

Syllabus for Maintenance Technician for Weaving Preparatory Machines

Course Name	Maintenance Technician for Weaving Preparatory Machines
Sector	Textiles & Handlooms
Course Code	TXT/2024/MTWM/360
Level	4
Occupation	Maintenance Technician for Weaving Preparatory Machines
Job Description	The Maintenance Technician is responsible for conducting routine maintenance work, preventive maintenance work, troubleshooting mechanical and electrical problems and effective and speedy repairing of different machines related to weaving preparatory processes like winding, warping, sizing etc. to ensure optimal machine-utilization, quality of warp and weft yarns and production efficiency in weaving in turn.
Course Duration	Total Duration 420 Hrs (T- 90, P- 210 , OJT-60 and ES-60)
Trainees' Entry Qualification	Grade 12 – Regular OR Vocational OR 10th grade pass plus 2-year NTC/NAC OR Completed 2nd year of 3-year diploma (after 10th) and pursuing regular diploma OR 10th grade pass and pursuing continuous schooling OR 10th grade pass with 2 years' experience OR Previous relevant Qualification of NSQF Level 3.0 with minimum education as 8th Grade pass with 3 year relevant experience OR Previous relevant qualification of NSQF Level 3.5 with 1.5 year relevant experience
Trainers Qualification	B. Tech/B.E. in Textile Technology/Engineering from AICTE/UGC recognized Engineering College/ university with one-year experience in the relevant field. OR 03 years Diploma in Textile Technology/Engineering 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) [Multiple of 30]
1.	Basic Understanding of the Technology and Roles & Responsibility	Illustrate various preparatory processes in weaving alongwith the roles and responsibility of Weaving Preparatory Machine Maintenance Technician	20	10		30

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	OJT (Hrs.)	Total (Hrs) [Multiple of 30]
2.	Maintenance of machine performance and operational standards	Execute maintenance in preparatory machines like warping machine, winding machine, sizing machine ensuring optimal machine performance and product quality	30	120		150
3.	Maintain occupational safety hazards at work place	Apply safe working practices at work place	20	40		60
4.	Workplace communication strategies	Demonstrate a comprehensive effective workplace communication strategies	20	40		60
5.	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	-	--	60	60
6	Employability Skill	As per guided curriculum	60	--	--	60
TOTAL:			150	210	60	420

SYLLABUS:**Module 1: Basic Understanding of the Technology and Roles & Responsibility**

Outcome: Illustrate various preparatory processes in weaving alongwith the roles and responsibility of Weaving Preparatory Machine Maintenance Technician

Theory Content:

- Basics of Textile Industry and its significance in domestic and global markets
- Basics of fabric formation and principles of weaving, understanding of warp and weft. Importance of warp and weft preparation.
- Introduction to different weaving-preparatory processes. Direct warping, sectional warping , winding , warp sizing etc. ... objectives and principles.
- Role and responsibility of the maintenance technician.
- Basic sequences of work in weaving-preparatory floor, concept of job-card, production flow, shift handover etc.
- Regular check-points of preparatory machines, taking machine status.
- Different types of safety protocols
- Documentation procedure for machine performance.
- Understanding and Review of work orders and pending tasks
- Introduction to different driving mechanisms of machine.

Practical Content:

- Identify different types of preparatory machines.
- Preparation of shift handover/takeover process
- Demonstrations of procedures for checking the machine status
- Understanding and preparation of the implementation-plan of the work orders
- Communicate with incoming/outgoing shift
- Checking of the safety hazards
- Identify and inspect the tools and equipment
- Handing over/taking over documentation preparation
- Identification of different driving mechanisms of machine.

Classroom Aids:

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

Tools, Equipment and Other Requirements: Simulated models or miniatures versions of warping machines, winding machines, sizing machines etc. different structures or models of belt-drive, gear-train drive etc., basic mechanical toolbox, electrical toolbox, Aprons, hand-gloves, PPE kits.

Module 2: Maintenance of machine performance and operational standards

Outcome: Execute maintenance in preparatory machines like warping machine, winding machine, sizing machine ensuring optimal machine performance and product quality

Theory Content:

- Overview of different types of weaving-preparatory machines
- Basic principles of warping machines, winding machines and sizing machines – different types.
- Different parts of warping machines, winding machines and sizing machines, functions of each component.
- Driving mechanisms of different parts of warping machines, winding machines and sizing machines.
- Different types of motors used in warping machines, winding machines and sizing machines.
- Motor rating and Frame size of Motors
- Procedures of routine maintenance: Lubrication procedures, Belt tensioning and replacement
- Different Setting points in case of warping machines, winding machines and sizing machines.
- Commonly occurred machine-problems in warping machines, winding machines and sizing machines -- Procedure of troubleshooting techniques and diagnostic methods
- Major repairs and overhauls procedures
- Different areas and methods of Electrical and electronics maintenance: Wiring and connection maintenance, sensor and actuator maintenance.
- Safety guidelines to be followed
- Actions to be taken in emergency conditions.
- Commonly occurred machine-generated warping faults and their remedies.
- Procedures of regular monitoring and preventive maintenances, recording of facts, documentation procedures.
- Different check-points while inspecting the warping machines, winding machines and sizing machines.
- Maintaining overall Cleanliness and waste-management techniques in machine floor.

Practical Content:

- Identify, locate and apply lubricants on a working warping machines / winding machines / sizing machine. Measure and adjust belt tension on a warping machines / winding machines / sizing machine.
- Disassembling and re-assembling of different parts of warping machines / winding machines / sizing machine.
- Checking of Motors for vibration / burnt out. Replace defective Motor.
- Replace worn-out belt if any.
- Simulate common machine-problems and use diagnostic tools
- Identify electrical and electronic malfunctions and use diagnostic tools to repair
- Practice to replace rapier head in sequential steps
- Demonstrate settings, calibration and alignment procedure
- Identify and replace damaged wiring
- Inspect and maintain the sensors and actuators
- Replace the defective items and test it.
- Identify different machine-generated warping faults ...and their remedies.
- Demonstrate implementation procedure on emergency shutdown and evacuation
- Role play exercise for incoming and outgoing maintenance technicians
- Practice in maintaining shift log and preparation of report
- Demonstration of practices for Maintaining overall cleanliness, and waste-management techniques in warping machines / winding machines / sizing machines.

Classroom Aids:

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

Tools, Equipment and Other Requirements: Simulated models or miniatures versions of warping machines/winding machines/sizing machine, warps of different woven fabrics of different weaves and designs, basic mechanical toolbox, electrical toolbox, Aprons, hand-gloves, PPE kits,

Module No. 3: 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 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. 4: 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 9: 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 6 : Employability Skills (60 Hrs)

Key Learning Outcomes

Introduction to Employability Skills Hours

Duration: 1.5

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 Hours

Duration: 1.5

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 Hours

Duration: 2.5

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 Hours

Duration: 10

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
Hours

Duration: 2

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

Communication Skills
5 Hours

Duration:

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
Hours

Duration: 2.5

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
Hours

Duration: 10

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
7 Hours

Duration:

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
5 Hours

Duration:

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
8 Hours

Duration:

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	Illustrate various preparatory processes in weaving alongwith the roles and responsibility of Weaving Preparatory Machine Maintenance Technician	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 1.1 Describe the fundamental of the textile industry and articulate its significance in both domestic and global markets 1.2 Explain the principles of fabric formation, emphasizing the importance of warp and weft in the weaving process. 1.3 Define the role and responsibilities of a maintenance technician in the context of weaving-preparatory processes. 1.4 Execute the documentation procedures for recording and analyzing machine performance in the weaving-preparatory phase. 1.5 Identify and comprehend different driving mechanisms used in weaving-preparatory machines. 1.6
2	Execute maintenance in preparatory machines like warping machine, winding machine, sizing machine ensuring optimal machine performance and product quality	<p>After completion of this module students will be able to:</p> <ol style="list-style-type: none"> 2.1 Identify various types of weaving preparatory machines 2.2 Evaluate fundamental principles underlying warping, winding and sizing machines 2.3 Identify and select the components of each machine and their functions 2.4 Identify and apply lubricants on working

Module No.	Outcome	Assessment Criteria
		machine 2.5 Measure and adjust belt tension on machine 2.6 Disassemble and reassemble different machine parts 2.7 Replace worn-out belts 2.8 Identify and diagnose common machine problems 2.9 Troubleshoot electrical and electronic malfunctions of the machine 2.10 Demonstrate machine setting, calibration and alignment 2.11 identify and replace damaged wiring. 2.12 Implement emergency shutdown and evacuation procedures 2.13 Assess communication, coordination and handover procedures 2.14 Execute cleanliness and waster management practices
3	Apply safe working practices at work place	After completion of this module students will be able to: 3.1 Demonstrate of effective cleaning techniques 3.2 Execute machine specific cleaning procedures 3.3 Create a checklist for routine cleaning tasks 3.4 Demonstrate the use of protective clothing/equipment for the specific tasks and work conditions 3.5 Describe the importance of PPE kit 3.6 Demonstrate the correct use of safety gear. 3.7 Identify electrical hazards, including power supply issues, loose cables and equipment malfunctioning 3.8 Detect health hazards (such as untreated injuries and contagious illness/ zoonotic diseases). 3.9 Maintain Fire safety and prevention of fire hazards in workplace [fire extinguishers, fire Alarm, fire exits] 3.10 Ensure use of general health and safety equipment and materials in the workplace first aid equipment

Module No.	Outcome	Assessment Criteria
4	Demonstrate a comprehensive effective workplace communication strategies	<p>After completion of this module students will be able to:</p> <p>4.1 Demonstrate the purpose of each team member and their involvement in determining goals</p> <p>4.2 Identify tasks between team members and their own processes</p> <p>4.3 Apply effective communication strategies in a practical context</p> <p>4.4 Exhibit enterprise ethical standards in workplace interactions</p> <p>4.5 Apply good communication environmental practices in practical workplace</p> <p>4.6 Simulate/Role play ethical dilemmas in the work place</p> <p>4.7 Illustrate familiarity with relevant industry standards and regulations.</p> <p>4.8 Explain the organizational policies and procedures</p>
5	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT)
6	Employability Skills	As per guided curriculum

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

SI No	Items Name	Specification	Qty
1	Simulated models or miniatures versions of warping machines		1
2	Winding machines		1
3	Sizing machines		1
4	Mechanical toolbox,		30
5	Electrical toolbox		30
6	Computer	Latest configuration	1
7	White board	Standard 6'x4'	1
8	Marker		As required
9	Chart papers		As required

SI No	Items Name	Specification	Qty
10	Projector		1
11	Aprons	Standard	30
12	Ear plugs		30
13	Eye and facial protection		30
14	Muffs		30
15	Head-wear		30
16	Hand gloves		30
17	Mesh aprons		30
18	Fire extinguishers		2
19	Fire Alarm		2
20	First aid equipment		3

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Illustrate various preparatory processes in weaving along with the roles and responsibility of Weaving Preparatory Machine Maintenance Technician	TXT/3711/OC1	30	160	0
Illustrate various preparatory processes in weaving along with the roles and responsibility of Weaving Preparatory Machine Maintenance Technician	TXT/3711/OC1	30	160	0
Execute maintenance in preparatory machines like warping machine, winding machine, sizing machine ensuring optimal machine performance and product quality	TXT/3711/OC2	60	180	0
Apply safe working practices at work place	TXT/3711/OC3	30	150	0
Demonstrate a comprehensive effective workplace communication strategies	TXT/3711/OC4	30	160	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	TXT/3711/OC5	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0