

**SYLLABUS FOR THE TRADE OF
WEAVING TECHNICIAN**

**UNDER
CRAFTSMEN TRAINING SCHEME**

DESIGNED IN

2006

**GOVERNMENT OF INDIA
MINISTRY OF LABOUR & EMPLOYMENT
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
EN BLOCK, SECTOR V, SALT LAKE CITY
KOLKATA- 700091**

List of Members attended the Trade Committee Meeting held on 18.07.2006 at CSTARI, Kolkata for designing of syllabi for the Trade of 1) Spinning Technician, 2) Weaving Technician, 3) Textile Mechatronics and 4) Textile Wet Processing (Textile Group of Trades) under CTS.

<u>SL.NO.</u>	<u>NAME</u>	<u>DESIGNATION & ORGANISATION</u>	
1.	Shri G.Bhowmik	Director, CSTARI, Kolkata	Chairman
2.	Dr. S.M. Chatterjee	Advisor, Tech. Edu., Govt. of W.B., Kalyani	Member
3.	Dr.A.K.Samanta	Instt. of Jute Technology, Kolkata	Member
4.	Prof. Swapan Kr. Ghosh	Instt. of Jute Technology, Kolkata	Member
5.	Dr. Satyaki Bhattacharyya	Kalyani Govt. Engg. College, Kalyani	Member
6.	Shri T.Sundararaj	Commissioner of Emp.&Trg., Chennai-32	Member
7.	Shri S. Mondal	Dy. Director, ITI Gariahat	Member
8.	Shri S.S.Pal	Kalyani, Spinning Mill	Member
9.	Dr. S.K.Mandal	NITTTR, Kolkata	Member
10.	Shri P.Sengupta	Jaya Shree Textiles, Rishra-712249	Member
11.	Shri Sunanda Mitra	Apparel Export Promotion Council	Member
12.	Shri Amitabha Ray	Kalyani Spinning Mill	Member
13.	Shri T.Mukhopadhyay	Dy. Director Of Trg. CSTARI, Kolkata	Member
14.	Shri A.Chakraborty	Asstt. Director of Trg. CSTARI, Kolkata	Member
15.	Shri R.B.Ram	Asstt. Director of Trg. CSTARI, Kolkata	Member
16.	Shri S.B.Sardar	Training Officer, CSTARI, Kolkata	Member
17.	Shri P.K.Kolay	Training Officer, CSTARI, Kolkata	Member
18.	Shri R.N.Manna	Training Officer, CSTARI, Kolkata	Member

GENERAL INFORMATION

1. Name of the Trade : Weaving Technician
2. N.C.O. Code No. :
3. Entry Qualification : Pass in 10th Class Exam under 10+2 system of education with Science and Mathematics or its equivalent.
4. Duration of Craftsmen Training : 2 YearS
5. Space requirement : 525 Sq. Meter

SYLLABUS FOR THE TRADE OF

WEAVING TECHNICIAN

UNDER THE CRAFTSMEN TRAINING SCHEME

DURATION OF TRAINING – 2 YEARS

PART – I (1st and 2nd Semester) :

SEMESTER – I: Basic Training for 6 months (WEEKS – 1 to 26)

Fitting	- 8 weeks,
Turning	- 4 weeks,
Sheet metal work	- 3 weeks,
Welder	- 2 weeks,
Carpentry	- 2 weeks,
Electrical	- 4 weeks,
Electronics	- 3 weeks.

SEMESTER – II: Basic Orientation Training to Textile Sector for 6 months (WEEKS – 27 to 53)

Orientation to Textile Sector	-1 week,
Orientation to Fibres	-1 week,
Orientation to yarn manufacture	-1 week,
Basic Principles of Yarn formation by ring spinning	-1 week,
Technical Data and terms in yarn trade	-1 week,
Weaving Preparatory	-2 weeks,
Warp Winding	-3 weeks,
Warping	-4 weeks,
Pirn Winding	-4 weeks,

Sizing and Beaming machine	-6 weeks,
Sizing Recipe and its Solutions	- 2 weeks,

PART – II (3rd & 4th semester):

SEMESTER III: Basic Orientation Training to Preparatory Sector for 6 months (WEEKS – 53 to 78)

Expression of Reed Count	– 1 week,
Loom Gaiting	– 3 weeks,
Designing of Basic Weaves	- 4 weeks,
Designing of Modified Weaves	-2 weeks,
Yarn Quality Requirements	- 2 weeks,
Fabric Formation	- 4 weeks,
Plain Loom	- 4 weeks,
Loom Timing Diagram	- 1 week,
Loom Drive	- 1 week,
Dobby	- 2 weeks,
Jacquard	- 2 weeks,

SEMESTER IV: Basic Orientation Training to Loom Sector for 6 months (WEEKS – 79 to 104)

Drop Box Loom	- 4 weeks,
Projectile Loom	- 7 weeks,
Rapier Loom	- 5 weeks,
Air- Jet Loom	-4 weeks,
Quality Assurance	-4 weeks,
Revision Test	- 2 weeks.

SYLLABUS FOR THE TRADE OF WEAVING TECHNICIAN DURATION - 2 YEARS

SEMESTER - I	Total – 26 weeks	Week No. – 1 to 26.
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WEEK NO.	PRACTICAL	THEORY	ENGINEERING DRAWING	WORKSHOP CALCULATION & SCIENCE
1.	FITTING: Filing Practice	Trade instruction-safety-types of safety-workshop safety-Hand Tools safety-personal safety. Hand tools – Types of hand tools – Types of vices – specification – uses, care and maintenance	Importance of Engg. Drawing – Methods of drawing – Instruments and equipments-uses in Engg. Drawing	Fraction Decimals Basic Arithmetic Operations – Addition and Subtraction
2.	Filing to size and chipping	Accident – Prevention – Machine – men –Industry – Marking tools – calipers – dividers – Surface plates – Angle plates – Scribers – punches – surface gauges – Types – Uses, Care & maintenance.	Types of lines – their meanings, Applications as per IS: 696	Fraction & decimals: Basic Arithmetic Operations – Multiplication – Divisions – Complex Problems of basic operations
3.	Marking and Punching	Cutting tools-Files – Chisels – Hacksaw blades – Scrapper – Various cutting angles and their uses – care & maintenance – specification steel flats & strips – specification of steel angle – specification of steel sections	Simple conventional symbols for material and parts as per IS - 696	Properties & Uses of Metals and Non-metals.
4.	Open fitting of sized metals	Measuring tools – Precision and non-precision – steel rule – calipers – Vernier caliper –	Construction for geometrical drawings angles and triangles.	System of units – British – Metric S.I Units for Length –

		micrometer – Vernier Height gauge – depth gauge types – uses and specification – calibration and setting as per standard		area – volume – capacity weight – time – force – temperature – their conversion
5.	Scrapping to rough and size	Measurement of angles – Vernier Bevel protractor – Graduation on universal Bevel protractor – Reading of universal Bevel Protractor	Geometrical construction of Rectangle – Square – Triangle – Circle	Principle of corrosion – corrosive materials and non-corrosive materials – causes and remedies.
6.	Internal Fitting, Drilling & Fitting	Specification Drill types – reamer types – various cutting angles – taps and dies – types – uses – tap drills and dies calculation- types of hammer.	Polygons and ellipse, parabola and hyperbola	Acceleration – speed- Equation of motion – Friction – Principles of friction – related problems
7.	Grinding m/c Practice types – method of drill bit and chisel grinding	Geometrical construction of involute, oval, and helix. Reviewing the various geometrical constructions.	Concept of scalar and vector quantity with examples. Newton's laws of motion. Law of conservation of momentum – mass – weight - density	
8.	Snap gauge filing	Gauges – types – Uses-Care & maintenance – tolerance – limits – fits – definitions & applications.	Free hand practice on printing style for standard letters and numbers	Square roots factorization method – division method.
9.	TURNING: Tool grinding- tool setting & job setting	Lathe- types – construction – parts- functions – specification. Lathe accessories.	Free hand practice on printing style for standard letters and numbers	Percentage – changing percentage to decimal vice versa- simple problems.
10.	Facing and chamfering, plain turning	Different types of operations – performed in lathe	Free hand sketching of St. lines. Rectangles, Circles, Square,	Heat treatment of metals – methods for Heat treatment

			Polygons and ellipse.	
11.	Different types of shoulder and small radius turning	Cutting tools materials – types – selection-various cutting angles – uses and applications	Free hand sketching of simple geometrical solids cube, prism, cylinder sphere, pyramids.	Work –power – energy –simple problems.
12.	Taper turning and simple thread forming	Types of threads – application – tapping and dieing process – metrics and inch threads. Different process of paper turning & thread calculation	Free hand sketch of measuring tools, steel rule, inner caliper, outer caliper.	Different types of force- Stress – strains – modules of elasticity simple problems.
13.	Sheet Metal Work Marking and simple sheet metal joints	Sheet metal hand tools –marking tools – cutting-shaping tools – types and uses	Free hand sketch of measuring tools, Vernier Caliper, Micrometer	Ratio and proportion. Applications, Simple problems.
14.	Cylinder with brazed joint	Standard wire gauge – soft and hard soldering various allowances – used in sheet metal joint	Free hand sketch of Hand tools. Various types of Hammers Spanners, Allen Keys, Feeler Gauge.	Simple machines – principles of M.A – V.R. – of simple mechanism of simple machines.
15.	To make simple trays – riveted and solder joints	Types of sheets & uses – folding – notching –wiring-hemming – allowances and uses.	Free hand sketch of Hand tools. Chisel, Various types of punches.	Algebra symbols use in algebra – co-efficient terms unlike terms – addition- subtraction- multiplication and division.
16.	Welding: Welding practice Straight line bead-square butt joint – single ‘V’ Butt joint	Welding types – Arc Welding – Gas Welding – Welding tools and equipments- Types of welding joints –Electrode and current selection – Specifications and safety precautions	Scales construction of plain scale. Representing faction	Algebra power & exponents – Laws of exponents.
17.	Welding practice:	Types of gases used in gas	Simple dimensioning	Algebraic

	Using gas welding	welding oxy acetylene flame setting Gas pressure and nozzle selection. Edge preparation for Arc & Gas welding process	technique size and location dimension for parts, holes, Angles Taper, Screw, etc. as per IS: 696.	simplification problems
18.	Carpentry: Simple planning, sawing and chiseling	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.	Simple dimensioning technique size and location dimension for parts, holes, Angles Taper, Screw, etc, as per IS: 696	Algebraic simplification problems
19.	Simple mortise and Tenon joints practice	Different types of saws – Saw setting –Types of joints – Application – wood working machine – specification and their uses. Adhesives type and uses.	Dimensioning practice Unidirectional system and Aligned system	Equations: Simple simultaneous, quadratic
20.	Electrical: Demonstration and identification of cables. Soldering practice – Series – Parallel connection Measurement of electrical energy – Multi meter	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	Dimensioning practice: Unidirectional system and Aligned system	Application, construction and solution of problems.
21.	Demonstration & practice on fixing common electrical accessories. Testing of domestic appliances – Building layout assemble of small electrical circuits.	Series and parallel connection – Simple problems – properties of conductor, semi conductor and insulator. Primary and secondary cells common electrical accessories and their specification. Demonstration and description of domestic appliances.	Isometric view of simple solids; cubes and Regular solids.	Use of Logarithm and anti logarithm table. Logarithm and exponent.
22.	Construction of	Magnetism and electro	Isometric view of simple	Basic operations

	Calling Bell (Electromagnet) Testing. Rewinding of electromagnet – identification, of DC generator. Use of Ohmmeter and Megger.	magnetism – simple – Motors generators – principles and rules applied	solids, Cubes and Regular solids	involving logarithm in the computation.
23.	Demonstration and Reading of Electrical Measuring Instruments	Explanation of electrical measuring Instruments – Ammeter-Voltmeter-wattmeter-Energy meter	Isometric view of tapered blocks: Single sided and Double sided.	Problems related to the trade using logarithm tables
24 & 25.	Electronics: Testing of active & passive component with suitable meters like Ammeter, Voltmeter & Multimeter-Testing of DC & AC Assembly and testing of simple electronic circuits (power supply) Testing of amplifier	Electronic Activities – Passive components –Resistors – Capacitors-inductors –coils- Transformers- Relays- Applications and Uses. All PN diodes Transistor IC’s, simple and logic gates, Application and uses. Simple rectifiers, power supply, amplifier-logic gates – Principle of operations	Isometric view of stepped blocks: Single & Double sided and Center ‘v’ shape Isometric view of complicated blocks – combined of simple, tapered and stepped blocks	Fundamental geometrical definition angles and properties of angles, triangles, properties of triangles. Pythagoras theorem, properties of similar triangles
26	Class Test	Class Test	Class Test	Class Test

SEMESTER - II	Total – 26 weeks	Week No. – 27 to 52.
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27.	Orientation to Textile Sector:	Familiarization to Textile Machines Industrial Visit	Isometric view of complicated blocks –	Equations: simple simultaneous,
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	Overview of Textile Industry- History, Scope & Future Prospects, Strengths & Weakness of the industry	to spinning, Weaving and Chemical Processing Units.	combined of simple, tapered and stepped Blocks.	quadratic etc.
28.	Orientation to Fibres: Definition of Textile Fibre. Classification of fibres with respect to Origin- natural, synthetic (man-made) and regenerated types.	Collection of various fibres samples and methods of identification	Drawing of sectional & longitudinal shape of fibres	Basic problems related with logarithm .Use of logarithm and anti-logarithm table. Logarithm and exponent.
29.	Orientation to yarn manufacture: Intermediate Products in Spinning Process: Bale, Lap, Silver, Comber Lap, Roving, Ring frame Cone / Spool etc.	Collection of Samples of intermediate products in spinning. Collection of various yarn samples: Cotton Yarn, Blended Yarns, Filament Yarns, Synthetic Yarns, etc.	Interconvention of isometric, oblique drawings of vice-versa along with shape and size of different Wound packages.	Fundamental methods used for transmitting motion and the calculation involved therein. Speed calculations, velocity ratio to the waving preparatory machine.
30.	Technical Data and terms in yarn trade: Count, twist, Strength CSP, unevenness CV etc.	Determination of Yarn Properties: Count, Strength, unevenness %, twist etc.	Interconvention of isometric, oblique drawings of and vice-versa.	Fundamental geometrical definition angles and properties of angles, triangles, properties of triangles. Pythagoras theorem, properties similar triangles.
31-32.	Weaving Preparatory: Process Flow from yarn to fabric for cotton, blended synthetic yarns, types and sizes of yarn packages –Warp Winding, Warping, Sizing &	Familiarization to Weaving Preparatory Machines – Industrial visit to see warp winding, Warping, Sizing & Beaming, Gaiting & Pirn Winding Machine.	Interconvention of isometric, oblique drawings of different Weaving preparatory machineries.	Rectangle, Square, Rhombus and Parallelogram and their properties.

	Beaming, Gaiting and Pirn Winding, etc.	Calculation of different important parameter of preparatory machines.		
33-35	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, etc.	Winding & wind, wind per double traverse setting length & diameter setting. Setting of tensioner, slub catcher, lubrication, maintenance schedules, & calculation of different important parameter of winding machine along with production & efficiency calculation. Calculation of different important parameters of various winding machines.	Line diagram of different winding machine with respect to their driving arrangement for spool/cheese /cone changing system etc.	Circle and Properties of Circle and regular Polygons.
36-39.	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, beaming mechanism, maintenance schedule, machine related technical data.	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 – type of brake and length measuring method – speed control method – doffing system – maintenance schedules etc. Calculation of different important parameter of warping machines and related calculation. Calculation of different important parameters of various	Simple line diagram of different types of warping machine and label all the diagrams properly.	Specific heats of solids and liquids, quantity of heat and its related calculations.

		types of warping machine.		
40 – 43.	Pirn Winding: Parts and functions, types of prim winding machines, bunch winding and changing mechanism, importance of stop motion, length measuring motion, maintenance schedule, pirn types, pirn build up, automatic pirn Feeders, tension controls pirn winding drives, avoiding of slough-off, setting of the length reserve bunch, pirn stripping, spindles, traverse mechanism, machine related technical data, etc.	Winding and binding coil setting chase length setting, RPM and MPM changing on; the machine, setting of reserve bunch, lubrication, maintenance schedules and calculation of different important parameter of pirn, setting of the length and diameter of Pirn winding machine along with the calculation of production.	Line diagram of pirn winding machine with respect to driving arrangement of pirn and pirn changing mechanism, etc.	Heat loss and Heat gain of Solids and liquids with simple problems.
44- 49.	Sizing and Beaming machine: Parts and functions – types of machines, types of speed regulator. PIV, regulator and variator. Pressure gauges, safety valves, pneumatic; and 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 gear boxes and angular gear boxes, machine related technical	Control valves (Direction control valves and gate valves) servicing – hydraulic and pneumatic cylinder arrangement servicing – PIV, regulator and variator servicing, lubrication and maintenance schedule. Calculation of 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.	Simple line diagram of different types of Sizing and Beaming machine and label all the diagrams properly.	Menstruation: Plain figures, triangles square, rectangle, parallelogram, etc.

	data, maintenance schedule, etc.			
50-51.	Sizing Ingredients, Formulation of size recipe for cotton yarn and its blends. Size Mixing and Cooking etc.	Determination of Sizing Cost, Percentage of application, factors affecting production and efficiency of the said M/cs.	Orthographic views of stepped blocks and tapered blocks, etc.	Trapezium, regular polygons, circle & related geometrical figure.
52	Class Test	Class Test	Class Test	Class Test

SEMESTER - III	Total – 26 weeks	Week No. – 53 to 78.
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53.	Expression of Reed/Heald Count: Methods, different popular reed count System, Irish systems – Stockport, Bradford, Porter, different types of Heald and heald count	Observation of Reed/Dents, Dent spacing. Dents/inch calculation and expressing reed count.	Orthographic views of curved blocks.	Solid figures: Prism, figure, Cylinder, Pyramid, cone.
54-56.	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.	Formation of Knots – Manually and Using Knotters, Gaiting through drop wires, sealed wires reed dents, etc.	Orthographic views of curved blocks.	Trigonometry: Trigonometric ally ratios use of Trigonometric al table.
57-59.	Designing of Basic Weaves: Plain, Twill, and Satin/Sateen, derivative of twills, etc.	Point Paper representation for basic weaves patterns, including drawing, denting, peg plan, etc.	Ortho graphic views of complicated blocks (both of taper & curve)	Area of triangle by trigonometry, Simple

				problems, etc.
60-61.	Designing of Modified Weaves: Warp/Weft rib, Pointed/zigzag/Herringbone /Broken twill, etc.	Point Paper representation for modified weave patterns.	Orthographic views of complicated blocks (both of taper & curve)	Finding height and distance by trigonometry.
62.	Yarn Quality Requirements: Yarn defects and remedies, Yarn Quality requirements for shuttle looms.	Collection of defective package sample, End breakage study on looms producing fabrics with varying; yarn quality and different fabric quality.	Orthographic views of complicated blocks (both of taper & curve)	Application of trigonometry to shop problems.
63-66.	Fabric Formation: Principle, classification of looms – Handloom, Non-automatic and automatic power loom, Shuttles looms: Advantages of automatic shuttle and shuttles loom- Salient features of automatic shuttle and shuttles looms, etc.	Familiarization to Weaving machines, Industrial Visit to Handloom, Non-automatic and automatic power loom, Shuttles looms etc.	Orthographic views of complicated blocks (both of taper and curve)	Triangle of forces, parallelogram of forces.
67-71.	Plain Loom: Objectives, Parts and functions, 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, methods of drive, power transmission system elements, reversing motion,	Primary and secondary motions timing 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 tuning. Oscillating and vibrating back rest – anti clock motion – weft feeler mechanism (mechanical & electrical) – weft fork mechanism – shuttle	Riveted joints. Various types of joints as per ISI standard. Sketches for simple pipe unions with simple pipe line drawings.	Ohm's law. Simple; calculation, electrical insulating materials.

	brake, starting handle, types of shuttle, maintenance schedule, machine related technical data.	protector – shuttle eye, thread cutter – temple cutter – trigger mechanism – bobbin protector. Calculation of loom constant, production efficiency, etc.		
72.	Loom Timing diagram	Study and analyze timing diagram of various types looms and its effect on fabric quality, productivity and efficiency, etc.	Concept of preparation of assembly drawing and detailing. Simple assemblies and their details of trade related tools/jobs/exercises with the dimensions from the given sample or models.	Mechanical properties of metals.
73.	Loom drive: Crank shaft, bottom shaft and auxiliary shaft and Driving Diagram.	Trace Driving diagram for various looms and calculation of loom speed, adjustment of picking force, eccentricity of loom, etc.	Simple assemblies and their details of trade related tools/jobs/exercises with the dimensions form the given sample or models.	Heat treatment of steels hardening, annealing, tempering, normalizing, casehardening , standard and measurement.
74-75.	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 doobby pick finding devices for doobby, paper	Knife setting – selector pirn setting – return spring boxes – shed setting, Lubrication, schedule etc. Different calculation, i.e. production, efficiencies, etc.	Simple assemblies and their details of trade related tools/jobs/exercise with the Dimensions from the given sample or models.	Heat treatment of steels hardening, annealing, tempering, normalizing, case-

	pattern, greasing and oiling, maintenance schedule, settings, etc.			
76-77.	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-introduction to electrical Jacquards.	Card punching – Synchronizing with loom-lift setting of jacquard-cam throw setting-harness setting and trying-lubrication. 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 alignment and angle-race board alignment-warp protection motion-slay check and repair etc.	Details of assembly of shaft and pulley. Details of assembly of a simple coupling and different types of loom motion.	Importance of Statistics – Measures of location: Arithmetic mean, Median, Mode, Geometric mean and Harmonic mean.
78	Class Test	Class Test	Class Test	Class Test

SEMESTER - IV	Total – 26 weeks	Week No. – 79 to 104.
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79-82.	Drop Box Loom: Objectives, Parts and functions, types of drop box motion – common uses of Excel’s and cam type drop box loom – single, double and	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	Details and assembly of Vee-Blocks with clamps.	Transmission of power by belt pulleys and gear drive.
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	triple box lift, dobbie controlled drop box – card punching for drop box loom – weft patterning – greasing and oiling – maintenance schedule, etc.	control – lubrication, etc.		
83-89.	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.	Torsion rod setting – guide tooth setting-receiving unit and brake setting-projectile conveyor setting-assembly of picking and arrival side units-deciding no. of projectiles as per cloth width-assembly of cams for different weaves-warp and weft stop motion settings-mechanical and electronic let-off assembly and setting-differential gear box assembling – setting of picks/inch-emery roll covering-essential settings-warp and weft breaks-lubrication-adjustment of shed geometry.	Blue print reading. Simple exercises related to missing lines.	Measures of Depression: Quartile deviation, Mean deviation, Standard deviation and Co-efficient of regression.
90-94.	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-maintenance schedule-essential settings.	Settings of rapier as per nominal width-change of throw-deciding rapier loom speed-shed height alignment-rapier weft transfer setting-periodic check of rapier guides and resetting-picks/inch setting-warp tension setting-slay drive checking-lubrication-machine setting avoiding warp and weft defects.	Blue print reading. Simple exercises related to missing views.	Important of strength of materials – Types of forces on Metals. Types stress and strain-Related problems.
95-	Air-jet Loom:	Air insertion settings-solenoid	Blue print reading.	Principles of

98.	Introduction – main features-advantages-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.	valve setting-deciding no. of nozzles required-settings through microprocessor-measuring air consumption-changing of speeds-shedding-change of weaves-setting picks/inch-lubrication-attending weft breaks.	Simple exercises related to missing symbols.	elasticity and relation between modulus of elasticity's.
99-102	Quality Assurance: Concepts of quality, Control and Assurance. Introduction to ISO 9001-2000, ISO 14001-2004 & SA 8000 systems, OHSAS-18001-1999.	Familiarization to QA Systems: Visit to Companies, which have ISO 9000 certification.	Blue print reading. Simple exercises related to missing dimensions.	Absolute Pressure Vacuum Pressure, Gauge Pressure, Relative Pressure-Static Pressure, Pressure Gauge.
103	Testing of fabric quality	Concept of fabric quality	Revision	Revision
104	Test	Test	Test	Test

Note: -

i) The trainees should be taken around the textile mills, to show them the machining processes in the shop floor especially those, which are not possible in the training institutes, in different sections concerned. There should be at least four industrial visits for 1) Preparatory department up to warping, 2) Beaming and Sizing department 3) Plain Loom shed including Dobby and Jacquard fitted Looms 4) Shuttle less Loom including Drop box Mechanism.

ii) Necessary workshop calculation should also be taught along with concerned theory portion wherever it is found essential.

Social Studies – The syllabus is already approved and common for all trades.

1. LIST OF TOOLS :

Sr. No.	Name of Tools	For Trainees	For Instructor
1.	Combination Plier 200 mm insulated	20	1
2.	Screw Driver 200 mm.	20	1
3.	Screw Driver 100 mm.	20	1
4.	Terminal Screw Driver	20	1
5.	Hammer Ball pein (0.25 kg)	20	1
6.	Try square (200 mm.)	20	1
7.	File round (half) 2 nd cut 250 mm.	20	1
8.	File round 150 mm.	20	1
9.	Plumb bob 115 gm.	20	1
10.	Barwood Mallet 1 kg (75 mm. X 150 mm.)	20	1
11.	Knife	20	1
12.	Wood rasp file 250 mm.	20	1
13.	Firmer chisel 12 mm.	20	1
14.	Firmer chisel 6 mm.	20	1
15.	Neon Tester	20	1
16.	Tenon saw 250 mm.	20	1
17.	File flat 25 cm. 2 nd cut	20	1
18.	File flat 25 cm. smooth	20	1
19.	Steel rule 300 mm to read Metric.	20	1
20.	Test lamp	20	1
21.	Circlip opener	20	1
22.	Continuity Tester	20	1
23.	Gloves	20	1
24.	Insulating tape	20	1
25.	Electrical soldering Iron	20	1
			Total

2. List of Shop General Outfit :

Sr. No.	Name of the tools & equipments	Quantity
1.	Pliers side cutting 200 mm.	10
2.	Pliers Flat nose 150 mm.	5
3.	Pliers round nose	5
4.	Pliers long nose	10
5.	Screw driver heavy duty 250 mm.	10
6.	Screw driver 7 mm X 300 mm square blade	10
7.	Firmer Chisel 25 mm	10
8.	Firmer Chisel 10 mm	10
9.	Marking Gauge	5
10.	Combination bevel Protractor	3

11.	Cold Chisel Flat 25 x 200 mm	4
12.	Cold Chisel flat 18 x 200 mm	4
13.	Hammer Ball Pein 0.5 kg	5
14.	Hammer Ball Pein 0.75 kg	5
15.	Hammer Ball Pein 1 Kg	5
16.	Hammer Cross Pein 0.5 kg	5
17.	Wall jumper octagonal 37mmx450mm, 37 mm x 600 mm	2 each
18.	Centre punch 100 mm	5
19.	File Flat 300 mm rough	5
20.	File Flat 300 mm 2 nd cut	5
21.	File Flat 250 mm Bastard	5
22.	File flat 250 mm smooth	5
23.	File half round 300 mm 2 nd cut	5
24.	File triangular 150 mm 2 nd cut	4
25.	Spanner double ended set of 6	5 set
26.	Adjustable Spanner 350 mm	2 set
27.	Foot Print grip 250 mm	2 set
28.	Allen keys (Metric & Inches)	20 set
29.	Steel rule 300 mm	5
30.	Steel Measuring Tape (2m)	5
31.	Steel Measuring Tape (20 m)	2
32.	Hacksaw frame Adjustable 200 mm to 300 mm	5
33.	Spirit level 300 mm	3
34.	Bench vice 150 mm	3
35.	Bench vice 100 mm	2
36.	Pipe Wrench (300 mm)	10
37.	Spanner (up to 32 mm)	10
38.	Vernier Caliper	2
39.	Ring spanner	3 set
40.	12" grip Plier	4
41.	Inner caliper	5
42.	Outer caliper	5
43.	Box spanner	4 set
44.	Torque spanner	3
45.	File Swiss type needle set	5
46.	Shore hardness tester for	1
47.	Needle file	3 set
48.	Nylon hammer	5
49.	Puller 2 arm, 3 arm	3 each
50.	Copper tube cutter	5
51.	Ratchet brace 6 mm capacity	5
52.	Ratchet bit 4mm and 6 mm	5
53.	Vernier Caliper 200mm (ordinary)	5
54.	Snips	5
55.	Conduit Pipe die set	5

3. List of Machinery and Equipments:

A. List of Preparatory & Weaving Machinery:

Sr. No.	Machinery	Required (No.)
1.	Warp Winding Machine	1
2.	Pirn Winder	1
3.	Plain loom with Dobby	1
4.	Handloom with jack & loom arrangement	1
5.	Drum Type/ sectional warping & Beaming machine	1
6.	Handloom with Jacquard	1
7.	Chittaranjan Semiautomatic Power Loom	1
8.	Hand Knotter, Splicer etc	1 each
9.	Shuttleless Repairloom	1