GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

COMPETENCY BASED CURRICULUM

WEAVING TECHNICIAN

(Duration: Two Years)
Revised in July 2022

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4

SECTOR – TEXTILE AND HANDLOOM

Directorate General of Training

WEAVING TECHNICIAN

(Engineering Trade)

(Revised in July 2022)

Version: 2.0

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 4

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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1. COURSE INFORMATION

During the two-year duration of Weaving Technician trade, a candidate is trained on Professional Skill, Professional Knowledge, Engineering Drawing, Workshop Calculation & Science and Employability Skills related to job role. In addition to this, a candidate is entrusted to undertake project work and extracurricular activities to build up confidence. The broad components covered under Professional Skill subject are as below:

FIRST YEAR: In this year the candidates will acquire the skill on identifying various types of hand tools, observed the safety precautions during filing, marking, punching and drilling practices. They will also aware of various types' gauges, types of lathes and its functions. Turning tool grinding, tool setting and job setting, facing and chamfering, plain turning etc. They will also developed skill on various types of welding and welding process. He will apply range of skill to execute different carpentry work. They will also identify different electrical and electronic measuring instruments and test electrical assembly. Trainees will Identify types of operation, test different textile machineries used in textile industries with the raw materials, They are able to Perform various Weaving preparatory processes using Important machine settings, adjustments; material flow, Calculating Production, Efficiency, important parameters of various machines and their Maintenance.Trainees will able to Identify different types of Sizing machines, their parts, functions and their maintenance schedule & apply sizing ingredients, formulation of recipe for cotton yarn, Determine Sizing Cost and check Production and Efficiency of sizing machine.

SECOND YEAR– During this year trainees will Identify types of reed & heald wire and their use, Prepare Point Paper for basic and modified weave types with design, draft & peg plan, Check Quality parameters of defective yarn samples, End break study in looms. They will also identify various weaving loom, their classification and Perform primary, secondary & auxiliary motion of loom using weaving machines. Trainees will able to Calculate loom constant, Production and efficiency Timing Diagram, Fabric quality parameters. They can Identify &check the functions of dobby and execute the operation of Jacquard loom. Trainees will analyze and operate drop box loom. They will able to identify different path and functions, types of Projectile loom, Rapier loom, Air-jet loom and operate the same. Trainees will also identify & apply QA system in textile industry.

2. TRAINING SYSTEM

2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of Labour market. The vocational training programmes are running under aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer programmes under DGT for propagating vocational training.

The Weaving Technician trade under CTS is one of the popular newly designed courses delivered nationwide through a network of ITIs. The course is of two years duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while Core area (Workshop Calculation Science, Engineering Drawing and Employability Skills) impart requisite core skill, knowledge and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized worldwide.

Trainee broadly needs to demonstrate that they are able to:

- Read & interpret technical parameters/documentation, plan and organize work processes, identify necessary materials and tools;
- Perform tasks with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional knowledge, core skills & employability skills while performing the job, and repair & maintenance work.
- Check the job with circuit diagrams/components as per drawing for functioning, diagnose and rectify faults in the components/module.
- Document the technical parameters in tabulation sheet related to the task undertaken.

2.2 PROGRESSION PATHWAYS:

- Can join industry as Weaving Technician and will progress further as Senior Technician, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can take admission in the diploma course in notified branches of Engineering by lateral entry.

- Can join Apprenticeship programs in different types of industries leading to a National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming an instructor in ITIs.
- Can join Advanced Diploma (Vocational) courses under DGT as applicable.

2.3 COURSE STRUCTURE:

Table below depicts the distribution of training hours across various course elements during a period of two-years: -

S No.	Course Element	Notional Training Hours	
		1st Year	2nd Year
1	Professional Skill (Trade Practical)	840	840
2	Professional Knowledge (Trade Theory)	240	300
5	Employability Skills	120	60
	Total	**1200**	**1200**

Every year 150 hours of mandatory OJT (On the Job Training) at nearby industry, wherever not available then group project is mandatory.

4	On the Job Training (OJT)/ Group Project	150	150

Trainees of one-year or two-year trade can also opt for optional courses of up to 240 hours in each year for 10th/ 12th class certificate along with ITI certification, or, add on short term courses.

2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The Continuous Assessment (Internal) during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute has to maintain individual *trainee portfolio* as detailed in assessment guideline. The marks of internal assessment will be as per the formative assessment template provided on www.bharatskills.gov.in.

b) The final assessment will be in the form of summative assessment. The All India Trade Test for awarding NTC will be conducted by Controller of examinations, DGT as per the guidelines. The pattern and marking structure is being notified by DGT from time to time. **The learning outcome and assessment criteria will be basis for setting question papers for final assessment. The examiner during final examination will also check** individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS REGULATION

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%.

2.4.2 ASSESSMENT GUIDELINE

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards OSHE and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising some of the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work
- Computer based multiple choice question examination
- Practical Examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:

Performance Level	Evidence
(a) Marks in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices	• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment. • 60-70% accuracy achieved while undertaking different work with those demanded by the component/job. • A fairly good level of neatness and consistency in the finish. • Occasional support in completing the project/job.
(b) Marks in the range of 75%-90% to be allotted during assessment	
For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices	• Good skill levels in the use of hand tools, machine tools and workshop equipment. • 70-80% accuracy achieved while undertaking different work with those demanded by the component/job. • A good level of neatness and consistency in the finish. • Little support in completing the project/job.
(c) Marks in the range of more than 90% to be allotted during assessment	
For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.	• High skill levels in the use of hand tools, machine tools and workshop equipment. • Above 80% accuracy achieved while undertaking different work with those demanded by the component/job. • A high level of neatness and consistency in the finish. • Minimal or no support in completing the project.

3. JOB ROLE

Weaving Master; organizes, controls and supervises weaving of clothes, calendaring and process preparatory to weaving such as winding, warping, sizing, etc. Instructs Jobbers for proper winding, warping and sizing of yarn. Ensures that required degree of temperature and humidity in various weaving sections is maintained. Visits sections periodically and supervises work of men in charge. Ensures that quality of cloth produced conforms to prescribed standard and suggests alterations and improvements wherever necessary. Gets machines repaired or replaced as necessary for restoration of work. Maintains quality and quantity of production and keeps machines, looms and equipment in good working order. Controls staff and maintains discipline. May introduce new methods and devices to improve quality of cloth. May conduct research for better methods of production.

Weaver, Handloom; weaves cloth from yarn on handloom. Mounts warp beam on loom. Sets healed frame in position. Draws ends of warp yarn from beam through comb and fastens them together to cloth winding roll. Places full bobbins of weft yarn in shuttle. Operates loom by pressing and relieving two foot levers alternately to raise and lower heald, simultaneously pulling string with jerk with one hand so as to throw shuttle across warp yarn from side to side and by moving comb forward and backward with other hand to properly fill weft yarn. Draws broken ends of yarn through healed and comb and knots them. Replaces empty bobbins in shuttles. Removes cloth from roll when required length has been woven. May size and dye yarn, wind yarn on bobbins or beam and draw ends of yarn from warp beam through healds preparatory to weaving.

Weaver Power Loom; operates and tends power loom to weave cloth, checks that shuttles are in position and supplied with full weft bobbins, no wrap yarn is broken and that set-up is ready. Starts loom. Watches looms under his charge for defects in weaving. Locates broken ends of warp yarn, ties short length of yarn to broken end from warp beam, draws end through drop wire and reeds using reed hook, ties it to other end with a weaver's knot, and starts loom again. Cuts and pulls out filling of weft yarn up to point of defect, adjusts and starts loom. Replaces empty bobbin in shuttles. Cuts cloth when cloth roll becomes full.

Card Cutter; Punch Operator (Textile) operates card cutting machine for punching holes in card used for controlling pattern of cloth woven on jacquard or dobby looms. Studies designs. Spreads graph paper on table and prepares draft and plan for design, indicating places where warp is to be raised over weft. Fixes graph paper containing design on machine board. Inserts plan card into cutting machine equipped with key-board. Depresses key with fingers to punch holes into card as per diagram for controlling pattern on cloth woven. Presses lever by leg to push punched card into inner portion of machine making room for punching unpunched portion. Numbers punched cards serially and inserts them in pegs in stand for subsequent lacing. Fixes and adjusts heald and card chain on jacquard machine. May prepare design for

lattice pegging. May do lacing of cards by hand or machine to make complete design. May do lattice pegging. May fix up heald and lattice on dobby loom.

Reference NCO-2015:

(i) 2141.1500 – Weaving Master
(ii) 7318.5800 – Weaver, Handloom
(iii) 7318.5500 – Weaver Power Loom
(iv) 8152.0400 – Card Cutter

Reference NOS: - (i)TSC/N9015,
(ii)TSC/N9407,
(iii)TSC/N2402,
(iv)TSC/N2107,
(v)TSC/N2105,
(vi)TSC/N9401,
(vii)TSC/N2218,
(viii) TSC/N9408,
(ix)TSC/N2223,
(x)TSC/N2225
(xi)TSC/N7308,
(xii)TSC/N7309,
(xiii) TSC/N2227,
(xiv)TSC/N2224

4. GENERAL INFORMATION

Name of the Trade	**WEAVING TECHNICIAN**
Trade Code	DGT/1101
NCO - 2015	2141.1500, 7318.5800, 7318.5500, 8152.0400
NOS Covered	TSC/N9015, TSC/N9407, TSC/N2402, TSC/N2107, TSC/N2105, TSC/N9401, TSC/N2218, TSC/N9408, TSC/N2223, TSC/N2225 TSC/N7308, TSC/N7309, TSC/N2227, TSC/N2224
NSQF Level	Level-4
Duration of Craftsmen Training	Two Years (2400 hours + 300 hours OJT/Group Project)
Entry Qualification	Passed 10th class examination
Minimum Age	14 years as on first day of academic session.
Eligibility for PwD	LD,CP,LC,DW,AA,LV,DEAF,HH,AUTISM,ID,SLD
Unit Strength (No. Of Students)	24 (There is no separate provision of supernumerary seats)
Space Norms	525 Sq. m
Power Norms	9.4 KW
Instructors Qualification for:	
1. Weaving Technician Trade	B.Voc/Degree in Textile Technology from AICTE/UGC recognized university/ college with one year experience in relevant field. **OR** 03 years Diploma in Textile Technology from AICTE recognized board of education/ Institute or relevant Advanced Diploma (Vocational) from

	DGT with two years experience in the relevant field. **OR** NTC/NAC passed in the Trade of "Weaving Technician" with three years experience in the relevant field. **Essential Qualification:** Relevant Regular / RPL variants of National Craft Instructor Certificate (NCIC) under DGT. ***NOTE:- Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications. However both of them must possess NCIC in any of its variants.***
2. Workshop Calculation & Science	B.Voc/Degree in Engineering from AICTE/UGC recognized Engineering College/ university with one-year experience in the relevant field. **OR** 03 years Diploma in Engineering from AICTE / recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field. **OR** NTC/ NAC in any one of the engineering trades with three years' experience. **Essential Qualification:** Regular / RPL variants of National Craft Instructor Certificate (NCIC) in relevant trade **OR** Regular / RPL variants NCIC in RoDA or any of its variants under DGT
3. Engineering Drawing	B.Voc/Degree in Engineering from AICTE/UGC recognized Engineering College/ university with one-year experience in the relevant field. **OR** 03 years Diploma in Engineering from AICTE / recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with two years' experience in the relevant field. **OR** NTC/ NAC in any one of the Mechanical group (Gr-I) trades categorized under Engg. Drawing'/ D'man Mechanical / D'man Civil' with three years' experience. **Essential Qualification:** Regular / RPL variants of National Craft Instructor Certificate (NCIC) in relevant trade **OR** Regular / RPL variants of NCIC in RoDA / D'man (Mech /civil) or any of

	its variants under DGT.
4. Employability Skill	MBA/ BBA / Any Graduate/ Diploma in any discipline with Two years' experience with short term ToT Course in Employability Skills (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above) **OR** Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills
5. Minimum Age for Instructor	21 Years
List of Tools and Equipment	As per Annexure – I

5. LEARNING OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

5.1 LEARNING OUTCOMES

FIRST YEAR:

1. Plan and organize the work to make job as per specification applying different types of basic fitting operations and Check for dimensional accuracy following safety precaution. *[Basic fitting operations – marking, Hack-sawing, punching, Chiselling, Filing, Drilling, Grinding and job setting]* TSC/N9015
2. Plan and organize the work to make job on facing, chamfering, plain Turing, taper turning and simple thread. TSC/N9015
3. Plan and identify different types of skill related to sheet metal work and on various types of welding practices like square butt joint, single V butt joint, arc welding and gas welding. TSC/N9015
4. Apply a range of skill to execute different carpentry work. TSC/N9015
5. Plan, identify and test on electrical /electronic measuring instruments. TSC/N9015
6. Identify types of operation, test different textile machineries used in industries with the raw materials. TSC/N9407
7. Perform various weaving preparatory processes using Important machine settings, adjustments; material flow, calculating production, efficiency, important parameters of various machines and their Maintenance. TSC/N2402

8. Identify different types of sizing machines, their parts, functions and their maintenance schedule. TSC/N2107
9. Identify & apply sizing ingredients, formulation of recipe for cotton yarn, determine sizing cost and check production and efficiency of sizing machine. *TSC/N2105*
10. Read and apply engineering drawing for different application in the field of work TSC/N9401
11. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study TSC/N9402

SECOND YEAR

12. Identify types of reed & heald wire and their use. TSC/N2218
13. Prepare Point Paper for basic and modified weave types with design, draft & peg plan. TSC/N2218
14. Check Quality parameters of defective yarn samples, End break study in looms. TSC/N2218
15. Identify various weaving loom, their classification and Perform primary, secondary & auxiliary motion of loom using weaving machines. TSC/N2218
16. Calculate loom constant, Production and efficiency Timing Diagram, Fabric quality parameters. TSC/N9408
17. Identify, check the functions of dobby. TSC/N2218
18. Identify, execute the operation of Jacquard loom. TSC/N7308, TSC/N7309
19. Analyze and operate drop box loom. TSC/N2218
20. Identify different path and functions, types of Projectile loom and operate the same. TSC/N2223, TSC/N2227
21. Identify different path and functions, types of Rapier loom and operate the same. TSC/N2223, TSC/N2225
22. Identify different path and functions, types of Air-jet loom and operate the same. TSC/N2223, TSC/N2224
23. Identify & apply QA system in textile industry. TSC/N9015
24. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study TSC/N9402

6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
FIRST YEAR	
1. Plan and organize the work to make job as per specification applying different types of basic fitting operations and Check for dimensional accuracy following safety precaution. [Basic fitting operations – marking, Hack-sawing, punching, Chiselling, Filing, Drilling, Grinding and job setting]	Observe the safety precautions during filing, marking and punching, internal fitting and drilling practice.
	Identify the type of hand tools, care and maintenance during various practices.
	Identify the cutting and measuring tools used for filing, marking and punching practice.
	Identify the types and specifications of drills, cutting angles, tap drills and dies used for internal fitting and drilling.
	Identify the geometrical construction of various types of grinding machine.
	Identify the various types of gauges, uses, care and maintenance.

TSC/N9015	Identify the types of lathes , parts and its functions of lathe machinery.
	Identify the specification and different accessories of lathe machinery.
2. Plan and organize the work to make job on facing, chamfering, plain Turing, taper turning and simple thread. TSC/N9015	Select the different types of operations performed in lathe.
	Identify the cutting tool materials, types and selection of cutting angles.
	Select the uses and applications of various types of cutting angles.
	Identify the different types of threads and its application for tapping and dyeing process.
3. Plan and identify different types of skill related to sheet metal work and on various types of welding practices like square butt joint, single V butt joint, arc welding and gas welding. TSC/N9015	Identify the various types of hand tools, marking and cutting tools used for sheet metal work.
	Identify soft and hard soldering operations used in sheet metal joint.
	Identify the types of sheets used for folding, notching, wiring and hemming operations.
	Identify the allowances and uses of sheets for folding, notching, wiring and hemming operations.
	Identify the tools, equipments and types of welding joints.
	Identify the various types of welding practices, electrodes and current selection for the welding process.
	Observe the specifications and safety precautions during welding practice.
	Observe the type of gases, pressure and nozzle selection used in gas welding.
	Perform the edge preparation for arc and gas welding process.
4. Apply a range of skill to execute different carpentry work. TSC/N9015	Identify the hand and measuring tools, work holding devices used in carpentry.
	Identify the types of clamps, sizes and its uses in carpentry.
	Identify the plan and setting parameters for sharpening.
	Identify the different types of saws, setting parameters and its uses in carpentry.
	Familiar on specifications and uses of wood working machine.
	Identify adhesive types and identify its uses in carpentry.

5. Plan, identify and test on electrical /electronic measuring instruments. TSC/N9015	Select the different electrical measuring instrument.
	Identify the instruments used for testing.
	Identify the fundamental terms of work power, energy, units, voltage, current resistance, and colour codes.
	Identify the types of cables, standard wire gauge, ohm's law and Kirchoffs law.
	Identify the concepts of series and parallel connection.
	Identify the properties of conductor, semi-conductor and insulator.
	Identify the primary and secondary cells, common electrical accessories and their specification.
	Demonstrate the functioning of domestic appliances.
	Measure and record the data by using the testing instrument like ammeter, voltmeter and multimeter of AC and DC.
6. Identify types of operation, test different textile machineries used in industries with the raw materials. TSC/N9407	Know the process sequence of yarn manufacture and intermediate products
	Know the importance of textile industry and its contribution to Indian economy
	Classify textile fibres based on origin
	Identify textile fibres with respect to test
	Determine the yarn properties – count, twist, CSP, strength and unevenness, CV%
7. Perform various Weaving preparatory processes using Important machine settings, adjustments; material flow, Calculating Production, Efficiency, important parameters of various machines and their Maintenance. TSC/N2402	Know the objectives of winding, warping process and pirn winding process.
	Differentiate packages from various operations LIKE direct / indirect warping and beam / sectional warping
	Classify pirns with respect to loom / shuttle types
	Determine warp beam &pirn parameters
	Draw the gearing diagram of various machines and determine their production data.
	Draw the gearing diagram of winding machine and determine production data.
	Determine wound package parameters – length, weight, diameter, etc.
	Learn the types of knot and splices

	Understand the features of modern automatic winders.
	Know the wound package faults, causes and remedial measures.
	Establish accurate settings on winding machine based on yarn count and norms.
	Learn the types of creel and stop motions.
	Understand the features of modern warpers.
	Know the warp beam faults, causes and remedial measures.
	Know the unique processes related to sectional warping – leasing, pattern formation, section parameters determination, number of sections, etc.
	Establish accurate settings on warping machine based on yarn count and norms.
	Learn the types of tensioners and stop motions.
	Know the features of modern pirn winders.
	Know the pirn package faults, causes, remedial
	Measures and pirn stripping process.
	Know the pirn traverse, builder mechanism.
	Establish accurate settings on pirn winder based on yarn count and norms.
8. Identify different types of Sizing machines, their parts, functions and their maintenance schedule. TSC/N2107	Know the objectives of sizing process
	Classify sizing machines with respect to drying arrangement.
	Draw the material passage diagram of sizing machine.
	Learn the types of creel arrangement, size box, drying systems and yarn splitting.
	Know the features of modern sizing machines.
	Know the Speed regulation process – PIV and Variator.
	Establish the settings on sizing machine based on yarn count and norms.
	Know various controls – temperature, level, moisture and stretch.
	Know the marking and length measuring process and operation of safety valves.
9. Identify & apply sizing ingredients, formulation of recipefor cotton yarn,	Determine sizing machine parameters – Size concentration, Add-on and Percentage.
	Know the cost of sizing

Determine Sizing Cost and check Production and Efficiency of sizing machine. TSC/N2105	Learn the various size ingredients and recipe formulation for various yarn types.
	Know the size mixing and cooking process.
	Know the single end sizing
	Know the sized beam defects, causes, remedial measures.
	Determine the production and efficiency of sizing machine.
10. Read and apply engineering drawing for different application in the field of work TSC/N9401	Read & interpret the information on drawings and apply in executing practical work.
	Read &analyze the specification to ascertain the material requirement, tools and assembly/maintenance parameters.
	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/ parameters to carry out the work.
11. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study TSC/N9401	Solve different mathematical problems
	Explain concept of basic science related to the field of study
SECOND YEAR	
12. Identify types of reed &heald wire and their use. TSC/N2218	Know the types of reed and heald wire.
	Determine reed count and heald count in various methods.
	Calculate dent spacing of reed
	Know the types of drawing-in and tyeing machines
	Know the drawing-in ,pinning and denting procedure for various weave pattern
	Know the beam gaiting sequence of various weave types on the loom
13. Prepare Point Paper for basic and modified weave types with design, draft & peg plan. TSC/N2218	Know the draw the weave representation in point paper.
	Know the preparation of design, draft and peg plan in point paper for fundamental weave patterns – Plain, twill, satin, sateen.
	Know the preparation of design, draft and peg plan in point

	paper for modified weave patterns – Rib weaves, twill derivatives, crepe, honey comb, huck-a-back, Bedford cord, mock leno, etc.
14. Check Quality parameters of defective yarn samples, End break study in looms. TSC/N2218	Know the yarn quality requirements of both warp and weft for shuttle and shuttleless looms.
	Know the various yarn defects and remedial measures.
	Carry out end breakage study in looms.
15. Identify various weaving loom, their classification and Perform primary, secondary & auxiliary motion of loom using weaving machines. TSC/N2218	Know the principles of fabric formation.
	Classify looms based on level of operation /technology.
	Distinguish merits/demerits of auto and non-auto looms.
	Know the salient features of shuttleless looms.
	Know the principles of shedding, picking and beat-up motions.
	Trace the material passage through loom and identify various parts.
	Draw the gearing diagram of drive and determine speed of loom shafts – crank, bottom and tappet shafts.
	Establish settings related to tappet shedding – shed depth; change tappets according to weave patterns.
	Establish settings of picking – timing /force adjustment.
	Establish settings of beat-up – sley eccentricity setting.
	Know the difference between positive and negative shedding
	Know the difference between over and under picking.
	Know the principle of negative and positive let-off mechanisms
	Know the mechanism of adjusting the settings
	know to control the warp tension
	Know to adjust the parts for changing the settings
	Know the settings of backrest, stop motions, feelers, pirn transfer.
	Know the mechanism of shuttle protection – fast reed and loose reed.
	Know the mechanism and settings of pirn changing mechanism.
16. Calculate loom constant, Production and efficiency Timing Diagram, Fabric quality parameters.	Draw the loom timing diagram of various looms.
	Calculate loom constant
	Determine the production rate of looms and its efficiency.
	Know the various fabric quality parameters – EPI, PPI, GSM, etc.

TSC/N9408	
17. Identify, check the functions of dobby. TSC/N2218	Know the principles of dobby, its types and classification.
	Trace the material passage through dobby loom and identify various parts.
	Know the dobby pegging sequence according to weave plan.
	Carry out the mounting of wooden lattice with pegs depending on dobby type – LH or RH.
	Know the technique of pick finding.
	Awareness to electronic dobby and cross border dobby.
	Know the working of paper dobby.
	Carry out maintenance and lubrication in dobby looms.
18. Identify, execute the operation of Jacquard loom. TSC/N7308, TSC/N7309	Know the principles of jacquard, its types and classification.
	Trace the material passage through jacquard loom and identify various parts.
	Preparation of the point paper depending on weave design.
	Carry out card punching according to point paper design
	Load the laced cards on the jacquard depending on single / double cylinder jacquard.
	Know the process of casting out in jacquard.
	Connection of harness to hook and lingoes.
	Awareness to electronic and fine pitch jacquards.
	Carry out maintenance and lubrication in jacquard looms.
	Establish settings on picking force, shuttle box, alignment, reed alignment, race board alignment.
19. Analyze and operate drop box loom. TSC/N2218	Know the objectives of drop box, its types and classification – 1x2, 1x4, 4x4 types.
	Identify various parts in a drop box loom.
	Know then procedure to draw weft patterns for the given style.
	Arrange the shuttles in drop box according to color order in the weft pattern.
	Carry out lattice pegging according to color and lift sequence.
	Know the safety and card saving devices in drop box loom.
	Carry out maintenance and lubrication in drop box looms.
	Know the change in loom settings of various motions to carry out blends/synthetic weaving.

	Know the defects, its causes and remedial measures common to blends/synthetic fabric weaving.
20. Identify different path and functions, types of Projectile loom and operate the same. TSC/N2223, TSC/N2227	Know the principle of operation of projectile looms.
	Identify the parts and functions of projectile looms.
	Know the settings of torsion bar picking mechanism and the weft insertion cycle.
	Know the settings of cam arrangement, shed geometry, weft accumulator, stop motion, take-up, let-off, sley drive.
	Modify / alter data in the control panel according to weave style and other electronic features.
	Carry out maintenance and lubrication in projectile looms.
21. Identify different path and functions, types of Rapier loom and operate the same. TSC/N2223, TSC/N2225	Know the principle of operation of rapier looms.
	Identify the parts and functions of rapier looms.
	Know the settings of picking system and weft insertion cycle in rapier loom – time of entry, exit, meeting of rapiers at centre, etc.
	Know the settings of cam arrangement, shed geometry, weft accumulator, stop motion, take-up, let-off, sley drive, selvedge motion.
	Modify / alter data in the control panel according to weave style and other electronic features.
	Carry out maintenance and lubrication in rapier looms.
22. Identify different path and functions, types of Air-jet loom and operate the same. TSC/N2223, TSC/N2224	Know the principle of operation of air-jet looms.
	Identify the parts and functions of air-jet looms.
	Know the settings of picking system and weft insertion cycle in air-jet loom
	Know the air quality and its requirement for picking operation.
	Know the operation of air compressor and drier.
	Know the timings / settings of main, sub-nozzles, profiled reed, stretch nozzles.
	Know the settings of cam arrangement, shed geometry, weft accumulator, stop motion, take-up, let-off, sley drive, and selvedge motion.
	Modify / alter data in the control panel according to weave style and other electronic features.
	Carry out maintenance and lubrication in airjet looms.

23. Identify & apply QA system in textile industry. TSC/N9015	Know the concepts of quality and quality assurance.
	Know the ISO 9000 quality system and its importance.
	Know other systems of QA – ISO 14000, SA 8000, OHSAS 18000.
	Know the fabric quality parameters and testing methods.
24. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. TSC/N9402	Solve different mathematical problems
	Explain concept of basic science related to the field of study

7. TRADE SYLLABUS

SYLLABUS FOR WEAVING TECHNICIAN TRADE			
FIRST YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 147 Hrs; Professional Knowledge 31 Hrs	Plan and organize the work to make job as per specification applying different types of basic fitting operations and Check for dimensional accuracy following safety precaution. *[Basic fitting operations – marking, Hack-sawing, punching, Chiselling, Filing, Drilling, Grinding and job setting]* TSC/N9015	1. Observe the safety precautions during filing, marking and punching, internal fitting and drilling practice. (8 hrs) 2. Identify the type of hand tools, care and maintenance during various practices. (05 hrs) 3. Identify the cutting and measuring tools used for filing, marking and punching practice. (08 hrs) 4. Identify the types and specifications of drills, cutting angles, tap drills and dies used for internal fitting and drilling. (08 hrs) 5. Identify the geometrical construction of various types of grinding machine. (12 hrs) 6. Identify the various types of gauges, uses, care and maintenance. (13 hrs) 7. Identify the types of lathes, parts and its functions of lathe machinery. (17 hrs) 8. Identify the specification and different accessories	Trade instruction-safety-types of safety workshop safety-Hand Tools safety-personal safety. Hand tools-Types of hand tools- Types of tools used, Vices-specification-uses, care and maintenance. Accident-Prevention-machine men- Industry -Marking tools-calipers- Dividers-Surface plates-Angle plates-Scribers-punches- Surface gauges-Types-Uses, Care & maintenance. Cutting tools-Files-Chisels-Hacksaw blades-Scrapper-Various cutting angles and their uses-care &maintenance. Specification of steels flats & strips-specification steel flats & strips-specification of steel angles -Specification of steel sections. Measuring tools-Precision and non-precision-steel rule calipers- Vernier caliper-micrometer-Vernier Height gauge-depth gauge types-uses and Specification-calibration and setting as per standard. Measurement of angles-

		of lathe machinery. (08 hrs) 9. Filing to size and chipping. (09 hrs) 10. Marking and Punching, Hack sawing. (08 hrs) 11. Checking of different surfaces Open fitting of sized metals. (09 hrs) 12. Scrapping to rough and size. (08 hrs) 13. Internal Fitting. Drilling & Fitting. (09 hrs) 14. Grinding practice. (17 hrs) 15. Snap gauge filing. (08 hrs)	Vernier Bevel protractor-Graduation on universal Bevel protractor- Reading of universal Bevel Protractor. Drilling machine types-Drill chuck-specification Drill types – reamer types-various cutting angles-tapes and dies-types - uses-tap drills and dies calculation. Grinding m/c practice types method of drill bit and chisel grinding. Gauges- types- Uses- care & Maintenance - tolerance-limits - fits-definitions & applications. (31 hrs)
Professional Skill 84 Hrs; Professional Knowledge 18 Hrs	Plan and organize the work to make job on facing, chamfering, plain Turing, taper turning and simple thread. TSC/N9015	16. Turning Tool grinding tool setting & job setting. (09 hrs) 17. Facing and chamfering, plain turning. (13 hrs) 18. Different types of shoulder and small radius turning. (08 hrs) 19. Taper turning and simple thread forming. (12 hrs) 20. Select the different types of operations performed in lathe. (13 hrs) 21. Identify the cutting tool materials, types and selection of cutting angles. (12 hrs) 22. Select the uses and applications of various types of cutting angles. (13 hrs) 23. Identify the different types	Lathe-types-construction-parts - functions- specification. Lathe accessories. Different types of operations performed in lathe. Cutting tools materials-types selection-various cutting angles-uses and applications. Types of threads-application tapping and dyeing process metrics and inch threads. Different process of taper Turning & calculation. (18 hrs)

		of threads and its application for tapping and dyeing process. (04 hrs)	
Professional Skill 42 Hrs; Professional Knowledge 09 Hrs	Plan and identify different types of skill related to sheet metal work and on various types of welding practices like square butt joint, single V butt joint, arc welding and gas welding. TSC/N9015	24. Identify the various types of hand tools, marking and cutting tools used for sheet metal work. (04 hrs) 25. Identify soft and hard soldering operations used in sheet metal joint. (04 hrs) 26. Identify the types of sheets used for folding, notching, wiring and hemming operations. (04 hrs) 27. Identify the allowances and uses of sheets for folding, notching, wiring and hemming operations. (04 hrs) 28. Identify the tools, equipments and types of welding joints. (05 hrs) 29. Identify the various types of welding practices, electrodes and current selection for the welding process. (08 hrs) 30. Observe the specifications and safety precautions during welding practice. (04 hrs) 31. Observe the type of gases, pressure and nozzle selection used in gas welding. (04 hrs) 32. Perform the edge	Welding types-Arc Welding-Gas Welding- Welding tools and equipments Types of welding joints-Electrode and current selection-Specifications and safety precautions. Types of gases used in gas welding oxy acetylene flame setting Gas pressure and nozzle selection. Edge preparation for Arc & Gas Welding process. (09 hrs)

		preparation for arc and gas welding process. (05 hrs)	
Professional Skill 42 Hrs; Professional Knowledge 09 Hrs	Apply a range of skill to execute different carpentry work. TSC/N9015	33. Identify the hand and measuring tools, work holding devices used in carpentry. (04 hrs) 34. Identify the types of clamps, sizes and its uses in carpentry. (04 hrs) 35. Identify the plan and setting parameters for sharpening. (09 hrs) 36. Identify the different types of saws, setting parameters and its uses in carpentry. (06 hrs) 37. Familiar on specifications and uses of wood working machine. (03 hrs) 38. Identify adhesive types and its uses in carpentry. (08 hrs) 39. Simple mortise and Ten on joints practice. (08 hrs)	Carpentry hand tools-Measuring tools-Work holding devices- Bench vice. Work Bench - Clamps types-sizes - uses- safety methods saws-Plan types- setting Sharpening- Uses etc. Different types of saws-Saw setting-Types of joints-Application –wood working machine- specification and their uses. Adhesives type and uses. (09 hrs)
Professional Skill 126 Hrs; Professional Knowledge 27 Hrs	Plan, identify and test on electrical /electronic measuring instruments TSC/N9015	40. Identify the fundamental terms of work power, energy, units, voltage, current resistance, and colour codes. (12 hrs) 41. Identify the types of cables, standard wire gauge, ohm’s law and Kirchoffs law. (13 hrs) 42. Select the different electrical measuring instrument. (13 hrs) 43. Soldering practice-Series-Parallel connection	Atom & Atomic structure electrons- Fundamental terms, work, power, energy units voltage- current, resistance colour codes. Types of cables-standard wire Gauge-Ohm's law- Kirchoff s law. Series and parallel connection-Simple problems properties of conductor, semi conductor and insulator. Primary and secondary cells common electrical accessories and their specification. Demonstration

		Measurement of electrical energy- Multi-meter. (08 hrs) 44. Identify the properties of conductor, semi-conductor and insulator. (13 hrs) 45. Identify the primary and secondary cells, common electrical accessories and their specification. (13 hrs) 46. Demonstration & practice on fixing common electrical accessories. (04 hrs) 47. Identify the instruments used for testing. (04 hrs) 48. Testing of domestic appliances-Building layout assemble of small electrical circuits. (04 hrs) 49. Constructional of calling bell (Electromagnet) Testing. (04 hrs) 50. Rewinding of electromagnet identification of DC generator. (05 hrs) 51. Use of Ohmmeter and merger. (04 hrs) 52. Demonstration and Reading of Electrical Measuring Instruments. (04 hrs) 53. Testing of active & passive component with suitable meters like Ammeter, Voltmeter & Multimeter. (08 hrs)	and description of domestic appliances. Magnetism and Electro magnetism-simple-Motors Generators - Principles and rules applied. Explanation of electrical measuring instruments - Ammeter-Voltmeter-Wattmeter-Energy meter. Electronic Activities-Passive components- Resistors-Capacitors-inductors-coils-Simple rectifiers, power supply, amplifier-logic gates-Principle of operations. (27 hrs)

		54. Testing of DC & AC Assembly and testing of simple electronic circuits (power supply)Testing of amplifier. (09 hrs) 55. Measure and record the data by using the testing instrument like ammeter, voltmeter and multimete rof AC and DC. (08 hrs)	
Professional Skill 84 Hrs; Professional Knowledge 18 Hrs	Identify types of operation, test different textile machineries used in industries with the raw materials. TSC/N9407	56. Identify various Textile Machines. (08 hrs) 57. Industrial Visit to spinning, Weaving and Chemical Processing Units. (13 hrs)	**Orientation to Textile Sector:** Overview of Textile Industry-History, Scope &Future Prospects, Strengths & Weakness of the industry. (04 hrs)
		58. Collect various fibres samples. (04 hrs) 59. Identify collected fibres samples using various methods of identification. (17 hrs)	**Orientation to Fibres:** Definition of Textile Fibre. Classification of fibres with respect to Origin - natural, synthetic (man-made) and Regenerated types. (05 hrs)
		60. Collect various Samples of intermediate products in spinning. (10 hrs) 61. Collect various yarn samples: Cotton Yarn, Blended Yarns, Filament Yarns, Synthetic Yarns, etc. (11 hrs)	**Orientation to yarn manufacture:** Intermediate Products in Spinning Process: Bale, Lap, Silver, Comber Lap, Roving, Ring frame Cone / Spool etc., ***Rotor yarn (open-end), air-jet spinning yarn, etc.*** (05 hrs)
		62. **Determine Yarn Properties:** Count, Strength, unevenness %,twist etc. (21 hrs)	**Technical Data and terms in yarn trade:** Count, twist, Strength CSP, unevenness CV etc. (04 hrs)
Professional Skill 210Hrs; Professional Knowledge 42	Perform various Weaving preparatory processes using Important machine	63. Identify various Weaving Preparatory Machines. (08 hrs) 64. Industrial visit to see warp winding, Warping, Sizing&	**Weaving Preparatory:** Process Flow from yarn to fabric for cotton, blended synthetic yarns, types and

Hrs	settings, adjustments; material flow, Calculating Production, Efficiency, important parameters of various machines and their Maintenance. TSC/N2402	Beaming, Gaiting & Pirn Winding Machine. (17 hrs) 65. Calculate different important parameter of preparatory machines. packages – Warp Winding, Warping, Sizing& Beaming, Gaiting and Pirn Winding, etc. (17 hrs)	sizes of yarn. (08 hrs)
		66. Gearing arrangement, Passage of yarn, Winding & wind, wind per double traverse setting length & diameter setting. (25 hrs) 67. Setting of tensioner, Slub catcher, lubrication, maintenance schedules, & calculation of different important parameter of winding machine along with production & efficiency calculation. (29 hrs) 68. Calculate different important parameters of various winding machines. (08 hrs)	**Warp Winding:** Objects of Warp Winding, Types & functions, Drive system, different types of drums, different types of packages(Cone/spool/cheese)Tensioning arrangement, Stop Motion, Length &Diameter adjustment motion, winding package build up, tensioner, slub catcher, Yarn Clearers, Types, Mechanical and Electronic clearers, etc. Different types of knots. Brief study of package faults, causes and remedies. Study of Modern fully automatic winding machines. (13 hrs)
		69. Gearing arrangement, passage of yarn, over head blower, types of creel, stop motion function, tension bar arrangement, types of drive, direct and indirect – direction control valve, pneumatic and hydraulic.	**Warping:** Objects of Warping, Parts and functions, Creeling system, Drive system, brake disc, pressure gauge, blower, tension rod, rack and pinion, creel shifting mechanism , stop motion, clutch assembly, Difference between direct and sectional warping,

		(30 hrs) 70. Identify and operate brake and length measuring methods (speed control method, doffing system, maintenance schedules etc.). (17 hrs) 71. Calculate different important parameter of warping machines and related calculation along with Production Calculation. (17 hrs)	beaming mechanism, maintenance schedule, machine related technical data. Salient features of Modern Warping Machine. Concept of Computerized Sectional Warping. (13hrs)
		72. Gearing arrangement, passage of yarn, Winding and binding coil setting, Chase length setting, RPM and MPM changing on the machine, setting of reserve bunch, lubrication, maintenance schedules. (25 hrs) 73. Calculation of different important parameter of pirn, setting of the length and diameter of Pirn winding machine along with the calculation of production. (17 hrs)	**Pirn Winding:** Objects of Weft winding, Parts and functions, types of prin winding machines, bunch winding and changing mechanism, importance of stop motion, length measuring motion, maintenance schedule, pirn types, pirn buildup, automatic pirn Feeders, tension control spirn winding drives, avoiding of slough-off, setting of the length reserve bunch, pirn stripping, spindles, traverse mechanism, machine related technical data, etc. (08 hrs)
Professional Skill 84 Hrs; Professional Knowledge 18 Hrs	Identify different types of Sizing machines, their parts, functions and their maintenance schedule.	74. Control valves (Direction control valves and gate valves) servicing – hydraulic and pneumatic cylinder arrangement servicing – PIV, regulator and variator servicing,	**Sizing and Beaming machine:** Objects of Sizing, Parts and functions– types of machines, types of speed regulator. PIV, regulator and variator. Pressure gauges, safety valves, pneumatic; and

	TSC/N2107	lubrication and maintenance schedule. (63 hrs) 75. Calculate different parameter related with production and others, Creel marking length, length measurement system etc., Friction drive arrangement, sizing roller and beam roller surface speed, etc. (21 hrs)	hydraulic loading devices, creel changing mechanism, function of steam trap and rotary joint, direction control valves and gate valves, hydraulic and pneumatic cylinders, types of bearing used, lubrication method, types of reduction gearboxes and angular gearboxes, machine related technical details. (18 hrs)
Professional Skill 21 Hrs; Professional Knowledge 04 Hrs	Identify & apply sizing ingredients, formulation of recipe for cotton yarn, determine sizing cost and check production and efficiency of sizing machine. TSC/N2105	76. Determination of Sizing Cost, Percentage of application, factors affecting production and efficiency of the said Machines. (21 hrs)	Sizing Ingredients, Formulation of size recipe for cotton yarn and its blends. Size Mixing and Cooking etc. Single end sizing. Beam defects, causes and remedies. (04 hrs)
ENGINEERING DRAWING: (40 Hrs)			
Professional Knowledge ED- 40 Hrs.	Read and apply engineering drawing for different application in the field of work. TSC/N9401	**Introduction to Engineering Drawing and Drawing Instruments –** ▪ Conventions ▪ Sizes and layout of drawing sheets ▪ Title Block, its position and content ▪ Drawing Instrument **Free hand drawing of –** ▪ Geometrical figures and blocks with dimension ▪ Transferring measurement from the given object to the free hand sketches. ▪ Free hand drawing of hand tools. **Drawing of Geometrical figures:** ▪ Angle, Triangle, Circle, Rectangle, Square, Parallelogram. ▪ Lettering & Numbering – Single Stroke **Dimensioning Practice** ▪ Types of arrowhead **Symbolic representation** – ▪ Different symbols used in the Spinning / Textile wet processing /weaving Technician trades.	

		Reading of chemical plant Circuit Diagram **Reading of Chemical plant Layout drawing**
WORKSHOP CALCULATION & SCIENCE (24 Hrs)		
Professional Knowledge -WCS 24 Hrs	Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. TSC/N9402	**Unit, Fractions** • Classification of unit system • Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units • Measurement units and conversion • Factors, HCF, LCM and problems • Fractions - Addition, subtraction, multiplication & division • Decimal fractions - Addition, subtraction, multiplication & division • Solving problems by using calculator **Square root, Ratio and Proportions, Percentage** • Square and square root • Simple problems using calculator • Applications of Pythagoras theorem and related problems • Ratio and proportion • Ratio and proportion - Direct and indirect proportions • Percentage • Percentage - Changing percentage to decimal and fraction **Mass, Weight, Volume and Density** • Mass, volume, density, weight and specific gravity • Related problems for mass, volume, density, weight and specific gravity **Heat & Temperature and Pressure** • Concept of heat and temperature, effects of heat, difference between heat and temperature, boiling point & melting point of different metals and non-metals • Thermal conductivity and insulators • Concept of pressure - Units of pressure, atmospheric pressure, absolute pressure, gauge pressure and gauges used for measuring pressure **Basic Electricity** • Introduction and uses of electricity, electric current AC,DC their comparison, voltage, resistance and their units • Conductor, insulator, types of connections - series and parallel • Ohm's law, relation between V.I.R & related problems

		Levers and Simple machines • Lever & Simple machines - Lever and its types (Only Basics)
Project work/ Industrial Visit		

SYLLABUS FOR WEAVING TECHNICIAN TRADE			
SECOND YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 63 Hrs; Professional Knowledge 20 Hrs	Identify types of reed & heald wire and their use. TSC/N2218	77. Observation of Reed/Dents, Dent spacing. (08 hrs) 78. Dents/inch calculation and expressing reed count. (13 hrs)	**Expression of Reed/Heald Count:** Methods, different popular reed count System, Irish systems –Stockport, Bradford, Porter, different types of Heald and heald count. (07 hrs)
		79. Formation of Knots – Manually and Using Knotters, Gaiting through drop wires, sealed wires reed dents, etc. (42 hrs)	**Loom Gaiting:** Drawing-in & Tying-in. Types of pinning machines – manual, automatic and universal. Tying-in machines. Gaiting Sequence for different weave patterns – plain, twill, satin, sateen etc. (13 hrs)
Professional Skill 210Hrs; Professional Knowledge 68 Hrs	Prepare Point Paper for basic and modified weave types with design, draft & peg plan. TSC/N2218	80. Point Paper representation for basic weaves patterns, including drawing, denting, peg plan, etc. (168 hrs)	Designing of Basic Weaves: Plain, Derivatives of Plain Weaves – Regular and irregular warp rib, weft rib and matt weaves. Twill weave, derivative of twills, Pointed/zigzag/Herringbone /Broken twill, etc. (54 hrs)
		81. Point Paper representation for modified weave patterns. (42 hrs)	Designing of Modified Weaves: Satin/Sateen, Crepe, Honey Comb, Huck-a-back, Mock-leno weave, Bedford Cord weave. (14 hrs)
Professional Skill 21 Hrs; Professional Knowledge 07 Hrs	Check Quality parameters of defective yarn samples, End break study in looms.	82. Collection of defective package sample, End breakage study on looms producing fabrics with varying; yarn quality and	Yarn Quality Requirements: Yarn defects and remedies, Yarn Quality requirements for shuttle looms. (07 hrs)

	TSC/N2218	Different fabric quality. (21 hrs)	
Professional Skill 105 Hrs; Professional Knowledge 34 Hrs	Identify various weaving loom, their classification and Perform primary, secondary & auxiliary motion of loom using weaving machines. TSC/N2218	83. Familiarization to Weaving machines, Industrial Visit to Handloom, Non automatic and automatic power loom, Shuttleless looms etc. (42 hrs)	Fabric Formation: Principle, classification of looms – Handloom, Non-automatic and automatic power loom, Shuttleless looms: Advantages of automatic shuttle and shuttleless loom- Salient features of automatic shuttle and shuttleless. (13 hrs)
		84. Primary and secondary motion stiming with reference to slay position – setting of picks per inch – setting of proper shedding – changing of tappets for shedding –operating the loom– lubrication – attending warp and weft break. Picking force and timing setting and turning. (25 hrs) 85. Oscillating and vibrating back rest – anticlock motion –weft feeler mechanism(mechanical &electrical) – weft fork mechanism –shuttle protector –shuttle eye, thread cutter – temple cutter – trigger mechanism –bobbin protector. (25 hrs) 86. Calculation of loom constant, production efficiency, etc. (13 hrs)	**Plain Loom:** Objectives, Parts and functions, Passage of Material through Power loom, gearing diagram, tappet changing and fitting mechanism, weft changing mechanism, shuttle picking mechanism, beat up mechanism, take up mechanism, let off mechanism, stop motions, weft feeler mechanism, Warp Protecting mechanism, methods of drive, power transmission system elements, reversing motion, brake, starting handle, types of shuttle, maintenance schedule, machine related technical data. (21 hrs)
Professional Skill 42 Hrs;	Calculate loom constant, Production and	87. Study and analyze timing diagram of various types looms and its effect on	Loom Timing diagram. (06 hrs)

Professional Knowledge 13 Hrs	efficiency Timing Diagram, Fabric quality parameters. TSC/N9408	fabric quality, productivity and efficiency, etc. (21 hrs)	
		88. Trace Driving diagram for various looms and calculation of loom speed, adjustment of picking force, eccentricity of loom, etc. (21 hrs)	Loom drive: Crank shaft, bottom shaft and auxiliary shaft and Driving Diagram. Fabric defect, Causes and remedies. (07 hrs)
Professional Skill 21 Hrs; Professional Knowledge 07 Hrs	Identify, check the functions of dobby. TSC/N2218	89. Knife setting- selector pirn setting –return spring boxes –shed setting, Lubrication, schedule etc. (14 hrs) 90. Different calculation, i.e. production, efficiencies, etc. (07 hrs)	**Dobby:** Objectives, Parts and functions, Purpose and Principle, Card Cylinder, Single and double lift dobbies, paper and wooden lattice dobbies, pick finding with dobbies, return spring box. Types of dobby pick finding devices for dobby, paper pattern, greasing and oiling, maintenance schedule, settings, etc. Brief study of Electronic dobby and cross border dobby. (07 hrs)
Professional Skill 42 Hrs; Professional Knowledge 14 Hrs	Identify, execute the operation of Jacquard loom. TSC/N2223, TSC/N2225 TSC/N7308, TSC/N7309	91. Card punching – Synchronizing wit hloom-lift. (08 hrs) 92. Setting of jacquard-cam throws setting-harness setting and trying lubrication. (13 hrs) 93. Pirn alignment and firmness in shuttle –picking force and timing-shuttle checking in shuttle box-belt fork setting-loom brake function-warp protector motion function-anti crack motion-reed alignment and firmness – loom parts lubrication-shuttle box, swell setting-picker centering-reed	**Jacquard:** Functions – types of jacquards – card punching – single and double lift type jacquards for power looms-simple wooden peg type-drives-types of lingoes-Synchronizing with loom-return spring type-harness comber board-drafts-principle parts of the jacquard machine-sizes and figuring capacities of jacquard-types of sheds-lift and cylinder, types-casting out process-greasing and oiling-maintenance schedule-Brief study of cross border jacquard -Introduction to electronic

		alignmentand angle-race board alignment-warp protection motion-slay check and repair etc. (21 hrs)	Jacquards. (14 hrs)
Professional Skill 42 Hrs; Professional Knowledge 14 Hrs	Analyze and operate drop box loom. TSC/N2218	94. Picking timing of drop box looms –slay dwell of box loom– box alignment with race board –synchronizing of drop box with crank shaft of the loom – card punching for drop box control – lubrication, etc. (42 hrs)	**Drop Box Loom:** Objectives, Parts and functions, types of drop box motion –common uses of Eccle's and cam type drop box loom – single, double and triple box lift, dobby controlled drop box – card punching for drop box loom – weft patterning – greasing and oiling – maintenance schedule, etc. Brief Study of Pick-at-will motion. Terry motion. **Synthetic Weaving:** General loom requirement for synthetic and blended yarn weaving. Common fabric defects, causes and remedies. (14 hrs)
Professional Skill 126 Hrs; Professional Knowledge 41 Hrs	Identify different path and functions, types of Projectile loom and operate the same. TSC/N2223, TSC/N2227	95. Torsion rod setting. (08 hrs) 96. Guide tooth setting. (13 hrs) 97. Receiving unit and brake setting. (12 hrs) 98. Projectile conveyor setting. (13 hrs) 99. Assembly of picking and arrival side units. (12 hrs) 100. Deciding no. of projectiles as per cloth width. (13 hrs) 101. Assembly of cams for different weaves. (12 hrs) 102. Warp and weft stop motion settings. (08 hrs) 103. Mechanical and electronic let-off assembly and setting-differential gear box	**Projectile Loom :** Introduction – main features-advantages-basic drive-clutch brake-weft transfer (picking mechanism) – projectile picking, beat- up mechanism – shedding types-assembly of picking and arrival side units-emery roller-cleaning schedule and maintenance schedule-essential setting, etc. (41 hrs)

		assembling. (13 hrs) 104. Setting of picks/inch – emery roll covering-essential settings. (08 hrs) 105. Warp and weft breaks-lubrication. (09 hrs) 106. Adjustment of shed geometry. (05 hrs)	
Professional Skill 63 Hrs; Professional Knowledge 20 Hrs	Identify different path and functions, types of Rapier loom and operate the same. TSC/N2223, TSC/N2225	107. Settings of rapier as per nominal width. (08 hrs) 108. Change of throw-deciding rapier loom speed-shed height alignment-rapier weft transfer setting. (08 hrs) 109. Periodic check of rapier guides and resetting-picks/inch setting. (13 hrs) 110. Warp tension setting. (08 hrs) 111. Slay drive checking-lubrication. (13 hrs) 112. Machine setting avoiding warp and weft defects. (13 hrs)	**Rapier Loom:** Introduction – main features – advantages – method of weft insertion-types of weft stop- remedy for each type of weft stop –weft feeder introduction-rapier head-drive-classification of rapier weaving machines-working principle of rapier-Working of Electronic take up and let off motions – maintenance schedule – essential settings. (20 hrs)
Professional Skill 84 Hrs; Professional Knowledge *27* Hrs	Identify different path and functions, types of Air-jet loom and operate the same. TSC/N2223, TSC/N2224	113. Air insertion settings. (08 hrs) 114. Solenoid valve setting-deciding no. Of nozzles required-settings through microprocessor. (14 hrs) 115. Measuring air consumption. (14 hrs) 116. Changing of speeds, shedding. (13 hrs) 117. Change of weaves. (13 hrs) 118. Setting picks/ inch lubrication. (14 hrs) 119. Attending weft breaks. (08	**Air-jet Loom:** Introduction – main features-advantages – weft insertion cycle with profile speed – Loom timing - drives-clutch-brake-weft transfer-deciding no. of nozzles required-technique of measuring air consumption-picking mechanism-method of air-jet control- maintenance schedule- essential settings. Brief Study of Water jet loom – its salient features and weft insertion technique.

		hrs)	**Multi Phase Weaving:** Classification – circular machine – weaving principle – Sulzer M8300loom – Principle – Shed formation and Weft insertion. **Terry Weaving:** Classic terry and Fashion terry –Loom requirements for weaving terry fabrics. Passage of material through a modern terry weaving machine. **Brief study of Denim Weaving.**(27 hrs)
Professional Skill 21 Hrs; Professional Knowledge 07 Hrs	Identify & apply QA system in textile industry. TSC/N9015	120. Familiarization to QA Systems: Visit to Companies, which have ISO 9000certification.Concept of fabric quality. (21 hrs)	**Quality Assurance:** Concepts of quality, Control and Assurance. Introduction to ISO 9001-2000, ISO 14001-2004 & SA 8000systems,OHSAS-18001-1999.Testing of fabric Quality. (07 hrs)
WORKSHOP CALCULATION & SCIENCE: (28 Hrs.)			
Professional Knowledge - WCS 28 Hrs.	Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. TSC/N9402	**Friction** • Friction - Advantages and disadvantages, Laws of friction, co-efficient of friction, angle of friction, simple problems related to friction • Friction - Lubrication **Area of cut out regular surfaces and area of irregular surfaces** • Area of cut out regular surfaces - circle, segment and sector of circle • Related problems of area of cut out regular surfaces - circle, segment and sector of circle **Elasticity** • Elasticity - Elastic, plastic materials, stress, strain and their units and young's modulus • Elasticity - Ultimate stress and working stress **Estimation and Costing** • Estimation and costing - Simple estimation of the requirement of material etc., as applicable to the trade • Estimation and costing - Problems on estimation and costing	

Project Work/Industrial Visit

SYLLABUS FOR CORE SKILLS
1. Employability Skills (Common for all CTS trades) (120 Hrs + 60 Hrs)

Learning outcomes, assessment criteria, syllabus and Tool List of Core Skills subjects which is common for a group of trades, provided separately in www.bharatskills.gov.in / www.dgt.gov.in

ANNEXURE-I

List of Tools & Equipment			
WEAVING TECHNICIAN (For batch of 24 Candidates)			
S No.	**Name of the Tools and Equipment**	**Specification**	**Quantity**
A. TRAINEES TOOL KIT (For each additional unit trainees tool kit S. No. 1-25 is required additionally)			
1.	Combination Plier	200 mm insulated	25 (24+1) Nos.
2.	Screw Driver	200 mm	25 (24+1) Nos.
3.	Screw Driver	100 mm	25 (24+1) Nos.
4.	Terminal Screw Driver		25 (24+1) Nos.
5.	Hammer Ball Pein	0.25 kg	25 (24+1) Nos.
6.	Try Square	200 mm	25 (24+1) Nos.
7.	File round (half) 2nd cut	250 mm	25 (24+1) Nos.
8.	File round	150 mm	25 (24+1) Nos.
9.	Plumb Bob	115 gm.	25 (24+1) Nos.
10.	Bar wood Mallet	1 kg (75 mm x 150 mm)	25 (24+1) Nos.
11.	Knife		25 (24+1) Nos.
12.	Wood rasp file	250 mm	25 (24+1) Nos.
13.	Firmer chisel	12 mm	25 (24+1) Nos.
14.	Firmer chisel	6mm	25 (24+1) Nos.
15.	Neon Tester		25 (24+1) Nos.
16.	Tenon saw	250 mm	25 (24+1) Nos.
17.	File flat 2nd cut	25 cm.	25 (24+1) Nos.
18.	File flat Smooth	25 cm.	25 (24+1) Nos.
19.	Steel Rule	300mm to read Metric	25 (24+1) Nos.
20.	Test lamp		25 (24+1) Nos.
21.	Circlip Opener		25 (24+1) Nos.
22.	Continuity Tester		25 (24+1) Nos.
23.	Glouse		25 (24+1) Nos.
24.	Insulating Tape		25 (24+1) Nos.
25.	Electrical Soldering Iron		25 (24+1) Nos.
B. LIST OF GENERAL SHOP OUTFIT – For 2 (1+1) units no additional items are required			
26.	Pliers side cutting	200 mm	6 Nos.
27.	Pliers flat nose	150 mm	6 Nos.
28.	Pliers round nose		6 Nos.
29.	Pliers long nose		6 Nos.

30.	Screw driver heavy duty	250 mm	5 Nos.
31.	Screw driver	7 mm x 300 mm square blade	6 Nos.
32.	Firmer Chisel	25 mm	6 Nos.
33.	Firmer Chisel	10 mm	6 Nos.
34.	Marking Gauge		6 Nos.
35.	Combination bevel Protractor		2 Nos.
36.	Cold Chisel Flat	25 x 200 mm	5 Nos.
37.	Cold Chisel flat	18 x 200 mm	5 Nos.
38.	Hammer Ball Peen	0.5 kg	5 Nos.
39.	Hammer Ball Peen	0.75 kg	5 Nos.
40.	Hammer Ball Peen	1 Kg	5 Nos.
41.	Hammer Cross Peen	0.5 kg	5 Nos.
42.	Wall jumper octagonal	37mmx450mm, 37 mm x 600 mm	2 Nos.
43.	Centre punch	100 mm	5 Nos.
44.	File Flat	300 mm rough	5 Nos.
45.	File Flat 2nd cut	300 mm	5 Nos.
46.	File Flat Bastard	250 mm	5 Nos.
47.	File flat smooth	250 mm	5 Nos.
48.	File half round 2nd cut	300 mm	5 Nos.
49.	File triangular 2nd cut	150 mm	5 Nos.
50.	Spanner double ended	set of 6	5 sets
51.	Adjustable Spanner	350 mm	2 sets
52.	Foot Print grip	250 mm	2 sets
53.	Allen keys	Metric & Inches	24 sets
54.	Steel rule	300 mm	5 Nos.
55.	Steel Measuring Tape	2m	5 Nos.
56.	Steel Measuring Tape	20 m	2 Nos.
57.	Hacksaw frame Adjustable	200 mm to 300 mm	5 Nos.
58.	Spirit level	300 mm	3 Nos.
59.	Bench vice	150 mm	3 Nos.
60.	Bench vice	100 mm	2 Nos.
61.	Pipe Wrench	300 mm	12 Nos.
62.	Spanner	up to 32 mm	12 Nos.
63.	Vernier Caliper		2 Nos.
64.	Ring spanner		3 sets
65.	Grip Plier	12"	5 Nos.
66.	Inner caliper		5 Nos.
67.	Outer caliper		5 Nos.
68.	Box spanner		5 sets
69.	Torque spanner		3 Nos.
70.	File Swiss type needle set		5 Nos.
71.	Shore hardness tester for		1 No.

72.	Needle file		3 sets
73.	Nylon hammer		5 Nos.
74.	Puller	2 arm, 3 arm	3 each
75.	Copper tube cutter		3 Nos.
76.	Ratchet brace	6 mm capacity	5 Nos.
77.	Ratchet bit	4mm and 6 mm	5 Nos.
78.	Vernier Caliper	200mm (ordinary)	5 Nos.
79.	Snips		5 Nos.
80.	Conduit Pipe die set		5 Nos.
C. LIST OF MACHINERY & EQUIPMENT			
81.	Warp Winding Machine		1 No.
82.	Pirn Winder		1 No.
83.	Plain loom with Dobby		1 No.
84.	Handloom with jack & loom arrangement		1 No.
85.	Drum Type/ sectional warping & Beaming machine		1 No.
86.	Handloom with Jacquard		1 No.
87.	Chittaranjan Semiautomatic Power Loom		1 No.
88.	Hand Knotter, Splicer etc		1 Each
89.	Shuttleless Repair loom		1 No.
D. FURNITURE			
90.	Work bench with four vices of 12.5 cm	250x120x75	4 Nos.
91.	Locker with 8 drawers (standard size)		2 Nos.
92.	Metal Rack	180x150x45cm	2 Nos.
93.	Steel almirah / cupboard		1 No.
94.	Black board and easel		1 No.
95.	Instructor's Desk or table		1 No.
96.	Chair		1 No

Note: -

1. *All the tools and equipment are to be procured as per BIS specification.*

ABBREVIATIONS

CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Craft Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities


कौशलं बलम्