

**Syllabus For Jute Spinning, Twisting & Winding Technician**

<b>Course Name</b>	Jute Spinning, Twisting & Winding Technician
<b>Sector</b>	Textiles & Handlooms
<b>Course Code</b>	STC-TXT/2023/3703
<b>Level</b>	4
<b>Occupation</b>	Jute Spinning, Twisting & Winding Technician
<b>Job Description</b>	<p>Jute Spinning, Twisting &amp; Winding Technician plays a very important role in :</p> <ul style="list-style-type: none"> <li>-Identify critical machine parts and its functions and speed ratios of Jute Spinning, Twisting and Winding machines</li> <li>- Calculate draft &amp; draft constant and twist &amp; twist constant for jute spinning machine</li> <li>-Monitor and adjust machine settings to optimize yarn production efficiency and consistency.</li> <li>- Explain Testing and Quality Control of yarn quality</li> <li>- Measures various Statistical Quality Control parameters like mean, standard deviation, CV%, PMD etc, and related standards using Spread sheet / App</li> </ul>
<b>Course Duration</b>	Total Duration 450 Hrs (T- 150, P- 90 , OJT-150 and ES-60)
<b>Trainees' Entry Qualification</b>	<p>Grade 12 – Regular OR Vocational OR 10th grade pass plus 2-year NTC/NAC OR Completed 2nd year of 3-year diploma (after 10th) and pursuing regular diploma OR 10th grade pass and pursuing continuous schooling OR 10th grade pass with 2 years experience OR Previous relevant Qualification of NSQF Level 3.0 with minimum education as 8th Grade pass</p>
<b>Trainers Qualification</b>	<p>Diploma in Jute Technology / Post Graduate Diploma in Jute Technology and Management/ Diploma in Textile Technology/ Textile Engineering with 3 years experience in the relevant field OR/ B.Tech in Jute Technology / B.Tech in Textile Technology/ Textile Engineering with 2 years experience in the relevant field</p>

Structure of Course:

Module No.	Module name	Outcome	Compulsory/ Optional	Theory (Hrs)	Practical (Hrs)	OJT (Hrs.)	Total (Hrs) [Multiple of 30]
1	Fire and industrial safety management	Maintain health, safety and security at work place	Compulsory	10	20		30
2	Jute Spinning, Twisting and Winding machines	Supervise for quality adherence spinning and Winding section with minimum wastage.	Compulsory	40	20		60
3	Check for draft (& draft constant) and twist (& twist constant) regularly	Calculate & keep check for draft (& draft constant) and twist (& twist constant) regularly.	Compulsory	20	10		30
4	Concept about the man machine ratio and hands complements.	Evaluate production balancing and allocate of manpower as per requirements.	Compulsory	20	10		30
5	Quality control of Jute Silver & Yarn quality	Collect & test sample for quality control of Jute Silver & Yarn quality	Compulsory	40	20		60
6	Basic Computer Skill	Measure Statistical Quality Control parameters like mean, standard deviation, CV%, PMD etc, and related standards using spread	Compulsory	20	10		30
7	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Compulsory	--	--	150	150
8	Employability	As per guided	Compulsory	60	--		60

	<b>Skill</b>	curriculum					
<b>TOTAL:</b>				<b>210</b>	<b>90</b>	<b>150</b>	<b>450</b>

**SYLLABUS:****Module No 1: Fire and industrial safety management****Outcome:** Maintain health, safety and security at work place**Theory Content:**

- Fire Extinguishers - Types of fire extinguishers, method of operation and care & maintenance.
- Anatomy of Fire - Definition of combustion, elements of combustion, production of combustion, heat of reaction and calorific value.
- Safety Management System, Objectives of Health, Safety and Environment Policy, Responsibility for Implementation of HSE Policy
- Role of Occupier and Factory Manager, Factory Safety Committee, Structure and Functions and Working Tenure Details etc.
- Accident Prevention: Definition, Incident, Accident, Injury, Dangerous occurrence, Unsafe Act, Unsafe Conditions, Hazards,

**Practical Content:**

- Fire Extinguishers - Types of fire extinguishers, method of operation and care & maintenance
- Fire Hose and Hose Fittings, Hydrants and Water Supply

**Tools & Equipment:**

Fire Extinguishers, Hose pipe.

**Module No 2: Jute Spinning, Twisting and Winding machines****Outcome:** Supervise for quality adherence spinning and Winding section with minimum wastage**Theory Content:**

- Explain objectives, Principles of Spinning, Twisting and Winding machine.
- Different types and mechanisms of jute spinning machines (Slip Draft and Apron Draft)
- Explain draft and yarn count and twist. Idea of draft constant and twist constant.
- Identify yarn faults and rectification
- Explain Causes of efficiency loss – doffing loss, idle spindle, speed loss etc.
- Quality Parameters of Some of the plied yarns
- Types of knots used for joining yarn at winding stage and its importance.
- Yarn clearer and yarn tensioning system.
- Yarn waste and its control in Spinning, Twisting and Winding section

**Practical Content:**

- Practical demonstration of 4¼" Slip draft Spinning frame, 4¼" Apron draft Spinning frame, Jute flyer twisting frame, Cop winding machine, Spool winding machine (Traverse type and Groove type), Precision winding machine- operation, machine safety, Identification of each machine parts, Drawing of

gearing diagram and calculations– Draft, draft constant, speed ratios, etc.

- Practical demonstration in spinning knot

**Tools & Equipment:**

4¼" Slip draft Spinning frame, 4¼" Apron draft Spinning frame, Jute flyer twisting frame, Cop winding machine, Spool winding machine (Traverse type and Groove type), Precision winding machine and Twisting machine

**Module No 3: Check for draft (& draft constant) and twist (& twist constant) regularly**

**Outcome:** Calculate & keep check for draft (& draft constant) and twist (& twist constant) regularly

**Theory Content:**

- Coordinate with maintenance people for proper setting of draft change pinion, twist pinion, felt bob position etc. for different count of yarn
- Identify the machine where quality change / count change to be done
- Calculate the draft constant and subsequently draft
- Ensure the availability of Draft change pinion (DCP) and inform the maintenance department for change the pinion
- Calculate the twist constant and subsequently twist
- Ensure the availability of Twist change pinion (TCP) and inform the maintenance department for change the pinion
- Check count and twist of the yarn

**Practical Content:**

- Sliver Testing of Sliver Weight and its CV% at Finisher Drawing sliver.
- Yarn Testing of yarn count and count CV%, yarn strength and strength CV%, Quality Ratio, T.P.I and T.P.I CV% etc.

**Tools & Equipment:**

Yarn Strength Tester, Moisture Meter, Measuring Tape

**Module No. 4: Concept about the man machine ratio and hands complements**

**Outcome:** Evaluate production balancing and allocate of manpower as per requirements

**Theory Content:**

- Spinning production calculations.
- Twisting calculations - machine parameters and production
- Winding production calculations
- Machine Balancing.

**Practical Content:**

- Calculation of production and efficiency of Slip-draft spinning, Apron draft spinning, V-roller draft or grooved roller draft spinning, Twisting machine, Drum or surface winding machines (spool/cone), Precision or Spindle winding machine and weft (cop) winding machine.

**Tools & Equipment:**

4¼" Slip draft Spinning frame, 4¼" Apron draft Spinning frame, Jute flyer twisting frame, Cop winding machine, Spool winding machine (Traverse type and Groove type), Precision winding machine and Twisting machine

**Module No 5: Quality control of Jute Silver & Yarn quality**

**Outcome:** Collect & test sample for quality control of Jute Silver & Yarn quality

**Theory Content:**

- Explain Statistical Quality Control for jute processing
- Identify faults and inform the concern person.
- Identify sample collected from shop floor
- Demonstrate various sampling technique
- Ensure the yarn quality as per company's quality standard
- Ensure quality and standards required in the jute mill in Jute Spinning, Twisting and Winding section
- Identify different techniques for methods of process control
- Identify / rectification of any deviation found in shop floor

**Practical Content:**

- Identify different techniques for methods of process control
- Identify / rectification of any deviation found in shop floor.

**Tools & Equipment:**

Computer, 4¼" Slip draft Spinning frame, 4¼" Apron draft Spinning frame, Jute flyer twisting frame, Cop winding machine, Spool winding machine (Traverse type and Groove type), Precision winding machine and Twisting machine

**Module No. 6: Basic Computer Skill**

**Outcome:** Measure Statistical Quality Control parameters like mean, standard deviation, CV%, PMD etc, and related standards using spread sheet/App

**Theory Content:**

- Basic concept of computer application and its necessity in jute mill
- Introduction of MS Office
  - Use of MS Word
  - Use of MS Excel
  - Use of MS PowerPoint
- Internet and e-mail, procedures, use of apps etc.

**Practical Content:**

- Production data entry, Input of Spinning, Twisting and Winding machine parameters and analysis by using Spread sheet / App

**Tools & Equipment:**

Computer, 4¼" Slip draft Spinning frame, 4¼" Apron draft Spinning frame, Jute flyer twisting frame, Cop winding machine, Spool winding machine (Traverse type and Groove type), Precision winding machine and Twisting machine

**Module No. 7 : OJT**

**Outcome:** Work in real job situation with special emphasis on basic safety and hazards in this domain

**Practical Content:**

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for **150 Hours**.)

**Module No. 8 : Employability Skills (60 Hrs)****Key Learning Outcomes****Introduction to Employability Skills**

Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

**Constitutional values - Citizenship**

Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

**Becoming a Professional in the 21st Century**

Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

**Basic English Skills**

Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

**Career Development & Goal Setting**

Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

**Communication Skills**

Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

**Diversity & Inclusion**

Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

**Financial and Legal Literacy**

Duration: 5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids

**Essential Digital Skills**

Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

**Entrepreneurship**

Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

**Customer Service**

Duration: 5 Hours

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

**Getting Ready for apprenticeship & Jobs**

Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities

**Learning Outcome – Assessment Criteria**

<b>Module No.</b>	<b>Outcome</b>	<b>Assessment Criteria</b>
1	Maintain health, safety and security at work place	<p><b>After completion of this module students will be able to:</b></p> <p>(1.1) Comply with health and safety related instructions applicable to the workplace</p> <p>(1.2) Use personal protective equipment such as “ear plug”, “ nose mask“, “head cap” etc., as per protocol</p> <p>(1.3) Carry out own activities in line with approved guidelines and procedures</p> <p>(1.4) Follow environment management system related procedures</p> <p>(1.5) Communicate safety plan to everyone and attach disciplinary rules with the implementation</p>
2	Supervise for quality adherence spinning and Winding section with minimum wastage	<p><b>After completion of this module students will be able to:</b></p> <p>(2.1) Operate jute spinning and winding machines proficiently, ensuring quality and minimizing wastage.</p> <p>(2.2) Identify yarn faults promptly during practical demonstrations.</p> <p>(2.3) Analyze efficiency losses like doffing time and spindle idling, proposing solutions.</p> <p>(2.4) Evaluate quality parameters of plied yarns, noting improvements.</p> <p>(2.5) Apply different yarn joining knots effectively at the winding stage.</p>
3	Calculate & keep check for draft (& draft constant) and twist (& twist constant) regularly.	<p><b>After completion of this module students will be able to:</b></p> <p>(3.1) Coordinate with maintenance for draft and twist pinion adjustments as per yarn specifications.</p> <p>(3.2) Identify machines needing quality or count adjustments promptly</p>



Module No.	Outcome	Assessment Criteria
		(3.3) Calculate draft constant for consistent drafting. (3.4) Calculate twist constant for precise yarn twist. (3.5) Verify Twist Change Pinion (TCP) availability and coordinate changes with maintenance
4	Evaluate production balancing and allocate of manpower as per requirements.	<b>After completion of this module students will be able to:</b> (4.1) Evaluate spinning production calculations for efficiency. (4.2) Analyze twisting machine parameters to optimize output (4.3) Implement machine balancing techniques for streamlined operations. (4.4) Calculate winding production to maximize resource use. (4.5) Allocate manpower based on production needs. (4.6) Assess efficiency of winding machines for improved output.
5	Collect & sample test for quality control of Jute Silver & Yarn quality	<b>After completion of this module students will be able to:</b> (5.1) Demonstrate Statistical Quality Control proficiency for jute processing. (5.2) Identify and report faults promptly. (5.3) Execute effective sampling techniques. (5.4) Ensure yarn quality meets company standards. (5.5) Implement process control techniques effectively. (5.6) Rectify deviations found on the shop floor promptly.
6	Measure Statistical Quality Control parameters like mean, standard deviation, CV%, PMD etc, and related standards using spread sheet/App	<b>After completion of this module students will be able to:</b> (6.1) Evaluate the use of MS Word for jute mill document creation. (6.2) Calculate statistical parameters using MS Excel. (6.3) Verify data entry and analysis skills using spreadsheets. (6.4) Examine the use of apps to improve jute mill productivity. (6.5) Create presentations using MS PowerPoint. (6.6) Measures various Statistical quality parameters, Production calculation using Spread sheet / App

Module No.	Outcome	Assessment Criteria
7	OJT	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for 150 Hours.)
8	Employability Skill	As per guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees (Practical)

Sl. No.	Name	Specification	Quantity
1.	4¼" Slip draft Spinning frame		01 no
2.	4¼" Apron draft Spinning frame		01 no
3.	Jute flyer twisting frame		01 no
4.	Cop winding machine		01 no
5.	Spool winding machine (Traverse type and Groove type)		01 no
6.	Precision winding machine		01 no
7.	Yarn Strength Tester		01 no
8.	Moisture Meter		01 no
9.	Measuring Tape		05 nos
10.	Vernier		02 nos
11.	Computer	Latest configuration	10 nos

**Marks distribution as per outcome**

Course Name	Sl No	Outcome No.	Outcome Name	Th Hrs	Pr Hrs	Total marks Th	Total marks Pr
<b>Jute Spinning &amp; Twisting/ Winding Technician</b>	1	TXT/3703/OC1	Maintain health, safety and security at work place	10	20	10	90
	2	TXT/3703/OC2	Supervise for quality adherence spinning and Winding section with minimum wastage	40	20	50	120
	3	TXT/3703/OC3	Calculate & keep check for draft (& draft constant) and twist (& twist constant) regularly.	20	10	20	70
	4	TXT/3703/OC4	Evaluate production balancing and allocate of manpower as per requirements.	20	10	20	70
	5	TXT/3703/OC5	Collect & sample test for quality control of Jute Silver & Yarn quality	30	30	30	80
	6	TXT/3703/OC6	Measure Statistical Quality Control parameters like mean, standard deviation, CV%, PMD etc, and related standards using spread sheet/App	20	10	20	70
	7	TXT/3703/OC7	OJT	0	150	0	300
	8	DGT/VSQ/N0102	Employability Skills (60 Hrs)	60	0	50	0
TOTAL Theory 150Hrs, Practical 90 Hrs, OJT 150 Hrs, Employability Skill 60 Hrs						200	800