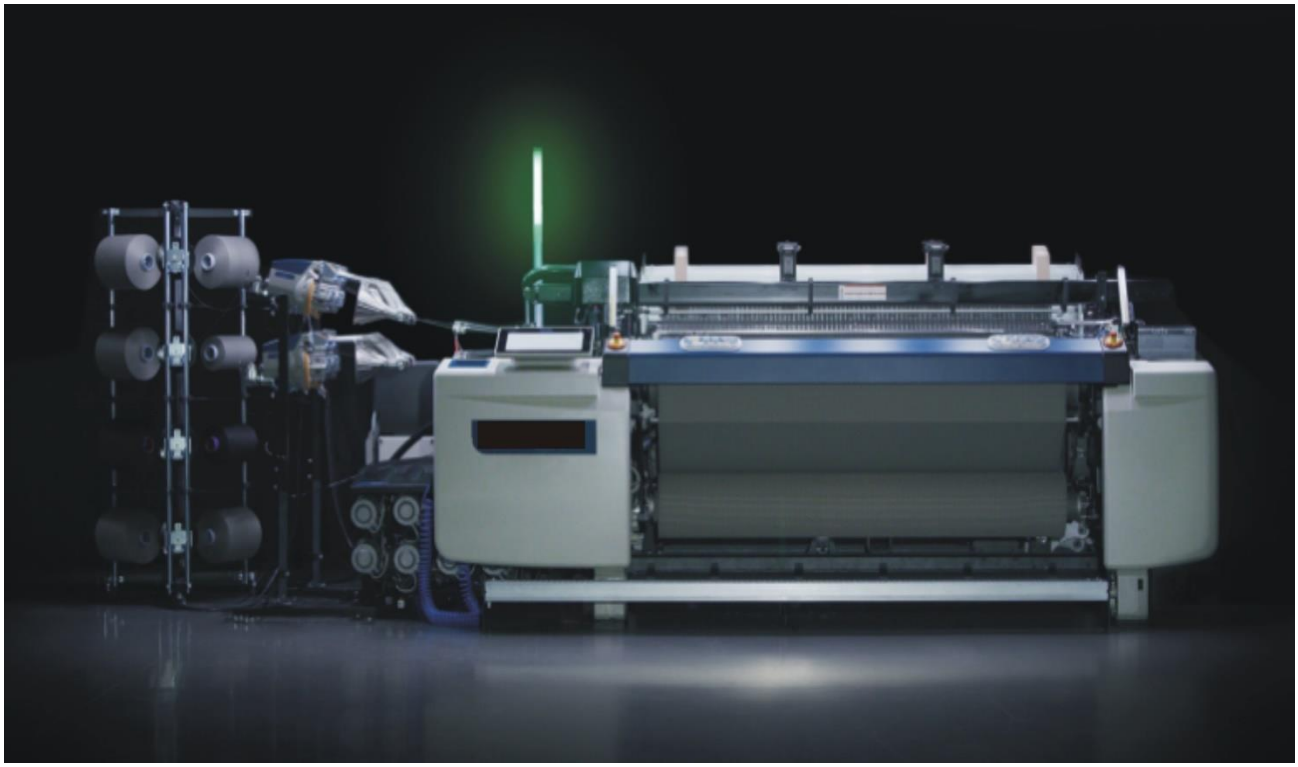

Model Curriculum

QP Name: Shuttleless Loom Operator

Electives: (Airjet Loom/ Rapier Loom/ Waterjet Loom/ Projectile Loom)

QP Code: TSC/Q2211

QP Version: 2.0

NSQF Level: 3

Model Curriculum Version: 1.0

Textile Sector Skill Council || Textile Sector Skill Council (TSC),14H, 14th Floor, Hansalaya Building, 15 Barakhamba Road, New Delhi-110001
Office: +91-11-43536355-7

Table of Contents

Training Parameters

Sector	Textile
Sub-Sector	Weaving-Textiles
Occupation	Weaving
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/8152.9900
Minimum Educational Qualification and Experience	• Grade 9 with No Experience (OR) • Grade 8 pass and pursuing continuous schooling in regular school with vocational subject with no experience (OR) • 8th grade pass with 1 year of relevant experience (OR) • 5th grade pass with 4 years of relevant experience (OR) • Ability to read and write with 5 years of experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	27.01.2022
Next Review Date	27.01.2025
NSQC Approval Date	
QP Version	2.0
Model Curriculum Creation Date	27.01.2022
Model Curriculum Valid Up to Date	27.01.2025
Model Curriculum Version	1.0
Minimum Duration of the Course	330 Hours
Maximum Duration of the Course	330 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 from and handover shift to shuttleless loom operator.
- Carry out loom operations in shuttleless loom.
- Mend warp and weft breaks while weaving on a shuttleless loom.
- Execute controls and settings in shuttleless loom operation.
- 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)
TSC/N2222 Taking charge of shift and handing over shift to operator – shuttleless loom NOS Version No. 1 NSQF Level 4	**15:00**	**15:00**			**30:00**
Module 2: Taking charge and handing over of shift to shuttleless loom operator	15:00	15:00			30:00
TSC/N2223Operate the shuttleless loom NOS Version No. 1 NSQF Level 4	**30:00**	**90:00**			**120:00**
Module 3: Operate the shuttleless loom	30:00	90:00			120:00
TSC/N9015 Follow machine, safety and organizational guidelines in textile sector NOS Version No. 1 NSQF Level 4	**25:00**	**50:00**	-	-	**75:00**

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 4: Maintaining the work area, tools and machines	02:00	08:00	-	-	10:00
Module 5: Greening and energy conservation in the textile sector	02:00	08:00	-	-	10:00
Module 6: Health, safety, and response to emergencies at the workplace	15:00	20:00	-	-	35:00
Module 7: Organizational standards and policies	06:00	14:00	-	-	20:00
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 8: Teamwork, trust, and communication	03:00	07:00			10:00
Module 9: Adaptability	02:00	03:00			05:00
DGT/VSQ/N0101 – Employability Skills Version 1.0 NSQF Level – 3	**12:00**	**18:00**	**-**	**-**	**30:00**
Module 10: Employability Skills	12:00	18:00	-	-	30:00
Total Duration	**87:00**	**183:00**			**270:00**

Elective Modules

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

Elective 1: Airjet 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/N2224Execute loom controls and settings – Airjet Loom NOS Version No. 1 NSQF Level 4	**15:00**	**45:00**			**60:00**

Module 11: Monitor and set loom controls in airjet loom	15:00	45:00			60:00
Total Duration	**15:00**	**45:00**			**60:00**

Elective 2: Rapier 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/N2225 Execute loom controls and settings – Rapier Loom NOS Version No. 1 NSQF Level 4	**15:00**	**45:00**			**60:00**
Module 12: Monitor and set loom controls in rapier loom	15:00	45:00			60:00
Total Duration	**15:00**	**45:00**			**60:00**

Elective 3: Waterjet 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/N2226 Execute loom controls and settings – Waterjet Loom NOS Version No. 1 NSQF Level 4	**15:00**	**45:00**			**60:00**
Module 13: Monitor and set loom controls in waterjet loom	15:00	45:00			60:00
Total Duration	**15:00**	**45:00**			**60:00**

Elective 4: Projectile 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/N2227 Execute loom controls and settings – Projectile Loom	**15:00**	**45:00**			**60:00**

NOS Version No. 1 NSQF Level 4					
Module 14: Monitor and set loom controls in projectile loom	15:00	45:00			60:00
Total Duration	**15:00**	**45:00**			**60:00**

Module Details

Module 1: Taking charge and handing over of shift to shuttleless loom operator

Mapped to TSC/N2222, 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: *15:00*	**Duration: *15:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of attending shift 10-15 minutes before the scheduled time. • Classify the operational tools required for yarn package checking and packing operation. • Describe the process of shift handover and shift takeover. • Describe shift checklist, shift log report, and its significance. • Discuss the quality requirements of packing materials, equipment such as packing fixer, strapping machine, weigh scale, pallet wrapper, trolley, HDPE sack, twine, needle, strap, carton box, carton pads, PE covers, disk, packing slip, cone label, etc. • Read a shift handover log report to understand the work to be done. • Discuss the need for exchanging production information with another packager cheker-cum-packer. • Describe the importance of patrolling the shuttleless loom shed. • Discuss protocol and formats for reporting any abnormalities. • Discuss the need for following the colour code in the weaving department. • Explain the significance of quality fabric production.	• Demonstrate the process of taking charge and handing over of the shift. • Prepare a sample production log report. • Demonstrate the process of taking supply and production stock. • Demonstrate the process of inspecting the condition of raw materials and tools at the production area and report the deviation as per standard protocol. • Demonstrate the method of collecting shift details from the previous shift operator by following SOP. • Demonstrate end of the shift activities like cleaning, disposal of waste, etc. • Demonstrate the process inspection of fabric defects caused by various factors such as machine, material, and atmospheric conditions, etc. • Choose different kinds of yarn based on the count and type of the yarn. • Illustrate the process flow in a typical shuttleless weaving process.

• Discuss the types of warp beam defects such as cross ends, missing ends, defective selvedges, etc. • Discuss the cleaning schedules followed in the weaving department. • Discuss the importance of technical details mentioned on the loom card or display board. • Explain the importance of waste collection and disposal as per the standard method. • Discuss the objectives of skill development programs. • Discuss the contribution of Indian textile and weaving sector to the country's economy. • Describe the basics of weaving by shuttleless loom i.e., process flow, fabric specification, material flow, type of yarn used, and different types of weaves. • 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 shuttleless loom operator. • List the rules and regulations followed in a weaving mill like shift timing and duration, limits of leave and holidays, etc. limited to the role of shuttleless loom operator.	
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 shuttleless loom (Airjet/ Rapier/ Waterjet/ Projectile) as per the elective chosen, weaver's beam, empty warp beam, shuttleless loom in running production condition, weft package, waist bag, waste samples, operational tools, record books, seating arrangement for 25 people, signboards, sample logbooks, and formats.	

Module 2: Operate the shuttleless loom

Mapped to TSC/N2223, v1.0

Terminal Outcomes:

- Demonstrate the process of operating the shuttleless loom.
- Explain the various parts and accessories used in the shuttleless loom operation.
- Demonstrate the process of rectifying the running woven fabric defects in the shuttleless loom.
- Demonstrate the process of monitoring and adjusting the shuttleless loom operations.

Duration: *30:00*	**Duration: *90:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss different types of shuttleless looms used for woven fabric production. • Discuss the weaving cycle of loom and the timings of primary, secondary and tertiary motions. • Discuss the available types of yarns and their weavability. • Classify fabric defects in the shuttleless loom operation caused due to warp, weft and loom faults. • Describe the various type of shedding mechanism in the shuttleless looms. • Discuss the tolerance limits of woven fabric parameters such as cloth width, Ends Per Inch (EPI), Picks Per Inch (PPI), etc. • Classify different woven fabric structures such as plain, satin, twill, jacquard, dobby designs, etc. • Discuss the standard repair time of various running fabric defects such as warp break, weft break, etc. • Explain the significance of maintaining the shuttleless loom department clean. • Discuss the common abnormalities in the shuttleless looms. • Discuss the significance of using prescribed thrumbs while mending the running warp defects. • Classify the various technical textile products. • Discuss the loom operating speed for various types of fabrics. • Differentiate between quick style change and quick warp change.	• Demonstrate the inching operation and fast running in the shuttleless loom. • Demonstrate the process of starting and stopping the shuttleless loom as per the standard procedure. • Demonstrate the process of adjustment of 'take-up' and 'let-off' functions in the allotted shuttleless loom. • Demonstrate the process of stopping the shuttleless loom using emergency stop button. • Demonstrate the process of monitoring the loom motions, knotting condition, weft availability and weft condition. • Demonstrate the process of rectifying wrong drawing, wrong denting, missing and double ends, etc. within the standard repair time. • Demonstrate the process of patrolling the allotted shuttleless looms for the quality check. • Demonstrate the method of cleaning the allotted shuttleless looms and doffing the cloth roll. • Demonstrate the method of identifying and repairing warp/ weft breakages as per the standard method. • Demonstrate the method of resetting the signal lamp after repairing the yarn break. • Demonstrate the method of drawing ends in the catch cord and selvedge area in the allotted loom. • Demonstrate the process of practising weavers' knot as per the prescribed method.

• Classify the various types of reeds used in shuttleless loom operation. • Discuss the available types of selvedges used in shuttleless loom operation. • Discuss the filling speed, filling settings, dropper types, etc. of the allotted shuttleless loom. • Differentiate between primary, secondary and tertiary motions of a shuttleless loom.	• Perform role play to assist the knotter at lot change and check knotting quality. • Demonstrate the method of unweaving the float as per SOP. • Demonstrate the method of monitoring the condition of the loom parts. • Demonstrate the process of inspecting the loom filling setting, back rest setting, filling cutter setting, pre-winder conditions, etc. • Demonstrate the process of adjusting the weft selectors, shed angle, loom rpm, take-up speed, etc. as per the instruction of the supervisor.
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 shuttleless loom (Airjet/ Rapier/ Waterjet/ Projectile) as per the elective chosen, weaver's beam, empty warp beam, shuttleless loom in running production condition, weft package, waist bag, waste samples, operational tools, record books, seating arrangement for 25 people, signboards, sample logbooks, and formats.	

Module 3: 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: *08:00***
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 shuttleless loom weaving. • 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 shuttleless looms. • Demonstrate the process of cleaning and maintain the shuttleless looms. • 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 shuttleless loom (Airjet/ Rapier/ Waterjet/ Projectile) as per the elective chosen, weaver's beam, empty warp beam, shuttleless loom in running production condition, weft package, waist bag, waste samples, operational tools, record books, seating arrangement for 25 people, signboards, sample logbooks, PPE Kits, and formats.	

Module 4: 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: *08:00***
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 shuttleless loom (Airjet/ Rapier/ Waterjet/ Projectile) as per the elective chosen, weaver's beam, empty warp beam, shuttleless loom in running production condition, weft package, waist bag, waste samples, operational tools, record books, seating arrangement for 25 people, signboards, sample logbooks, and formats.	

Module 5: 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: *15:00*	**Duration: *20:00***
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	
Samples of yarns, woven and finished fabrics, process flow chart of weaving department, sample tools, and shuttleless loom (Airjet/ Rapier/ Waterjet/ Projectile) as per the elective chosen, weaver's beam, empty warp beam, shuttleless loom in running production condition, weft package, waist bag, waste samples, operational tools, record books, seating arrangement for 25 people, signboards, sample logbooks, and formats.	

Module 6: 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: *06:00*	**Duration: *14:00***
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 7: 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 teammates. • 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 8: 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 9: Employability Skills

Mapped to DGT/VSQ/N0101, v1.0

Duration: *12:00*	**Duration: *18:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the importance of Employability Skills in meeting the job requirements. • Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. • Discuss 21st century skills. • Use appropriate basic English sentences/phrases while speaking • Show how to conduct oneself appropriately with all genders and PwD • Discuss the significance of reporting sexual harassment issues in time • Discuss the significance of using financial products and services safely and securely. • Explain the importance of managing expenses, income, and savings. • Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws • Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely. • Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges. • Differentiate between types of customers • Explain the significance of identifying customer needs and addressing them • Discuss the significance of maintaining hygiene and dressing appropriately. • Discuss the significance of dressing up neatly and maintaining hygiene for an interview • Discuss how to search and register for apprenticeship opportunities.	• Show how to practice different environmentally sustainable practices • Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations. • Demonstrate how to communicate in a well -mannered way with others. • Demonstrate working with others in a team • Show how to operate digital devices and use the associated applications and features, safely and securely • Create a biodata • Use various sources to search and apply for jobs
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment and Other Requirements	
Class room requirements: 25 people seating capacity with a screen and projector	

Module 10: Monitor and set loom controls in airjet loom

Mapped to TSC/N2224, v1.0

Terminal Outcomes:

- Demonstrate the process of monitoring and setting the controls of the airjet loom.

Duration: *15:00*	**Duration: *45:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the parts and their functions in the airjet loom. • Discuss the weft insertion mechanism in the airjet loom. • Explain the airjet loom timing diagram. • Discuss the optimum air pressure range for main and relay nozzles. • Explain the functions of the profile reed used in airjet loom operation. • Discuss the potential hazards associated with airjet loom operation. • Discuss the operating speed and functional width of the allocated airjet loom.	• Demonstrate the process of monitoring the functions of the airjet loom. • Demonstrate the steps involved in setting the air pressure in main and relay nozzles as per SOP. • Demonstrate the steps involved in testing the main and relay nozzles. • Demonstrate the process of setting the weft selector as per the weft design requirement. • Demonstrate the steps involved in assembling the relay nozzles. • Demonstrate the method of dismantling and assembling the leno selvedge mechanism.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Airjet loom in running production condition, warp beams, weft package, maintenance tool and accessories.	

Module 11: Monitor and set loom controls in rapier loom

Mapped to TSC/N2225, v1.0

Terminal Outcomes:

- Demonstrate the process of monitoring and setting the controls of the rapier loom.

Duration: *15:00*	**Duration: *45:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the parts and their functions in the rapier loom. • Discuss the weft insertion mechanism in the rapier loom. • Explain the rapier loom timing diagram. • Discuss the various types of rapier looms available for woven fabric production. • Explain the functions of the grippers, rapier tape, etc. used in rapier loom operation. • Discuss the potential hazards associated with rapier loom operation. • Discuss the operating speed and functional width of the allocated rapier loom.	• Demonstrate the process of monitoring the weft insertion of rapier loom. • Demonstrate the steps involved in setting grippers, rapier tape, sprocket, etc. as per SOP. • Demonstrate the procedure for handling the rapier tape and grippers. • Demonstrate the process of setting the filling yarn cutter as per the fabric width requirement. • Demonstrate the steps involved in threading the weft yarn from pre-winder to gripper. • Demonstrate the method of dismantling and assembling rapier tape, gripper and sprocket.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Rapier loom in running production condition, warp beams, weft package, maintenance tool and accessories.	

Module 12: Monitor and set loom controls in waterjet loom

Mapped to TSC/N2226, v1.0

Terminal Outcomes:

- Demonstrate the process of monitoring and setting the controls of the waterjet loom.

Duration: *15:00*	**Duration: *45:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the parts and their functions in the waterjet loom. • Discuss the weft insertion mechanism in the waterjet loom. • Explain the waterjet loom timing diagram. • Discuss the optimum jet pressure range for main and relay nozzles. • Discuss the quality requirement of water used for waterjet weaving. • Discuss the various types of filaments that can be used in waterjet weaving method. • Explain the functions of the reed used in waterjet loom operation. • Discuss the potential hazards associated with waterjet loom operation. • Discuss the operating speed and functional width of the allocated waterjet loom.	• Demonstrate the process of monitoring the functions of the waterjet loom. • Demonstrate the steps involved in setting the jet pressure in main and relay nozzles as per SOP. • Demonstrate the steps involved in testing the main and relay nozzles. • Demonstrate the steps involved in assembling the relay nozzles. • Demonstrate the method of dismantling and assembling the selvedge mechanism.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Waterjet loom in running production condition, warp beams, weft package, maintenance tool and accessories.	

Module 13: Monitor and set loom controls in projectile loom

Mapped to TSC/N2227, v1.0

Terminal Outcomes:

- Demonstrate the process of monitoring and setting the controls of the projectile loom.

Duration: *15:00*	**Duration: *45:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the parts and their functions in the projectile loom. • Discuss the weft insertion mechanism in the projectile loom. • Explain the projectile loom timing diagram. • Discuss the projectile types, dimensions and configuration. • Explain the methods of handling projectiles as per the standard method. • Discuss the advantages of projectile over other shuttleless looms. • Explain the machine and fabric faults specific to projectile and their repairing methods. • Discuss the potential hazards associated with projectile loom operation. • Discuss the operating speed and functional width of the allocated projectile loom.	• Demonstrate the process of monitoring the functions of the projectile loom. • Demonstrate the steps involved in setting the projectile picking force as per SOP. • Demonstrate the steps involved in loading the projectiles in the picking position as per SOP. • Demonstrate the process of rethreading the projectile for weft break as per SOP. • Demonstrate the method of dismantling and assembling tuck-in selvedge mechanism.
Classroom Aids:	
Charts, Posters, Projector, Blackboard.	
Tools, Equipment, and Other Requirements	
Projectile loom in running production condition, warp beams, weft package, maintenance tool and accessories.	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Basic literacy and numeracy	5th Class (Self declaration)	1	Shuttleless loom Weaving Production	4	Shuttleless loom	-

Trainer Certification	
Domain Certification	**Platform Certification**
TSC/Q2211, v1.0 Shuttleless Loom Operator (Airjet Loom/ Rapier Loom/ Waterjet Loom/ Projectile Loom), Minimum pass percentage 80 percent.	MEP/Q2601, v1.0 – Trainer, Minimum pass percentage 80 percent.

Employability Trainer Prerequisites

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	**Specialization**	**Years**	**Specialization**	
Graduate/CITS	Any Discipline			2	Teaching Experience	Prospective ES trainer should: • have good communication skills • be well versed in English • have digital skills • have attention to detail • be adaptable • have willingness to learn
Current ITI Trainers	Employability Skills Training (3 days full-time course done between 2019-2022)					
Certified current EEE trainers (155 hours)	from Management SSC (MEPSC)					
Certified Trainer	Qualification Pack: Trainer (MEP/Q0102)					

Assessor Requirements

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

Assessor Certification	
Domain Certification	**Platform Certification**
TSC/Q2211, v1.0 Shuttleless Loom Operator (Airjet Loom/ Rapier Loom/ Waterjet Loom/ Projectile 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 Shuttleless Loom Operator 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
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).
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
PPE	Personal Protective Equipment
EPI	Ends Per Inch
PPI	Picks Per Inch
GSM	Grams per Square Meter
RPM	Revolutions Per Minute