Model Curriculum

QP Name: Shuttle Loom Operator cum Pirn Winder
(Electives: Power loom, Automatic shuttle loom)

QP Code: TSC/Q2210

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

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Training Parameters

Sector	Textile
Sub-Sector	Weaving - Textiles
Occupation	Weaving
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8152.9900
Minimum Educational Qualification and Experience	Basic Literacy and Numeracy with 0-6 months of experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	19/03/2021
Next Review Date	19/03/2026
NSQC Approval Date	
QP Version	1.0
Model Curriculum Creation Date	19/03/2021
Model Curriculum Valid Up to Date	19/03/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	300 Hours
Maximum Duration of the Course	360 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner will be able to:

- Take charge and handover shift of shuttle loom operator cum pirn winder.
- Carry out loom operations in shuttle loom.
- Mend warp and weft break while weaving on a shuttle loom.
- Operate pirn winding machine in shuttle loom shed.
- Carry out weft replenishment activity in power loom/prepare weft replenishment device in automatic shuttle loom.
- Maintain work area, tools and machines as per guidelines.
- Follow greening and energy conservation activities as per guidelines.
- Describe the importance of health, safety and security at workplace.
- Communicate and work effectively in a team.
- Comply with organizational and industry standards.

Compulsory Modules

The table lists the modules, their duration, and mode of delivery.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration (HH:MM)
Bridge Module	**03:00**	**01:00**			**04:00**
Module 1: Introduction to weaving mill, position and responsibilities of a shuttle loom operator cum pirn winder	03:00	01:00			04:00
TSC/N2217 Taking charge and handing over the shift to Shuttle loom operator cum pirn winder NOS Version No. 1 NSQF Level 4	**08:00**	**18: 00**			**26:00**
Module 2: Taking charge and handing over of a shift	08:00	18:00			26:00
TSC/N2218 Carry out loom operation and mending of warp and weft breaks in shuttle loom NOS Version No. 1 NSQF Level 4	**36:00**	**84:00**			**120:00**

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration (HH:MM)
Module 3: Operate the shuttle loom	20:00	40:00			60:00
Module 4: Attend warp breakages	12:00	28:00			40:00
Module 5: Attend weft breakages	04:00	16:00			20:00
TSC/N2219 Operating the pirn winding machine NOS Version No. 1 NSQF Level 4	**14:00**	**31:00**			**45:00**
Module 6: Stripping of empty pirns in pirn winding machine	05:00	10:00			15:00
Module 7: Pirn winding machine operation	09:00	21:00			30:00
TSC/N9015 Follow machine, safety and organizational guidelines in textile sector NOS Version No. 1 NSQF Level 4	**18:00**	**42:00**			**60:00**
Module 8: Maintaining the work area, tools and machines	02:00	06:00			08:00
Module 9: Greening and energy conservation in the textile sector	02:00	05:00			07:00
Module 10: Health, safety, and response to emergencies at the workplace	09:00	21:00			30:00
Module 11: Organizational standards and policies	05:00	10:00			15:00
TSC/N9016 Follow teamwork, adaptability and communication guidelines in textile sector NOS Version No. 1 NSQF Level 4	**5:00**	**10:00**			**15:00**
Module 12: Teamwork, trust, and communication	03:00	07:00			10:00
Module 13: Adaptability	02:00	03:00			05:00
Total Duration	**84:00**	**186:00**			**270:00**

Elective Modules

The table lists the elective modules, their duration, and mode of delivery.

Elective 1: Weft replenishment in power loom

NOS and Module Details	Theory Duration (HH:MM)	Practical Duration (HH:MM)	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration (HH:MM)
TSC/N2220 Carry out weft replenishment activity in power loom NOS Version No. 1 NSQF Level 4	**06:00**	**24:00**			**30:00**
Module 14: Weft replenishment in power loom	06:00	24:00			30:00
Total Duration	**06:00**	**24:00**			**30:00**

Elective 2: Weft replenishment in automatic shuttle loom

NOS and Module Details	Theory Duration (HH:MM)	Practical Duration (HH:MM)	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration (HH:MM)
TSC/N2221 Preparation of weft replenishment device in automatic shuttle loom NOS Version No. 1 NSQF Level 4	**06:00**	**24:00**			**30:00**
Module 15: Prepare the weft replenishment device in an automatic shuttle loom	06:00	24:00			30:00
Total Duration	**06:00**	**24:00**			**30:00**

Module Details

Module 1: Introduction to weaving mill, position and responsibilities of a shuttle loom operator cum pirn winder

Bridge Module

Terminal Outcomes:

- Describe the basics of shuttle loom weaving.
- Discuss the raw materials required for the shuttle loom weaving operation.
- Explain the position of a shuttle loom operator in the hierarchy line and the type of role to play in a weaving mill.
- Discuss the rules and regulations of the weaving mill.

Duration: ***03:00***	**Duration**: ***01:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the basics of weaving by shuttle loom i.e., process flow, fabric specification, material flow, type of yarn used, and different types of weave. • Define production, efficiency, machine speed, weft insertion rate, etc. • Define hierarchy in the organization and list out the order of department and people involved in the hierarchy line in a weaving mill. • Describe the roles and responsibilities of the shuttle loom operator. • List the rules and regulations followed in a weaving mill like shift timing and duration, limits of leave and holidays, etc. • List the socio-economic benefits of training as a shuttle loom weaver (power loom/automatic shuttle loom). • Identify the types of yarns and weaves being woven and their end-use.	• Choose different kinds of yarn based on the count and type of the yarn.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for shuttle loom (power/automatic, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable and hazardous wastes, video visuals on solar power, package and storage materials - covers, bags, wrappers, box, etc, 2 Shuttle loom (power/automatic) and 1 pirn winding machine in running production condition with minimum 25 empty pirns with 5Kg yarn, waist bag, waste samples, calculator, samples of operational tools, record books, seating arrangement for 25 people, parts of shuttle loom (power loom/automatic loom) and pirn winding machine labelled, signboards, sample logbooks, and formats.	

Module 2: Taking charge and handing over of a shift

Mapped to TSC/N2217, v1.0

Terminal Outcomes:

- Demonstrate the process of taking charge and handing over of shift.
- Discuss the protocols to be followed while taking charge and handing over of shift.
- Discuss the reporting formats to be submitted at the end of the shift.
- Discuss the quality requirements of the woven fabrics.

Duration: ***08:00***	**Duration:** ***18:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of attending shift on time. • Classify the operational tools required for shuttle loom operation and pirn winding operation. • Define the functions of various parts of a shuttle loom (power loom/automatic loom). • Describe the process of shift handover and shift takeover. • Describe shift checklist, shift log report, and its significance. • Read a shift handover log report to understand the work to be done. • Discuss the need for exchanging production information with another operator. • Describe the importance of keeping a logbook. • Discuss protocol and formats for reporting any abnormalities. • Describe the process of complaint redressal. • Explain the significance of quality fabric production. • Discuss the types of woven fabric grading points. • Discuss the potential hazards and its causes at the woven fabric production department.	• Demonstrate the process of taking charge of the shift. • Demonstrate the preparation of report as per the standard protocol for shift performance and reporting abnormalities. • Demonstrate procedure of handing over of shift. • Choose the tools required for shuttle loom operation. • Demonstrate the process of preparation of a sample production log report. • Recognize abnormal sounds, vibrations, and operations in running shuttle loom and state their causes and remedies. • Demonstrate the process of taking supply and production stock. • Inspect the condition of raw materials and tools available at the production area and report the deviation as per the standard protocol. • Demonstrate the method of collecting shift details from the previous shift operator by following the SOP. • Demonstrate end of the shift activities like cleaning, disposal of waste, etc. • Examine fabric to identify defects caused by various factors such as machine, material, and atmospheric conditions, etc. • Examine pirns to identify defects caused by various factors such as machine, material, and atmospheric conditions, etc.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	

Process flow chart of weaving department, sample tools, and accessories for shuttle loom (power/automatic, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable, and hazardous wastes, 1 pirn winding machine in running production condition with minimum 25 empty pirns with 5Kg yarn, waist bag, waste samples, calculator, samples of operational tools, record books, seating arrangement for 25 people

Module 3: Operate the shuttle loom

Mapped to TSC/N2218, v1.0

Terminal Outcomes:

- Demonstrate the process of operating the shuttle loom.
- Explain the various accessories used in the shuttle loom operation.
- Demonstrate the process of creating of shedding and weft pattern in the shuttle looms.
- Demonstrate the process of rectifying the running woven fabric defects.
- Demonstrate the other work responsibilities in the shuttle loom department.

Duration: *20:00*	**Duration: *40:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss different types of shuttles used in shuttle loom. • Discuss the various types of looms available for woven fabric production. • Discuss the available types of yarns and their weavability. • Classify the available types of emery paper and their usage in the shuttle loom weaving department. • Describe the various type of shedding mechanism and shuttle changing mechanisms in the shuttle looms. • Discuss the weaving cycle of loom and the timings of primary, secondary and tertiary motions. • Discuss the tolerance limits of woven fabric parameters such as cloth width, Ends Per Inch (EPI), Picks Per Inch (PPI), etc. • Explain the organization quality systems such as 5S, ISO, SA, etc. • Classify different woven fabric structures such as plain, satin, twill, jacquard, dobby designs, etc. • Discuss the storage requirements of weft pirns as per the weft pattern. • Discuss the standard repair time of various running fabric defects. • Discuss the significance of maintain the shuttle loom department clean. • Discuss the common abnormalities in the shuttle looms. • Discuss the significance of using prescribed thrumbs while mending the	• Demonstrate the inching operation in the shuttle loom. • Demonstrate the process of starting and stopping the shuttle loom without weft crack. • Demonstrate adjustment of warp tension on the running shuttle loom. • Demonstrate the process of operating the shuttle loom. • Calculate the number of pirns required for weaving. • Demonstrate the process of preparing the weft shuttle changing pattern for the given weft pattern. • Demonstrate the process of preparing the shedding order of heald frames for the given fabric structure. • Demonstrate the process of rectifying wrong drawing, wrong denting, missing and double ends, etc. within the standard repair time. • Demonstrate the process of clearing the surface damages of the shuttle using prescribed emery sheet. • Demonstrate the process of patrolling the allotted shuttle looms for the quality check. • Demonstrate the method of cleaning the allotted looms and doffing the cloth roll.

running warp defects.	
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for shuttle loom (power/automatic, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable, and hazardous wastes, package and storage materials - covers, bags, wrappers, box, etc, 2 shuttle loom (power/automatic), waist bag, waste samples, samples of operational tools, record books, seating arrangement for 25 people, parts of shuttle loom (power loom/automatic loom) and pirn winding machine labelled, signboards, sample logbooks, and formats.	

Module 4: Attend warp breakages

Mapped to TSC/N2218, v1.0

Terminal Outcomes:

- Demonstrate the process of attending and mending the warp breakages.
- Classify the various types of fabric defects caused by warp breaks.
- Discuss the time tolerance to attend the warp breakages in the shuttle loom operation.

Duration: *12:00*	**Duration: *28:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the importance of using allotted thrumbs for mending the warp defects. • Discuss the method for mending broken warp ends. • Discuss the reasons for warp breakages in shuttle loom operation with their probable causes. • Classify the types of fabric defects caused by warp breakages. • Classify mendable and non-mendable woven fabric warp defects. • Discuss the impacts of warp breaks on the quality of the woven fabric. • Discuss the standard time allowed of attending single and multiple warp breaks. • Discuss the relation between the series warp break and shuttle condition.	• Demonstrate the method of identifying and repairing warp breakages in the shuttle looms. • Demonstrate the process of staring the shuttle loom after mending the warp break. • Demonstrate the method of unweaving a warp float. • Demonstrate the method of drawing the warp end through heald eye and reed dent as per drawing and denting plan within the specified time tolerance. • Demonstrate the method of resetting the signal lamp after repairing the warp break.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for shuttle loom (power/automatic, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable, and hazardous wastes, video visuals on solar power, Package and storage materials - covers, bags, wrappers, box, 2 shuttle looms (power/automatic), waist bag, waste samples, samples of operational tools, record books, seating arrangement for 25 people, parts of shuttle loom (power loom/automatic loom) and pirn winding machine labelled, signboards, sample logbooks, and formats.	

Module 5: Attend weft breakages

Mapped to TSC/N2218, v1.0

Terminal Outcomes:

- Demonstrate the process of attending and mending weft breakages.
- Classify the various types of fabric defects caused by weft breaks.
- Discuss the time tolerance to attend the weft breakages in the shuttle loom operation.
- Demonstrate the process of resetting shedding and weft pattern in the shuttle looms.

Duration: ***04:00***	**Duration:** ***16:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the method for mending broken weft yarn. • Discuss the reasons for weft breakages in shuttle loom operation with their probable causes. • Classify the types of fabric defects caused by weft breakages. • Classify mendable and non-mendable woven fabric warp defects. • Discuss the impacts of weft breaks on the quality of the woven fabric. • Discuss the standard time allowed of attending weft breaks. • Discuss the relation between the frequent weft breaks and shuttle condition.	• Demonstrate the method of identifying and repairing weft breakage in the shuttle looms. • Demonstrate the process of staring the shuttle loom after mending the weft break by following the weft design pattern. • Demonstrate the method of unweaving a weft float. • Demonstrate the method of drawing the weft through shuttle eye and guides within the specified time tolerance. • Demonstrate the method of resetting the signal lamp after repairing the weft break. • Demonstrate the process of resetting the weft pattern and warp shedding pattern after mending the weft breakage.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for shuttle loom (power/automatic, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable, and hazardous wastes, video visuals on solar power, package and storage materials - covers, bags, wrappers, box, 2 shuttle looms (power/automatic), waist bag, waste samples, samples of operational tools, record books, seating arrangement for 25 people, parts of shuttle loom (power loom/automatic loom) and pirn winding machine labelled, signboards, sample logbooks, and formats.	

Module 6: Stripping of empty pirns in pirn winding machine

Mapped to TSC/N2219, v1.0

Terminal Outcomes:

- Demonstrate the process of collecting pirns and stripping the yarn from the pirn.
- Demonstrate the process of inspecting the surface damages of the pirns.

Duration: *05:00*	**Duration:** *10:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the importance of cleaning the pirn winding machine. • Classify the defects caused by faulty pirn. • Explain the procedure of collecting empty pirns and stripping out weft yarn (bunch waste). • Discuss the requirement for segregation of pirns with excess yarns. • Explain method of storing of broken and damaged pirn at the designated place. • Explain the various types of pirn damages with causes in the pirn winding operation. • Discuss the requirement of inspecting the condition of brass ferrule or reflecting tape.	• Demonstrate the method of segregating and cleaning the empty pirns. • Demonstrate the process of stripping out the weft yarn from the pirns. • Demonstrate the process of polishing the pirns using prescribed polish paper. • Demonstrate the process of sticking the reflecting tape on the surface of the pirns.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for pirn winding machine, 1 pirn winding machine in running production condition with minimum 25 empty pirns with 5 Kg yarn, waist bag, waste samples, calculator, samples of operational tools, record books, seating arrangement for 25 people, parts of shuttle loom (power loom/automatic loom) and pirn winding machine labelled, signboards, sample logbooks, and formats.	

Module 7: Pirn winding machine operation

Mapped to TSC/N2219, v1.0

Terminal Outcomes:

- List the objectives of pirn winding machine operation.
- Demonstrate the process of operating the pirn winding machine.
- Discuss the other work responsibilities in the pirn winding section.

Duration: *09:00*	**Duration:** *21:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss various motions of pirn winding machine-like bunch building, auto pirn change, thread stop motion, etc. • Explain the functions of various parts in the pirn winding machine. • Brief the reasons for different defects and their remedies in pirn winding operation. • Explain the method of loading of empty pirns in pirn winding machine magazine. • Discuss the roles and responsibilities of a pirn winding operator with the limits of responsibility. • Describe the steps to calculate the yarn required of each colour for winding the required number of pirns. • Discuss the methods of storing the full weft pirns. • Discuss the importance of attending yarn breakages using hand knotters. • Discuss the common reasons for frequent yarn breakages in the pirn winding operation. • Discuss the requirement of reserve bunch yarn. • Discuss the potentials hazards in the pirn winding operation with causes. • Discuss the various types of pirns and its associated identification number. • Discuss the types of knots used in pirn winding operation. • Discuss the production efficiency and waste percentage in the pirn winding section.	• Demonstrate the method of identifying and repairing of yarn breakages in the pirn winding machine. • Demonstrate method of weft yarn threading from cone to bobbin. • Demonstrate the process of starting and stopping the pirn winding machine. • Demonstrate the method of doffing the full pirn. • Demonstrate the method of mending the broken yarn in the pirn winding machine. • Demonstrate the process of transporting and storing the full pirn using prescribed material handling equipment. • Recognize abnormal sounds in a pirn winding machine by listening carefully.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	

Tools, Equipment, and Other Requirements
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for pirn winding machine, 1 pirn winding machine with 25 empty pirns, 5Kg weft yarn, recyclable, non-recyclable and hazardous wastes, video visuals on solar power, package and storage materials - covers, bags, wrappers, box, etc, waist bag, waste samples, calculator, samples of operational tools, record books, Seating arrangement for 25 people, parts of shuttle loom (power loom/automatic loom) and pirn winding machine labelled, signboards, sample logbooks, and formats.

Module 8: Maintaining the work area, tools and machines

Mapped to TSC/N9015, v1.0

Terminal Outcomes:

- Demonstrate the method of maintaining the work area, tools, and machines in the weaving department.
- Explain the objective of tools, PPE used in the weaving department.

Duration: *02:00*	**Duration: *06:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Differentiate various types of tools used for cleaning and maintenance. • Explain the objectives of each maintenance and cleaning tool used in the operation of shuttle loom (power loom/automatic loom) and pirn winding machine. • Discuss the significance of safe handling procedures of tools and equipment. • State the importance and decipher written instructions on the job card for the allocated machines. • Discuss the significance of minimizing the wastage of material, effort, and time. • Prepare a draft schedule for cleaning and waste collection for the assigned job role. • Classify the available types of Material handling equipment and handling methods used in the weaving department. • Discuss the types and importance of PPE used in the weaving department.	• Demonstrate the method of handling procedures of raw materials, tools, PPE, and machines. • Choose the appropriate tools and equipment for shuttle looms. • Demonstrate the process of cleaning and maintain the shuttle loom and pirn winding machine. • Demonstrate the process of collecting and storing the worn-out parts.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for shuttle loom (power/automatic, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable, and hazardous wastes, video visuals on solar power, package and storage materials - covers, bags, wrappers, box, 2 shuttle loom (power/automatic) and 1 pirn winding machine in running production condition with minimum 25 empty pirns with 5Kg yarn, waist bag, waste samples, calculator, samples of operational tools, record books, ancillaries, material handling equipment and tool kits of operational, cleaning maintenance activities, seating arrangement for 25 people.	

Module 9: Greening and energy conservation in the textile sector

Mapped to TSC/N9015, v1.0

Terminal Outcomes:

- Demonstrate the process of identifying the recyclable, non-recyclable, and hazardous wastes in the weaving department.
- Discuss the methods to optimize usage of material and resources at the workplace.

Duration: *02:00*	**Duration: *05:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the terms of pollution control, soil conservation, waste management, recycle, forest conservation, global warming, organic products, etc. • List the different sources of energy. • Discuss the impact of using non-biodegradable materials on the environment. • Evaluate the different ways to conserve energy in a textile factory. • Discuss the significance of conserving the environment and energy resources. • Discuss the significance of specified usage of resources at the work area.	• Demonstrate the method of segregating recyclable, non-recyclable, hazardous wastes in the weaving department. • Demonstrate the method of handling and storage of waste materials. • Demonstrate the method of switching of the prescribed machine and light switches in the weaving department.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for shuttle loom (power/automatic, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable and hazardous wastes, video visuals on solar power and sources of energy, package and storage materials - covers, bags, wrappers, box, etc, 2 shuttle loom (power/automatic) and 1 pirn winding machine in running production condition with minimum 25 empty pirns with 5Kg yarn, waist bag, waste samples, calculator, samples of operational tools, record books, seating arrangement for 25 people.	

Module 10: Health, safety, and response to emergencies at the workplace

Mapped to TSC/N9015, v1.0

Terminal Outcomes:

- Demonstrate the method of performing first aid at the workplace.
- Demonstrate the method of following fire safety protocol in the weaving department.
- Demonstrate the method of recognizing various hazardous materials in the weaving department.

Duration: *09:00*	**Duration: *21:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of safe handling procedures of tools and equipment. • Discuss the importance and standard procedure for responding to emergencies. • Discuss the importance and standard procedure for housekeeping and material handling. • Discuss the impacts and hazards of unsafe workplace conditions and procedures in the textile industry (operational, environmental, personal, ergonomic, chemical, electric, fire) and methods to avoid hazards. • Distinguish between the various types of fire extinguishers. • Distinguish different types of alarms and their significance. • Differentiate the items available in the First aid box. • Discuss the significance of correct work posture and importance of ergonomics for the assigned job role. • Classify Personal Protective Equipment (PPEs) like body protectors, earplugs, nose masks, head caps, etc. as per guidelines. • Discuss the requirements for prescribed lighting at the weaving department.	• Classify abnormal sounds emanating from faulty/worn-out machine parts. • Demonstrate the process of handling of fire extinguishers. • Locate emergency exits of workplace and organization. • Demonstrate the method of fire drills and evacuation activities at the workplace. • Demonstrate the method of first aid procedures for injury/accidents in mock situations. • Demonstrate lifting of heavyweight materials as per the standard procedure.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
PPE, first aid kit, fire extinguishers, samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for shuttle loom (power/automatic, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable and hazardous wastes, video visuals on solar power, package and storage materials - covers, bags, wrappers, box, 2 shuttle loom (power/automatic) and 1 pirn winding machine in running	

production condition with minimum 25 empty pirns with 5Kg yarn, waist bag, waste samples, calculator, samples of operational tools, record books, firefighting equipment, medical emergency tool kit, seating arrangement for 25 people.

Module 11: Organizational standards and policies

Mapped to TSC/N9015, v1.0

Terminal Outcomes:

- Discuss the significance of organization policies, quality standards, rules, and regulations in textile industries.
- Discuss the requirements of maintaining hygienic working atmosphere as per the protocol of the textile sector.

Duration: *05:00*	**Duration: *10:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of following organizational standard procedures, quality standards, rules, codes, policies, and safety standards for the textile sector. • Discuss the need for organizational quality systems, 5S, ISO, SA, etc. following in the textile sector. • Brief the importance of following workwear standards, behavioural protocols, and etiquette in the textile sector. • Discuss the contents of the organization's formats and procedures for reporting production, defects, faults, material/tool requisition, and quality parameters and tasks completed for the assigned job. • Describe the do's and don'ts for maintaining equality among co-workers based on gender, caste, financial status, colour, race, PwD, etc.	• Demonstrate the process of practicing the systems like quality circles, 5S, ISO, etc. in the routine work. • Demonstrate the steps to maintain a hygienic workplace. • Demonstrate methods of registering complaints about discrimination based on gender, caste, financial status, colour, race, PwD, etc.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
list of rules and regulations followed in the organization, list of industry standards i.e., performance indicators of mills, process, worker, etc, reporting procedures and formats, standard operating procedures, quality standards, rules, codes, policies, safety standards, seating arrangement for 25 people.	

Module 12: Teamwork, trust and communication

Mapped to TSC/N9016, v1.0

Terminal Outcomes:

- Discuss the requirements of following standard guidelines while working with the team.
- Demonstrate the method of communication with others at the workplace.

Duration: *03:00*	**Duration: *07:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the importance of teamwork and following industry protocols at the workplace. • Explain the limits and responsibilities for the assigned duties in the textile sector. • Summarize emergency contact numbers, details of officials, reporting Protocols, and formats. • List hierarchy of communication and communication etiquettes in the textile sector.	• Demonstrate the method of executing allotted task with the team mates. • Illustrate the use of appropriate verbal and non-verbal communication skills while interacting with others at the workplace. • Demonstrate the process for reporting lost and found articles.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Video visuals of basic communications and team working, models of communicating, and the team at the assigned job, seating arrangement for 25 people.	

Module 13: Adaptability

Mapped to TSC/N9016, v1.0

Terminal Outcomes:

- Discuss the different hierarchy levels in the industry.
- Demonstrate the process of creating a work plan for the allotted task.

Duration: *02:00*	**Duration: *03:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of adaptability at the workplace with various levels of people. • State the importance of developing adaptability skills. • Explain the impacts of inadaptability at the workplace.	• Demonstrate the ability to work in a dynamic work environment by developing coping mechanisms, survival tactics, and traits of flexibility. • Demonstrate the preparation of the sample backup work plan for the shortage of manpower, raw materials, etc.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Video visuals of adaptability with suitable examples, seating arrangement for 25 people.	

Module 14: Weft replenishment in power loom

Mapped to TSC/N2220, v1.0

Terminal Outcomes:

- Demonstrate the process of stopping a power loom for weft replenishment.
- Demonstrate the process of carrying out reserve shuttle change and pirn change.

Duration: *06:00*	**Duration: *24:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the positing of loom for weft replenishment. • Discuss the steps involved in reserve shuttle and pirn change operation. • Discuss the procedure of weft yarn threading in the shuttle. • Calculate the total number of pirns required for the shift. • Discuss the significance of using multiple shuttles in the shuttle loom. • Discuss the potential hazards while handling the shuttles. • Discuss the types of shuttle with its dimensions, components and quality requirements. • Discuss the impacts of incorrect loading of shuttle in the shuttle box. • Discuss the impacts of incorrect placement of pirn in the shuttle.	• Demonstrate the procedure for stopping the power loom for weft replenishment at the required loom position. • Demonstrate the steps involved in refilling exhausted shuttle with full pirn as per SOP. • Demonstrate the steps for replacing the pirn in the shuttle. • Demonstrate the process of storing the empty pirn in the allotted bin. • Demonstrate the process of maintaining the shuttle.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for power loom, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable, and hazardous wastes, 2 power looms, waist bag, waste samples, calculator, samples of operational tools, record books, seating arrangement for 25 people, parts of shuttle loom (power loom/automatic loom) and pirn winding machine labelled, signboards, sample logbooks, and formats.	

Module 15: Prepare the weft replenishment device in an automatic shuttle loom

Mapped to TSC/N2221, v1.0

Terminal Outcomes:

- Demonstrate the preparation of auto weft replenishment device in the automatic shuttle looms.

Duration: *06:00*	**Duration: *24:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the steps involved in preparing the weft replenishment device in the automatic looms. • Describe the steps involved in arranging pirns in the magazine and shuttles in multiple shuttle box. • Discuss the components of the automatic pirn changing mechanism and their functions. • Explain the method for clearing of accumulation of extra weft in battery discs. • Discuss the importance of adjustment of picking stick and strap. • Describe the need for availability of the required reserve bunch. • Explain the arrangement of the weft pirn package as per design requirements. • Discuss threading of weft through thread holder. • Calculate the total number of pirns required for the shift. • Discuss the types of shuttle with its dimensions, components and quality requirements. • Discuss the impacts of incorrect loading of shuttle in the shuttle box. • Discuss the impacts of incorrect placement of pirn in the magazine.	• Demonstrate the method of arrangement of pirn in the magazine in the automatic shuttle looms. • Demonstrate the method of clearing accumulated dust from the weft feeler mechanism. • Demonstrate the method of threading the pirn automatic shuttle looms. • Prepare a schematic diagram of auto weft replenishment device.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and accessories for automatic loom, 2 full weaver's beam, 1 empty warp beam, 4 shuttles, 25 empty pirns, recyclable, non-recyclable, and hazardous wastes, 2 automatic looms, waist bag,	

waste samples, samples of operational tools, record books, seating arrangement for 25 people, parts of shuttle loom (power loom/automatic loom) and pirn winding machine labelled, signboards, sample logbooks, and formats.

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Basic literacy and numeracy	NA	1	Power loom/ Automatic shuttle loom with pirn winding machine	4	Power loom/ Automatic shuttle loom with pirn winding machine	

Trainer Certification	
Domain Certification	**Platform Certification**
TSC/Q2210, v1.0 Shuttle Loom Operator cum Pirn Winder (Power loom / Automatic shuttle loom), Minimum pass percentage 80 percent.	MEP/Q2601, v1.0 – Trainer, Minimum pass percentage 80 percent.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Textile	3	Weaving Production	-	-	

Assessor Certification	
Domain Certification	**Platform Certification**
TSC/Q2210, v1.0 - Shuttle Loom Operator cum Pirn Winder (Power loom/ Automatic shuttle loom), Minimum pass percentage 80 percent.	MEP/Q2701, v1.0 - Assessor, Minimum pass percentage 80 percent.

Assessment Strategy

The overall assessment strategy and specific arrangements have been put in place to ensure that assessment is always valid, reliable, and fair and show that these are in line with the requirements of the NSQF.

a) The emphasis is on 'learn-by-doing' and practical demonstration of skills and knowledge based on the performance criteria.

b) The assessment papers are developed by Subject Matter Experts (SME) available with the Assessment Agency as per the performances and assessment criteria mentioned in the Qualification Packs.

c) The assessment papers are also checked for the various outcome-based parameters such as quality, time taken, tools and equipment requirement, etc.

d) The assessments are designed to assess maximum parts during the practical hands-on work. Duties and responsibilities of Shuttle Loom Operator cum Pirn Winder (Power loom/ Automatic shuttle loom) also assessed. The technical limitations at the training centres are taken care of in theory and viva.

e) The assessment agencies are instructed to hire qualified and experienced assessors as per TSC's criteria who have integrity, reliability, and fairness. Each assessor shall sign a document with its assessment agency by which they commit themselves to comply with the rules of confidentiality and conflict of interest, independence from commercial and other interests that would compromise the impartiality of the assessments.

f) The assessment agencies are instructed to ideally have assessors with the right mix of industry experience; academia and these are detailed in the Assessment Agency Protocol of TSC

g) The assessors selected by Assessment Agencies are scrutinized and made to undergo training and introduction to Assessment Framework, competency-based assessments, assessors guide, etc. and they are assessed for Domain and assessment skills. Only those assessors who clear both the assessments with a minimum of 80% marks in each are permitted to carry out assessments.

h) The assessors are provided with an Assessors guide developed by the Subject Matter Expert of the Assessment Agency or by Textile SSC as per Assessment Framework. The Assessors guides are developed to ensure the maximum possible consistency/transparency in the assessment by different assessors and elaborate on the following:

1. Qualification Pack Structure
2. Guidance for the assessors to conduct theory, practical, and viva assessments
3. Guidance for trainees to be given by assessor before the start of the assessments
4. Guidance on the assessment process, practical brief with the step of operational practical observation checklist Attendance Sheet and mark sheet
5. Viva guidance for uniformity and consistency across the batch

6. Guidance on assessment evidence collection

The assessment results are backed by evidence collected by assessors.

1. The assessors need to collect a copy of the attendance sheets for the training done under the scheme. The attendance sheets are signed and stamped by the in-charge/ Head of the training centre.
2. The assessors need to verify the authenticity of the candidate by checking the photo ID card issued by the institute as well as anyone's Photo ID card issued by the Central/Government. The same needs to be mentioned in the attendance sheet. In case of suspicion, the assessor should authenticate and cross verify the trainee's credentials in the enrolment form.
3. The assessors need to take a camera to click the photograph of the trainees working on the job and giving theory exams as evidence.
4. The assessors also need to carry a Photo ID card.
5. The assessors also need to take the photographs as evidence from appropriate angles/sides of the final workpiece/job submitted by the trainee.
6. The details on the assessment framework are elaborated in the Textile SSC protocol for accreditation of Assessment Agencies and Assessment Framework.

All accredited Assessment Agencies follow the "Textile SSC's protocol for accreditation of Assessment Agencies and Assessment Framework". Each NOS in the Qualification Pack (QP) will be assigned a relative weightage for assessment based on the criticality of the NOS. Therein each Performances Criteria in the NOS will be assigned marks for theory or practical based on relative importance, the criticality of function, and training infrastructure.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do **upon the completion of the training**.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do **upon the completion of a module.** A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
SOP	Standard Operating Procedure
PPE	Personal Protective Equipment
ISO	International Organization for Standardization
SA	Standards on Auditing