Skill India
कौशल भारत-कुशल भारत

SPINNING TECHNICIAN

NSQF LEVEL- 4.5

SECTOR- TEXTILE &HANDLOOM

COMPETENCY BASED CURRICULUM
CRAFT INSTRUCTOR TRAINING SCHEME (CITS)

सत्यमेव जयते

GOVERNMENT OF INDIA
Ministry of Skill Development & Entrepreneurship
Directorate General of Training
CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE
EN-81, Sector-V, Salt Lake City, Kolkata – 700091

Directorate General of Training

SPINNING TECHNICIAN

(Engineering Trade)

SECTOR –TEXTILE &HANDLOOM

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Version 2.1

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Developed By
Government of India
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Kolkata – 700 091
www.cstaricalcuta.gov.in

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1. COURSEOVERVIEW

The Craft Instructor Training Scheme is operational since inception of the Craftsmen Training Scheme. The first Craft Instructor Training Institute was established in 1948. Subsequently, 6 more institutes namely, Central Training Institute for Instructors (now called as National Skill Training Institute (NSTI)), NSTI at Ludhiana, Kanpur, Howrah, Mumbai, Chennai and Hyderabad were established in 1960's by DGT. Since then the CITS course is successfully running in all the NSTIs across India as well as in DGT affiliated institutes viz. Institutes for Training of Trainers (IToT). This is a competency based course for instructors of one year duration. "Spinning Technician" CITS trade is applicable for Instructors of "Spinning Technician" CTS Trade.

The main objective of Craft Instructor training programme is to enable Instructors explore different aspects of the techniques in pedagogy and transferring of hands-on skills so as to develop a pool of skilled manpower for industries, also leading to their career growth & benefiting society at large. Thus promoting a holistic learning experience where trainee acquires specialized knowledge, skills & develops attitude towards learning & contributing in vocational training ecosystem.

This course also enables the instructors to develop instructional skills for mentoring the trainees, engaging all trainees in learning process and managing effective utilization of resources. It emphasizes on the importance of collaborative learning & innovative ways of doing things. All trainees will be able to understand and interpret the course content in right perspective, so that they are engaged in & empowered by their learning experiences and above all, ensure quality delivery.

2. TRAINING SYSTEM

2.1 GENERAL

CITS courses are delivered in National Skill Training Institutes (NSTIs) & DGT affiliated institutes viz., Institutes for Training of Trainers (IToT). For detailed guidelines regarding admission on CITS, instructions issued by DGT from time to time are to be observed. Further complete admission details are made available on NIMI web portal http://www.nimionlineadmission.in.The course is of one-year duration. It consists of Trade Technology (Professional skills and Professional knowledge), Training Methodology and Engineering Technology/ Soft skills. After successful completion of the training programme, the trainees appear in All India Trade Test for Craft Instructor. The successful trainee is awarded NCIC certificate by DGT. With effect from the session starting August 2019, the validity of National Craft Instructor Certificate (NCIC) issued under Craft Instructor Training Scheme (CITS) shall be 5 years. During the fifth year after attaining NCIC certificate, the certificate holder shall be required to attend a refresher course of duration not less than 10 days. These refresher courses would be offered by NSTIs / short-listed partners.

2.2 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year:

S No.	Course Element	Notional Training Hours
1.	**Trade Technology**	
	Professional Skill (Trade Practical)	480
	Professional Knowledge (Trade Theory)	270
2.	**Training Methodology**	
	TM Practical	270
	TM Theory	180
	Total	**1200**

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

3	On the Job Training (OJT)/ Group Project	150
4	Optional Course	240

Trainees can also opt for optional courses of 240 hours duration.

2.3 PROGRESSION PATHWAYS

- Can join as Instructor in Vocational Training / Technical Institute and progress further as group instructor and Principal.
- Can join as a supervisor in textile Industries and progress up to manager.

2.4 ASSESSMENT & CERTIFICATION

The CITS trainee will be assessed for his/her Instructional skills, knowledge and attitude towards learning throughout the course span and also at the end of the training program.

a) The Continuous Assessment(Internal) during the period of training will be done by **Formative Assessment Method** to test competency of instructor with respect to assessment criteria set against each learning outcomes. The training institute has to maintain an individual trainee portfolio in line with assessment guidelines. 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 Method**. The All India Trade Test for awarding National Craft Instructor Certificate will be conducted by DGT at the end of the yearas per the guidelines of DGT. The learning outcome and assessment criteria will be the basis for setting question papers for final assessment**.** The external examiner during final examination will also check the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

2.4.1 PASS CRITERIA

Allotment of Marks among the subjects for Examination
The minimum pass percent for Trade Practical, TM practical Examinations and Formative assessment is 60% & for all other subjects is 40%.There will be no Grace marks.

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. While assessing, the major factors to be considered are approaches to generate solutions to specific problems by involving standard/non-standard practices.

Due consideration should also 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 of the following:

- Demonstration of Instructional Skills (Lesson Plan, Demonstration Plan)
- Record book/daily diary
- Assessment Sheet
- Progress chart

- Video Recording
- Attendance and punctuality
- Viva-voce
- Practical work done/Models
- Assignments
- Project work

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

Performance Level	Evidence
(a) Weightage in the range of 60%-75% to be allotted during assessment	
For performance in this grade, the candidate should be well versed with instructional design, implement learning programme and assess learners which demonstrates attainment of an ***acceptable standard*** of crafts instructorship with ***occasional*** **guidance** and engage students by demonstrating good attributes of a trainer.	• Demonstration of ***fairly good*** skill to establish a rapport with audience, presentation in orderly manner and establish as an expert in the field. • Average engagement of students for learning and achievement of goals while undertaking the training on specific topic. • A fairly good level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Occasional support in imparting effective training.
(b) Weightage in the range of 75%-90% to be allotted during assessment	
For performance in this grade, the candidate should be well versed with instructional design, implement learning programme and assess learners which demonstrates attainment of a***reasonablestandard*** of crafts instructorship with ***little*** **guidance** and engage students by demonstrating good attributes of a trainer.	• Demonstration of ***good*** skill to establish a rapport with audience, presentation in orderly manner and establish as an expert in the field. • Above average engagement of students for learning and achievement of goals while undertaking the training on specific topic. • A***good*** level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Little support in imparting effective training.
(c) Weightage in the range of more than 90% to be allotted during assessment	
For performance in this grade, the candidate should be well versed with instructional design, implement learning	• Demonstration of ***high*** skill level to establish a rapport with audience, presentation in orderly manner and

programme and assess learners which demonstrates attainment of a***high standard*** of crafts instructorship with ***minimal or no support*** and engage students by demonstrating good attributes of a trainer.	establish as an expert in the field. • Good engagement of students for learning and achievement of goals while undertaking the training on specific topic. • A ***high*** level of competency in expressing each concept in terms the student can relate, draw analogy and summarize the entire lesson. • Minimal or no support in imparting effective training.

3. GENERAL INFORMATION

Name of the Trade	**SPINNING TECHNICIAN-CITS**
Trade Code	DGT/4050
NCO – 2015	2356.0100, 2141.1400
NOS Covered	TSC/N9427, TSC/N9418, TSC/N9419, TSC/N9420, TSC/N9421, TSC/N9422, TSC/N9425, TSC/N9426, TSC/N9423, TSC/N9424, ASC/N9410, ASC/N9411
NSQF Level	Level-4.5
Duration of Craft Instructor Training	One Year
Unit Strength (No. Of Student)	25
Entry Qualification	B.Voc/ Degree in Textile Technology/ Spinning Technology from AICTE/ UGC recognized Engineering College/ University. OR 03 yrs. Diploma in Textile Technology after class 10th from AICTE/ recognized board of technical education. OR Ex-serviceman from Indian Armed forces with 15 years of service in related field as per equivalency through DGR. OR 10th Class with 2 year NTC/NAC passed in Spinning Technician.
Minimum Age	16 years as on first day of academic session.
Space Norms	525 Sq. m
Power Norms	9.4 KW
Instructors Qualification for	
1. Spinning Technician -CITS Trade	B.Voc/Degree in Textile Technology/ Spinning Technology from AICTE/UGC recognized University with two years experience in relevant field. OR 03 years Diploma in Textile Technology from AICTE/recognized University/ board with five years experience in relevant field. OR Ex-serviceman from Indian Armed forces with 15 years of service in related filed as per equivalency through DGR. Candidate should have undergone methods of instruction course or minimum 02 years of experience in technical training institute of Indian armed forces. OR NTC/ NAC passed in Spinning Technician trade with seven years experience in relevant field. Essential Qualification:

	National Craft Instructor Certificate (NCIC) in Spinning Technician trade, in any of the variants under DGT.
2. Workshop Calculation & Science	B.Voc/Degree in any Engineering from AICTE/ UGC recognized Engineering College/ university with two years experience in relevant field. OR 03 years Diploma in Engineering from AICTE /recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with five years' experience in the relevant field. OR NTC/ NAC in any Engineering trade with seven years experience in relevant field. **Essential:** National Craft Instructor Certificate (NCIC) in relevant trade OR 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 two years experience in relevant field. OR 03 years Diploma in Engineering from AICTE /recognized board of technical education or relevant Advanced Diploma (Vocational) from DGT with five 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 seven years experience. **Essential Qualification:** National Craft Instructor Certificate (NCIC) in relevant trade OR NCIC in RoDA / D'man (Mech /civil) or any of its variants under DGT
4. Training Methodology	B.Voc/Degree in any discipline from AICTE/ UGC recognized College/ university with two years experience in training/ teaching field. OR Diploma in any discipline from recognized board / University with five years experience in training/teaching field. OR NTC/ NAC passed in any trade with seven years experience in training/ teaching field. **Essential Qualification:** National Craft Instructor Certificate (NCIC) in any of the variants under DGT / B.Ed /ToT from NITTTR or equivalent.
5. Minimum Age for Instructor	21 Years

4. JOB ROLE

Brief description of job roles:

Manual Training Teacher/Craft Instructor; instructs students in ITIs/VocationalTraining Institutes in respective trades as per defined job role. Imparts theoretical instructions for the use of tools & equipment of related trades and related subjects. Demonstrate process and operations related to the trade in the workshop; supervises, assesses and evaluates students in their practical work. Ensures availability & proper functioning of equipment and tools in stores.

Spinning Master; organizes, controls and supervises spinning of cotton, calendaring and process preparatory to spinning. Ensures that required degree of temperature and humidity in various spinning 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.

Reference NCO 2015:

a) 2356.0100 – Manual Training Teacher/ Craft Instructor.
b) 2141.1400 – Spinning Master

Reference NOS:

a) TSC/N9427
b) TSC/N9418
c) TSC/N9419
d) TSC/N9420
e) TSC/N9421
f) TSC/N9422
g) TSC/N9425
h) TSC/N9426
i) TSC/N9423
j) TSC/N9424
k) ASC/N9410
l) ASC/N9411

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 TRADE TECHNOLOGY

1. Ensure implementation of safe working practices, environment regulation and housekeeping. (NOS: TSC/N9427)
2. Run & Observe the Ginning machine adjust the speed of opening roller and set the important settings in ginning machine. (NOS: TSC/N9418)
3. Plan and Maintain the Blow Room machineries, setting of various parts of the opening roller, cleaning roller and check the speed of the machines in blow room line and Run the auxiliary blow room machines. (NOS: TSC/N9419)
4. Demonstrate defects in blow room laps, causes and remedial measures. (NOS: TSC/N9419)
5. Assess various parts of carding machine and know their functions. (NOS: TSC/N9420)
6. Demonstrate maintenance of the carding machine and setting of various parts of the carding machine. (NOS: TSC/N9420)
7. Plan and select of the card clothing based on the type of fiber processed. (TSC/N9403)
8. Select & troubleshoot the various components in comber preparatory and comber machines. (NOS: TSC/N9421)
9. Set & run the speed frame machine and ring frame machine using proper tools and gauges and perform maintenance activities. (NOS: TSC/N9422)
10. Plan &maintain and Set the splicer and check the functioning of splicer. (NOS: TSC/N9422)
11. Analyse the functions of overhead clearer and perform its maintenance. (NOS: TSC/N9425)
12. Plan and record the Routine and Preventive Maintenance. (NOS: TSC/N9426)
13. Demonstrate the functions of various parts in rotor spinning machine. Perform the maintenance activities in rotor spinning machine. (NOS: TSC/N9423)
14. Demonstrate maintenance activities in air spinning machine and DREF spinning machine. (NOS: TSC/N9423)
15. Inspect &perform the maintenance activities in TFO and Ring Doublers. (NOS: TSC/N9424)
16. Plan& apply QA system in textile industry. (NOS: TSC/N9424)
17. Read and apply engineering drawing for different application in the field of work. (NOS:ASC/N9410)
18. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS:ASC/N9411)

6. COURSE CONTENT

SPINNING TECHNICIAN–CITS TRADE			
TRADE TECHNOLOGY			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical)**	**Professional Knowledge (Trade Theory)**
Practical 10 Hrs Theory 05 Hrs	Ensure implementation of safe working practices, environment regulation and housekeeping.	**Safety Practices** 1. Demonstrate fires in electrical Circuits & Precautions. 2. Identify fire extinguishers & its types, General Safety of Tools & Equipment. 3. Rescue a person who is in contact with live wire and treat a person for electric shock/ injury.	Fire Fighting. Safely handling Tools & Equipment. Use of proper Tools & Equipment & its maintenance. Rescue of person who is in contact with live wire. Treat a person for electric shock/ injury.
Practical 10 Hrs Theory 05 Hrs	Run & Observe the Ginning machine, adjust the speed of opening roller and set the important settings in ginning machine.	4. Adjust speed and setting parameters of ginning. 5. Identify the parts of the ginning machine and their functions. 6. Carry out the important settings and adjust the setting. 7. Adjust the speed of the rotating components in ginning machine. 8. Carry out the maintenance activity as per schedule.	**Ginning:** Introduction to Ginning, Objectives of Ginning - types of ginning, types machines in ginning, setting parameters &process control in ginning. Blending & Mixing – Types &Equipment.
Practical 110 Hrs Theory 40 Hrs	Plan and Maintain the Blow Room machineries, setting of various parts of the opening roller, cleaning roller and check the speed of the machines in blow room line and Run	9. Carry out the important settings and adjust the settings of various machines in blow room. 10. Adjust the speed of the rotating components in blow room. 11. Maintain the chute feed system.	**Blow room:** Objectives of Blow room process –Principle of Opening and Cleaning - Opening and cleaning machines: Hopper Bale Breaker, Hopper feeder, Step cleaner,Axiflow cleaner, Mono cylinder, ERMcleaner, Porcupine opener, 3 bladed

	the auxiliary blow room machines.	12. Carry out duct setting in chute feed system. 13. Centrifugal tension condition for maximum power transmission and speed. 14. Maintenance schedule of the Blow room Machineries. 15. Setting of various parts of the opening roller, cleaning roller and speed checkup. 16. Cleaning check up of the machine parts with general checklist. 17. Motor pulley, machines pulley fitting and belt alignment of various machines. 18. Compressor and air pressure check up.	beaters, Kirschner beater, Salient features of Mixers and bale plucker. Maintenance schedule of the Blow room machineries. Setting of various parts of the opening roller, cleaning roller and speed checkup. Motor pulley, machine pulley fitting and belt alignments of various machines. Greasing of bearing, types of greases. Greasing techniques to various bearings in the Blow room machinery.
		19. Identify the various auxiliary machines of blow room machine and their functions. 20. Function and maintenance of cage, condenser, grid bars, metal detector, limit switches and Photocell alignment in mixing machines. 21. Carry out the important settings and adjust the settings of auxiliary machines in blow room. 22. Adjust the speed of the rotating components in auxiliary machines. 23. Carry out the maintenance activity as per schedule.	**Auxiliary blow room machines:** Cages, pneumatic conveyors, condenser, distributors, dust extractor, Automatic Waste Evacuation System (AWES), rotary filters, cellar less blow room, filter bags, contaminator eliminator, metal detectors & Fire Diverters. Function of Two-way distributor, Bye-pass arrangement of material flow.
Practical 20 Hrs Theory	Demonstrate defects in blow room laps, causes and remedial measures.	24. Check up of various parts of the machines with standard setting. 25. Carry out maintenance	**Trouble shooting problems in Blowroom:** Lap c.v% control technique, Onemeter lap c.v%, Chute feed system;

10Hrs		activity on PIV gears. 26. Analyze drives of various parts of the scutcher. 27. Maintenance of chutefeed line.	Introduction to Chute feed system, Maintenance of chute feed systems: flockfeeder, flock meter.Duct setting,. Function of photocell inchute feed.
Practical 20 Hrs Theory 10Hrs	Assess various parts of carding machine and know their functions.	28. Manufacturers of carding machine, various models, Passage of material through carding machine. 29. Various parts of the carding machine. Wire specification for processing cotton, synthetic and blends. 30. Heel and toe mechanism. Waste control. 31. Effect of licker in, cylinder, flat and doffer speed on web quality.	**Carding Department:** Introduction to carding, Objects and Principles of Carding. Functions of carding machines, Passage of material through carding machine. Wire specification for processing cotton, synthetic and blends. Heel and toe mechanism. Waste control. Effect of lick cylinder, flat and doffer speed on web quality.
Practical 20 Hrs Theory 10Hrs	Demonstrate maintenance of the carding machine and setting of various parts of the carding machine.	32. Maintenance schedule of the carding department. 33. Motor plate alignment and setting. 34. Motor pulley and machine pulley alignment, flat belt setting. 35. Checklist of General cleaning of the card. 36. Setting of various parts of the machine. 37. Leaf gauge, Allen key, and toolbox. 38. Wire mounting: Cylinder, doffer, licker in and flat strip. 39. Wire specification details. 40. Machine leveling check-up.	**Maintenance schedule of the carding department**: Motor plate alignment and setting. Motor pulley and machine pulley alignment, flat belt setting. Overhauling of coiler mechanism General cleaning of carding machine, Gearing diagram, speed particulars and technical data, greasing & oiling parts. Wire mounting: Cylinder, doffer, licker in and flat strip. Wire specification details. Machine leveling checkup.
Practical 20 Hrs Theory 10Hrs	Plan and select of the card clothing based on the type of fiber processed.	41. Overhauling of coiler mechanism, Selection of card clothing for cotton, synthetic, blends. 42. Auto leveller functions, setting and maintenance.	Salient features on new generation cards, feed zone integrated feed plate, senso feed, unifeed, precarding, segment, carding zone, integrated grinding system,

		43. Selection of card clothing for cotton, synthetic blends. 44. Half setting, Full setting, Grinding operation, stripping operation. 45. Flat grinding, under casing setting & polishing. 46. Web doffing unit servicing coiler unit servicing. 47. Analysis of machine speed & setting wire point.	flat measuring system. Automation in cards. Study of Apron Web doffing device. Brief study of auto leveler. Dust extraction system in card - Automatic Waste Evacuation System (AWES).Half setting, Full setting, Grinding operation, stripping operation. Stationary flat change. Flat grinding, under casing setting & polishing Change gears: Draft, production, tensions, coiler and can-changer. Troubleshooting techniques: Control of neps generation, flat stripping waste, licker in dropping, and cylinder dropping.
Practical 40 Hrs Theory 20 Hrs	Select & troubleshoot the various components in comber preparatory and comber machines.	48. Checklist during general cleaning. 49. Head stock overhauling, Draft gear overhauling. 50. Coiler mechanism overhauling, re-needling of half comb. 51. Inching motion, index wheel setting, cost buffing techniques, detaching roller setting & buffing. 52. Trouble sheeting: Piecing index setting, oil level setting: head to heat, Overall machine. 53. Unicom, draw box drafting auto motion in comber.	**Comber Department:** Maintenance schedule of the comber preparatory machines and comber. General cleaning of a comber. Head stock overhauling, Draft gear overhauling. Coiler mechanism overhauling, re needling of half comb. Inching motion, index wheel setting, cots buffing techniques, detaching roller setting & buffing. Trouble shooting: Piecing index setting, oil level setting: head to heat, Overall machine. Salient features of new generation, preparatory machines and combers.
Practical 110 Hrs Theory 40 Hrs	Set & run the speed frame machine and ring frame machine using proper tools and gauges and	54. Function of various parts of the simplex machine, material passage, stop motion switches, motor plate alignment, setting of	**Speed Frame Machine**:Introduction to simplex, Objects of Speed frame, function of various parts of the machine, passage

	perform maintenance activities.	belts, cots buffing, inching motion, creel guide roller check-up& oiling, photo sensor setting. 55. Maintenance schedule of the simplex machine. 56. Headstock overhauling, draft gear overhauling, draft roller setting, top arm pressure gauge& saddle gauge, needle bearing greasing. 57. Flyers, spindles, builder motion, differential motions, cone drums, process Parameter. 58. Bobbin rail leveling, differential box oiling & noise check up, builder motion overhauling flyer alignment, false twister types, spacer & condenser, creel drafting systems, suspended flyers, differential and builder mechanisms.	of material, stop motion switches, motor plate alignment, setting of belt cots buffing, inching motion, creel guide roller checkup & oiling, photo sensor settings. Maintenance schedule of the simplex machine. Headstock overhauling, draft gear overhauling, draft roller setting, top arm pressure gauge & saddle gauge, needle bearing greasing.
		59. Checklist for general cleaning of the machine, Needle bearing greasing, lappet Gauge, tin roller bearing check-up & change. 60. Machine leveling, change gear replacement: draft, twist, ratchet, break draft change gear. Creel alignment (bobbin holder setting), top roller buffing, idle spindle rectification work. Over head cleaner, auto doffing, dual drive motor Spindle oil replenishing, greasing of top roller & jockey pulley,	**General study ofring frame:** gearing end -off end, gears, spur gears, helical gear bearings. Spindle oil replenishing, greasing of top roller & jockey pulley, traveler clearer setting, traveler change, and Jockey pulley setting. Common defects in ring spun yarns, causes and remedies. Causes of end breakages in ring frame. Salient features of new generation ring frame. Creel, drafting systems, apron specifications & automatic

		traveller clearer setting, traveller change, and Jockey setting. 61. Design of Ring frame builder motion cam. 62. Hi-speed rings and spindles travellers. Auto doffing, improved driving systems, Automation in ring frame. Introduction of various Spinning Systems For diversified products.	doffing systems. Study of Compact Spinning System.
Practical 20 Hrs Theory 10Hrs	Plan &maintain and Set the splicer and check the functioning of splicer.	63. Splicer: mechanical setting and air adjustment. Knife blade setting, balloon breaker setting. 64. Cone holder setting, package dia setting gauge, length measuring motion setup.	**Splicer:**Mechanical setting and air adjustment. Knife blade setting, balloon breaker setting. Cone holder setting, package dia setting gauge, length measuring motion setup.
Practical 20 Hrs Theory 10Hrs	Analyzethe functions of Overhead clearer and perform its maintenance.	65. Overhead clearer check up, speed adjustment, rail track check up. 66. Mechanical setting of individual drive to all parts of the machine: slab catcher, winding drum, splicer setting, EYC checking, yarn guide groove formation checking.	Overhead clearer check up, speed adjustment, rail track check up. Mechanical setting of individual drive to all parts of the machine: slab catcher, winding drum, splicer setting, EYC checking, yarn guide groove formation checking.
Practical 20 Hrs Theory 10Hrs	Plan and record the Routine and Preventive Maintenance.	67. Routine and Preventive Maintenance. 68. Procedure of Maintenance. 69. Equipment history records, inventory control, preventive maintenance checklist, machinery audit check points. 70. Application of mechanic tools, machinery erection, modernization.	**Maintenance of spinning machinery:** Routine and Preventive Maintenance. Maintenance Program. Procedure of Maintenance. Equipment history records, inventory control, preventive maintenance checklist, machinery audit check points.
Practical 10 Hrs	Demonstrate the functions of various	71. Maintenance activities in rotor spinning machine.	**Modern Spinning Technology**: Rotor Spinning (OE):

Theory 05 Hrs	parts in rotor spinning machine. Perform the maintenance activities in rotor spinning machine.	72. Functions of feed roll, rotor box, rotor, opening roller, feed roller, navel, stop motion, traverse guide, auto doff and auto piece etc. 73. Driving system suction and filter unit-basic settings machine speed particulars and technical data cleaning schedule and maintenance schedule.	Introduction: Rotor spinning, material passage. Wire specifying opening roller for cotton, synthetic and blends, Rotor design, navel design, take up and package from mechanism. Drive mechanism: Feeding. Opening roller, rotor, take-up and yarn traversing.
Practical 20 Hrs Theory 10Hrs	Demonstrate maintenance activities in air spinning machine and DREF spinning machine.	74. Adjust the speed of the rotating components. 75. Maintain the various parts of the machine. 76. Carry out the cleaning activities of the parts. 77. Check the yarn traverse setting.	**Air jet Spinning:** Introduction to Air jet spinning, working of various parts of the machine: creel, drafting system, twisting mechanism, winding. Working of air jet nozzle and setting of nozzle with other parts, air pressure adjustment. Yarn traverse setting, winding package hardness, change places of various areas in air jet spinning control panel setting.
		78. Identify the working of various parts of the machine. 79. Identify the important setting points and carry out. 80. Adjust the speed of the rotating components. 81. Maintain the various parts of the machine. 82. Carry out the cleaning activities of the parts.	**DREF Spinning:** Introduction to Dref spinning, function of various parts of the machines: creel, drafting system, twisting mechanism, winding. Working of drum with parts, yarn withdrawal.
Practical 20 Hrs Theory 10Hrs	Inspect & perform the maintenance activities in TFO and Ring Doublers.	83. Head stock overhauling, traverse motion, winding drum, twisting assembly, spindle oiling and tension adjustment. 84. Function of change gears:	**Two For One twister (TFO):** Introduction to two for one twister, functions of various parts-machine speed set up &technical data-cleaning schedule and maintenance

		Twist change gear, production change gear, and traverse change gear and tension adjustment.	schedule.
		85. Introduction to ring doublers, types, creel, roller arrangement, rings, spindles, travellers, packages, and builder motions. 86. Maintenance of machine: overhauling of headstock, spindle oiling, ring cantering, ring rail leveling.	**Ring Doublers:** Introduction to ring doublers, types, creel, roller arrangement, rings, spindles, travelers, packages, and builder motions Maintenance of machine: overhauling of headstock spindle oiling, ring centering, ring rail leveling.
Practical 10 Hrs Theory 05 Hrs	Plan& apply QA system in textile industry.	87. Familiarization to QA Systems: Visit to Companies, which have ISO 9000certification. Concept of fabric quality.	**Quality Assurance:** Concepts of quality, Control and Assurance. Introduction to ISO 9001-2000, ISO 14001-2004 & SA 8000 systems, OHSAS-18001-1999. Testing of fabric Quality.
Engineering Drawing: 30 Hrs.			
Professional Knowledge ED- 30 Hrs.	Read and apply engineering drawing for different application in the field of work.	**Engineering Drawing:** • Reading of drawing of nuts, bolt, screw thread, different types of locking devices e.g., Double nut, Castle nut, Pin, etc. • Reading of foundation drawing • Reading of Rivets and riveted joints, welded joints • Reading of drawing of pipes and pipe joints • Reading of Job Drawing, Sectional View & Assembly view	
WORKSHOP CALCULATION & SCIENCE: 30 Hrs.			
Professional Knowledge WCS- 30 Hrs.	Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study.	**WORKSHOP CALCULATION & SCIENCE:** **Friction** Friction - Advantages and disadvantages, Laws of friction, co-efficient of friction, angle of friction, simple problems related to friction Friction - Lubrication Friction - Co- efficient of friction, application and effects of friction in workshop practice **Centre of Gravity** Centre of gravity - Centre of gravity and its practical application **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	

		Area of irregular surfaces and application related to shop problems **Elasticity** Elasticity - Elastic, plastic materials, stress, strain and their units and young's modulus Elasticity - Ultimate stress and working stress **Heat Treatment** Heat treatment and advantages Heat treatment - Different heat treatment process – Hardening, tempering, annealing, normalising and case hardening **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

SYLLABUS FORCORE SKILLS
1. Training Methodology (Common for all trades) (270Hrs + 180Hrs)

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

7. ASSESSMENT CRITERIA

LEARNING OUTCOME	ASSESSMENT CRITERIA
TRADE TECHNOLOGY	
1. Ensure implementation of safe working practices, environment regulation and housekeeping. (NOS: TSC/N9427)	Explain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	Check and report all unsafe situations according to site policy.
	Demonstrate necessary precautions on fire and safety hazards and report according to site policy and procedures.
	Classify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	Evaluate and observe site policies and procedures in regard to illness or accident.
	Demonstrate basic first aid and use them under different circumstances
	Explain different fire extinguisher and use the same as per requirement.
2. Run & Observe the ginning machine, adjust the speed of opening roller and set the important settings in ginning machine. (NOS: TSC/N9418)	Identify the parts of the ginning machine and their functions.
	Carry out the important settings and adjust the settings.
	Adjust the speed of the rotating components in ginning machine.
	Carry out the maintenance activity as per schedule.
	Observe & control the running condition of machine.
3. Plan and Maintain the Blow Room machineries, setting of various parts of the opening roller, cleaning roller and check the speed of the machines in blow room line and Run the auxiliary blow room machines. (NOS: TSC/N9419)	Identify the parts of blow room machine and their functions.
	Carry out the important settings and adjust the settings of various machines in blow room.
	Adjust the speed of the rotating components in blow room.
	Maintain the chute feed system.
	Carry out duct setting in chute feed system.
	Carry out the maintenance activity as per schedule.
	Observe & control the running condition of machine.
	Identify the various auxiliary machines of blow room machine and their functions.
	Carry out the important settings and adjust the settings of auxiliary machines in blow room.
	Adjust the speed of the rotating components in auxiliary machines.
	Carry out the maintenance activity as per schedule.
	Demonstrate the running of machine.

4. Demonstrate defects in blow room laps, causes and remedial measures. (NOS: TSC/N9419)	Plan the activity.
	Carry out maintenance activity on PIV gears.
	Analyze drives of various parts of the scutcher.
	Carry out the top and bottom cone drum setting.
	Check the function of piano feed regulating motion, rack motion and length measuring motion.
	Check the pressure and identify air pressure requirement of various parts of the blow room.
5. Assess various parts of carding machine and know their functions. (NOS: TSC/N9420)	Plan the part layout of carding machine.
	Identify various parts in carding machine and identify their functions.
	Piece the broken slivers.
	Doff the sliver can.
	Remove the licker-in, cylinder and doffer wastes.
	Clean the flat strips. Clean clearer roller wastes.
6. Demonstrate maintenance of the carding machine and setting of various parts of the carding machine. (NOS: TSC/N9420)	Carry out Motor plate alignment and setting.
	Carry out Motor pulley and machine pulley alignment, flat belt setting.
	Identify various oiling and greasing parts and carry out the lubrication.
	Overhaul the coiler mechanism.
	Carryout the maintenance activity as per schedule.
7. Plan and select of the card clothing based on the type of fiber processed. (NOS: TSC/N9403)	Identify the wire specifications for processing cotton and different blends.
	Carry out wire mounting of cylinder, doffer and licker in
	Carry out flat wire grinding.
	Check up the level of the carding and carry out machine leveling.
8. Select & troubleshoot the various components in comber preparatory and comber machines. (NOS: TSC/N9421)	Set the bottom roll setting.
	Set the top roll setting, top roll pressure, calendar roll, nipper setting, Index wheel, detaching roll, fleece guide, safety door sensor, top comb, noil setting, piecing index.
	Clean the detach roller and the top comb.
	Overhaul headstock, coiler and draft gear.
	Re-needle unicomb.
	Buff the cots.
9. Set & run the speed frame machine and ring frame machine using proper tools and gauges and perform maintenance activities. (NOS: TSC/N9422)	**Speed Frame machine:**
	Check creel stop motion. Demonstrate cots buffing. Check pneumafil fan suction. Select proper guides as per sliver hank. Set the bottom roll clearer cloth and gear play. Demonstrate gear change. Overhaul headstock. Overhaul draft gear.
	Set the bottom roll setting and top roll setting.
	Set the top roll pressure scan roll, belt tension, timer and calendar

	roll.
	Overhaul draft gear and coiler head.
	Check the timer belt and working of stop motion.
	Check top roller pressure.
	Demonstrate greasing of bearings.
	Demonstrate the trueing of bottom roller.
	Set the roving stop motion sensor.
	Set the sliver stop motion sensor.
	Demonstrate flyer alignment.
	Overhaul of builder motion.
	Set the cone drum belt position.
	Overhaul differential gear box.
	Set the ratchet wheel.
	Check the pneumatic valves.
	Check the dead weight on bobbin rail.
	Ring frame machine:
	Select proper roving guides as per roving hank.
	Set the roving guide bar height, top roll setting,top roll pressure.
	Set the bottom roll setting.
	Demonstrate ring centering, machine levelling. Set the traveller clearer.
	Overhaul headstock, draft gear
	Demonstrate greasing of bearings. Buff the cots, trueing of bottom roller.
	Check ring rail leveling, replenish spindle oil.
	Grease the bottom roller needle bearing.
	Demonstrate spindle tape joining, creel alignment.
	Change the twist wheel,total draft and break draft change wheel.
	Set lappet gauge.
	Demonstrate top roller greasing.
	Set the jockey pulley for spindle tape tension.
10. Plan &maintain and Set the splicer and check the functioning of splicer. (NOS: TSC/N9422)	Check and adjust the splicer parts.
	Check and adjust the air level in splicer,splicing techniques.
	Check and adjust the mechanical setting and air. Knife breaker setting.
	Check and adjust Knife setting and air blade setting.
	Check and adjust the balloon adjustment.
	Check and adjust the Cone blade setting, balloon holder setting.
	Check and adjust package dia setting.
	Check and adjust Cone gauge, length measuring holder.
	Check length measuring motion &set.
11. Analyse the functions of Overhead clearer and perform its maintenance. (NOS: TSC/N9425)	Clean the Overhead clearer.
	Check and adjust Overhead clearer, rail track check up.
	Check and carry out mechanical adjustment.
	Setting of individual drive to all.

	Check and set drive to all parts.
	Check and adjust the speed of the parts in overhead clearer.
12. Plan and record the Routine and Preventive Maintenance. (NOS: TSC/N9426)	Make the Equipment history and maintain.
	Prepare the inventory records and follow.
	Carry out the inventory control.
	Prepare the maintenance check list and maintain.
	Prepare the machine audit, machine tool applications.
13. Demonstrate the functions of various parts in rotor spinning machine. Perform the maintenance activities in rotor spinning machine. (NOS: TSC/N9423)	Check and adjust the driving system suction.
	Check and adjust the filter unit-basic settings.
	Clean the various parts of the machine.
	Set the rotor box, rotor, opening roller.
	Check and set the stop motion.
	Check and adjust the auto doff and auto piece.
	Check and set the navel.
	Check and set the traverse guide.
14. Demonstrate maintenance activities in air spinning machine and DREF spinning machine. (NOS: TSC/N9423)	Adjust the speed of the rotating components.
	Maintain the various parts of the machine.
	Carry out the cleaning activities of the parts.
	Check the yarn traverse setting.
15. Inspect & perform the maintenance activities in TFO andRing Doublers. (NOS: TSC/N9424)	Adjust the speed of the rotating components.
	Maintain the various parts of the machine.
	Carry out the cleaning activities of the parts.
16. Plan& apply QA system in textile industry. (NOS: TSC/N9424)	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.
17. Read and apply engineering drawings for different applications in the field of work. (NOS: ASC/N9410)	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.
18. Demonstrate basic mathematical concepts and principles to perform practical operations. Understand and	Solve different mathematical problems
	Explain concept of basic science related to the field of study

explain basic science in the field of study. (NOS: ASC/N9411)	

8. INFRASTRUCTURE

LIST OF TOOLS AND EQUIPMENT FOR SPINNING TECHNICIAN(CITS)			
For batch of 25 candidates			
S No.	**Name of the Tool & Equipment**	**Specification**	**Quantity**
A. TRAINEES TOOL KIT			
1.	Combination Plier	200 mm insulated	26 (25+1) Nos.
2.	Screw Driver	200 mm	26 (25+1) Nos.
3.	Screw Driver	100 mm	26 (25+1) Nos.
4.	Hammer Ball Peen	0.25 kg	26 (25+1) Nos.
5.	Neon Tester		26 (25+1) Nos.
6.	Steel Rule	300mm to read Metric	26 (25+1) Nos.
7.	Test lamp		26 (25+1) Nos.
8.	Circlip Opener		26 (25+1) Nos.
9.	Continuity Tester		26 (25+1) Nos.
10.	Insulating Tape		26 (25+1) Nos.
11.	D.E. Spanner set of 10		26 (25+1) Nos.
B. INSTRUMENT AND GENERAL SHOP OUTFIT			
12.	Pliers side cutting	200 mm	6 Nos.
13.	Pliers flat nose	150 mm	6 Nos.
14.	Pliers round nose		6 Nos.
15.	Pliers long nose		6 Nos.
16.	Screw driver heavy duty	250 mm	5 Nos.
17.	Screw driver	7 mm x 300 mm square blade	6 Nos.
18.	Hammer Ball Peen	1 Kg	5 Nos.
19.	Allen keys Metric & Inches		
20.	Bench vice	150 mm	3 Nos.
21.	Bench vice	100 mm	2 Nos.
22.	Hacksaw frame Adjustable	200 mm to 300 mm	5 Nos.
23.	Steel Measuring Tape	2m	5 Nos.
24.	Steel Measuring Tape	20 m	2 Nos.
25.	Ring spanner		
26.	Puller	2 arm, 3 arm 3 each	
27.	Vernier Caliper		
28.	Nylon hammer		
29.	Pipe Wrench	300 mm	10 Nos.
C. MACHINERIES			
30.	Blow room (Miniature)		1 No.
31.	Carding (Miniature)		1 No.
32.	Draw frame (Miniature)		1 No.
33.	Simplex (Miniature)		1 No.

34.	Ring frame		1 No.
35.	TFO (Miniature)		1 No.
36.	Rotor spinning machine (miniature)		1 No.
37.	Winding machine (miniature)		1 No.
38.	Classimat/classifault system		1 No.
D. GENERAL INSTALLATIONS			
39.	Work bench	250x120x75 with four vices of 12.5 cm	1 No.
40.	Locker with 8 drawers (Standard size)		3 Nos.
41.	Metal Rack	180x150x45cm.	2 Nos.
42.	Steel almirah/ cupboard		1 No.
43.	Black board and easel		1 No.
44.	Instructor's Desk or table		1 No.
45.	Chair		1 No.
46.	Machine leveling gauge (Spirit level)		1 No.
47.	Greasing pump		1 No.
48.	Spindle oil lubricating machine		1 No.
49.	Roll trueing machine		1 No.
50.	Pressure gauge		1 No.
51.	Machine pulley adopter assembly	3Arm, 4Arm type	1 No.
52.	Cots buffing machine.		1 No.
53.	Tachometer		1 No.
54.	Tensionometer		1 No.
55.	Computer	CPU: 32/64 Bit i3/i5/i7 or latest processor, Speed: 3 GHz or Higher. RAM:-4 GB DDR-III or Higher, Wi-Fi Enabled. Network Card: Integrated Gigabit Ethernet, with USB Mouse, USB Keyboard and Monitor (Min. 17 Inch.) Licensed Operating System and Antivirus compatible with trade related software.	1 No.
56.	Laser Printer		1 No.

Note: - 1. All the tools and equipment are to be procured as per BIS specification.


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