- Commonly occurred machine-problems, Procedure of troubleshooting techniques.
- Different check-points before starting of machine operation.
- Safety guidelines to be followed.
- Actions to be taken in emergency conditions.
- Maintaining overall Cleanliness and waste-management techniques in weaving floor.

Practical Content:

- Demonstrate the preparatory activities for operation of the dyeing machine
- Identify different important parts of the soft flow dyeing machines
- Demonstrate the different setting point of the soft flow dyeing machines
- Demonstrate the process sequence for dyeing in the soft flow machines
- Demonstrate the operation of soft flow dyeing machine

- Demonstrate loading and unloading of materials
- Demonstrate the chemical dosing operation during dyeing process
- Demonstrate the procedures for sample checking to check dyeing status
- Demonstrate the fabric jamming and entangle clearance process in soft flow dyeing machine
- Demonstrate the different emergency stop motions
- Demonstrate implementation procedure on emergency shutdown and evacuation
- Role play exercise for incoming and outgoing operator
- Practice in maintaining shift log and preparation of report

Classroom Aids:

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

Tools, Equipment and Other Requirements: Simulated models or Laboratory scale soft flow dyeing machine, material handling equipments, pH meter or paper, hot air gun, scissor, measuring cylinder, weighing balance, basic mechanical toolbox, Aprons, hand-gloves, PPE kits.

Module No. 4: Maintain occupational safety hazards at work place

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
- 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 strategies

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.
- Establish clear reporting procedures for machine running and performance
- Compliance with industry regulations: Understanding industry regulations, organizational policies and procedures. Ethical considerations. Health and safety compliance

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 No. 7: : Employability Skills (30 Hrs)**Key Learning Outcomes****Introduction to Employability Skills Duration: 1 Hour**

After completing this programme, participants will be able to:

1. Discuss the importance of Employability Skills in meeting the job requirements

Constitutional values - Citizenship Duration: 1 Hour

2. Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.
3. Show how to practice different environmentally sustainable practices

Becoming a Professional in the 21st Century Duration: 1 Hours

4. Discuss 21st century skills.
5. Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.

Basic English Skills Duration: 2 Hours

6. Use appropriate basic English sentences/phrases while speaking

Communication Skills Duration: 4 Hour

7. Demonstrate how to communicate in a well -mannered way with others.
8. Demonstrate working with others in a team

Diversity & Inclusion Duration: 1 Hour

9. Show how to conduct oneself appropriately with all genders and PwD
10. Discuss the significance of reporting sexual harassment issues in time

Financial and Legal Literacy Duration: 4 Hours

11. Discuss the significance of using financial products and services safely and securely.
12. Explain the importance of managing expenses, income, and savings.
13. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws

Essential Digital Skills Duration: 3 Hours

14. Show how to operate digital devices and use the associated applications and features, safely and securely
15. Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely

Entrepreneurship Duration: 7 Hours

16. Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges

Learning Outcome – Assessment Criteria

Module No.	Outcome	Assessment Criteria
1	Describe the preparatory and dyeing process along with Identify the roles and responsibilities of Soft Flow Dyeing Machine Operator	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1.1. Demonstrate the Principles of batch dyeing technique. 1.2. Explain different processes involved in soft flow machine. 1.3. Identify the role and responsibility of the dyeing machine operator. 1.4. Explain Step wise process flow of Soft Flow Dyeing Machine. 1.5. Demonstrate the dyeing operation of soft flow dyeing machine. 1.6. Demonstrate the loading and unloading of dyeing machine. 1.7. Demonstrate different functions of main panel. 1.8. Demonstrate maintaining shift logbook. 1.9. Explain the shift handover/takeover process.
2	Identify different machine parts & demonstrate their functions , Perform preparatory activities for operating the machine and Operate the machine for specified tasks as per requirement.	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 2.1 Describe different components of a soft flow dyeing machine. <ol style="list-style-type: none"> 2.2 Explain the objectives of soft flow dyeing process. 2.3 Explain material to liquor ratio, mixing & dissolving techniques of various dyes & chemicals. 2.4 Explain different dyeing faults and method of trouble shooting them. 2.5 Identify different components of a soft flow dyeing machine and demonstrate their functions. 2.6 Demonstrate working of Pressurizing and de pressurizing system, Level indicator with level sensor , Main panel , Service tank , feed pump, valves, stirring function of machine. 2.7 Understand and follow the instruction from lot card and programme book. 2.8 Turn the power ON and then open compressed air, water valve and steam. 2.9 Prepare all the chemicals for dyeing with required concentration. 2.10 Check the quality and lot number of the fabric before loading by checking the label. 2.11 Load the fabric in the machine by using

Module No.	Outcome	Assessment Criteria
		<p>take up roller.</p> <p>2.12 Turn on circulating pump and start the machine.</p>
3	<p>Demonstrate the dyeing process of fabric with Soft Flow Dyeing Machine and maintenance of Soft Flow Dyeing Machine ensuring optimal machine performance, product quality and a safe working environment</p>	<p>After completion of this module students will be able to:</p> <p>3.1. Explain the term shade percentage , exhaustion percentage etc.</p> <p>3.2 Demonstrate the effect of dyeing temperature, time on shade of sample.</p> <p>3.3 Explain quality parameters in Soft Flow Dyeing Machine.</p> <p>3.4 Cut right size of sample as per the time / no. of turn mentioned in the order.</p> <p>3.5 Perform soaping the dyed sample and also washing & drying.</p> <p>3.6 Compare the dyed sample with the standard sample.</p> <p>3.7 Demonstrate different types of cleaning tools and substances and their use.</p> <p>3.8 Remove accumulated dust and dirt from the dyeing machine.</p> <p>3.9 Clean the circulation line and filter , level sensor and temperature sensor properly.</p> <p>3.10 Maintain the work area, tools and machines.</p> <p>3.11. Collect all the waste and store at designated place.</p>
4	<p>Apply safe working practices at work place</p>	<p>After completion of this module students will be able to:</p> <p>4.1 Demonstrate of effective cleaning techniques</p> <p>4.2 Execute machine specific cleaning procedures</p> <p>4.3 Create a checklist for routine cleaning tasks</p> <p>4.4 Demonstrate the use of protective clothing/equipment for the specific tasks and work conditions</p> <p>4.5 Describe the importance of PPE kit</p> <p>4.6 Demonstrate the correct use of safety gear.</p> <p>4.7 Identify electrical hazards, including power supply issues, loose cables and equipment malfunctioning</p> <p>4.8 Detect health hazards (such as untreated injuries and contagious illness/ zoonotic diseases).</p> <p>4.9 Maintain Fire safety and prevention of fire hazards in workplace [fire extinguishers, fire Alarm, fire exits]</p> <p>4.10 Ensure use of general health and safety equipment and materials in the workplace first aid equipment</p>

Module No.	Outcome	Assessment Criteria
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	Qty
1	Soft Flow Dyeing Machine	2
2	Apron	30
3	Head cap	30
4	Mask	30
5	Shoe	30
6	Hand gloves	30
7	Fabric rolls	As required
8	Fabric trolley	As required
9	10 x 10 ml syringes	5
10	Stainless steel bucket	5
11	Droppers	5
12	Perforated steel dyers spoon	5
13	Glass reagent jars	5
14	Pocket color wheel , color mixing guide	30

SI No	Items Name	Qty
15	Plastic beaker	5
16	Stirrer	5
17	Thermometer	2
18	Dyes	As required
19	Auxiliary chemicals	As required
20	Pressure gauge	2
21	Fire extinguishers	2
22	Fire Alarm	2
23	First aid equipment	5

Marks Distribution

Outcome	Outcome Code	Total Th hrs	Total Pr hrs	Total OJT hrs
Describe the preparatory and dyeing process along with Identify the roles and responsibilities of Soft Flow Dyeing Machine Operator	TXT/3707/OC1	30	120	0
Identify different machine parts & demonstrate their functions, Perform preparatory activities for operating the machine and Operate the machine for specified tasks as per requirement.	TXT/3707/OC2	30	120	0
Demonstrate the dyeing process of fabric with Soft Flow Dyeing Machine and maintenance of Soft Flow Dyeing Machine ensuring optimal machine performance, product quality and a safe working environment	TXT/3707/OC3	30	190	0
Apply safe working practices at work place	TXT/3707/OC4	30	110	0
Demonstrate a comprehensive effective workplace communication strategies	TXT/3707/OC5	30	110	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	TXT/3707/OC6	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0