

## Syllabus for Hand Operated Knitting Machine Operator (Circular &amp; Flat)

<b>Course Name</b>	Hand Operated Knitting Machine Operator (Circular & Flat)
<b>Sector</b>	TEXTILES & HANDLOOM
<b>Course Code</b>	TXT/2024/HOKO/288
<b>Level</b>	2.5
<b>Occupation</b>	Hand Operated Knitting Machine Operator (Circular & Flat)
<b>Job Description</b>	The operator is responsible for knitting process, operation and conducting routine maintenance, troubleshooting the mechanical issues. The candidate will also be responsible for to produce high-quality knitted fabrics in accordance with design specifications. He will prepare the machine, loading yarn and monitor the operations.
<b>Course Duration</b>	<b>Total Duration 270 Hrs (T- 90, P- 180 including OJT-60 and ES-30)</b>
<b>Trainees' Entry Qualification</b>	9th Grade pass OR 8th Grade pass and pursuing continuous schooling OR 8th Grade pass with 1-year Vocational education & Training/Skilling after Grade 8 OR 5 <sup>th</sup> Grade Pass with 4 years relevant experience OR Previous relevant Qualification of NSQF Level 2.0 in Automotive Sector with 6 months relevant experience
<b>Trainers Qualification</b>	B. Tech/B.E. in Textile Technology/ Textile Engineering from AICTE/UGC recognized Engineering College/ university with one-year experience in the relevant field. OR 03 years Diploma in Textile Technology/ Textile Engineering/ Knitting Technology from AICTE recognized board of technical education with two years' experience in the relevant field.

**Structure of Course:**

Module No.	Module name	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs) [Multiple of 30]
1.	<b>Roles &amp; Responsibility</b>	Identify the roles and responsibilities of hand operated circular & flat-bed knitting machine operator	10	20	30
2.	<b>Procedure of knitted fabric formation, operational standards and cleanliness of work area</b>	Demonstrate the procedure of knitted fabric production process and maintenance in hand operated circular & flat-bed knitting machine	30	60	90
3.	<b>Maintain occupational</b>	Apply safe working practices at work place	10	20	30

	<b>safety hazards at work place</b>				
4.	<b>Workplace communication strategies</b>	Demonstrate a comprehensive effective workplace communication strategies	10	20	30
5.	<b>OJT</b>	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	-	60	60
6	<b>Employability Skill</b>	As per guided curriculum	30	-	30
<b>TOTAL:</b>			<b>90</b>	<b>180</b>	<b>270</b>

**SYLLABUS:****Module 1: Roles & Responsibility**

**Outcome:** Identify the roles and responsibilities of hand operated circular & flat-bed knitting machine operator

**Theory Content:**

- Basics of fabric formation in circular and flat-bed knitting machine and principles of loop formation.
- Introduction to different knitted fabric structures: Plain Single Jersey, Rib, Interlock & Purl.
- Role and responsibility of the operator in knitting industry.
- Basic sequences of work in machine floor, concept of job-card, shift handover etc.
- Regular check-points in knitting machines, taking machine status.
- Regular check-points in knitted fabrics.
- Different types of safety protocols.
- Documentation procedure for machine performance.
- Understanding and Review of work orders and pending tasks

**Practical Content:**

- Identify different types of knitting machines: Circular & flat-bed.
- Preparation of shift handover/takeover process
- Demonstrations of procedures for checking the machine status
- Demonstrations of procedures of fabric formation in hand operated circular knitting machines.
- Demonstrations of procedures of fabric formation in hand operated flat-bed knitting machines.
- Demonstrations of procedures of different knitted stitch formation: Knit, Tuck & Float
- Understanding the motion transmission in driving mechanisms of machine.
- Understanding and preparation of the implementation-plan of the work orders
- Communicate with incoming/outgoing shift
- Identify and inspect the tools and equipment
- Handing over/taking over documentation preparation
- Identification of different driving mechanisms of machine.

**Classroom Aids:**

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's

Handbook

**Tools, Equipment and Other Requirements:** Hand operated circular knitting machine, Hand operated flat-bed knitting machine, knitting needle, knit cam, tuck cam, float cam, oil can, gear-train drive etc., basic mechanical toolbox, Aprons, hand-gloves, PPE kits.

## **Module 2: Procedure of knitted fabric formation, operational standards and cleanliness of work area**

**Outcome:** Demonstrate the procedure of knitted fabric production process and maintenance in hand operated circular & flat-bed knitting machine

### **Theory Content:**

- Identify different types of knitting machine: Circular (Single cylinder, Cylinder & dial, double cylinder), Flat bed (Single bed, Double bed)
- Introduction to different knitted fabric structures: Plain Single Jersey, Rib, Interlock & Purl.
- Concept of WPI, CPI, GSM, Loop Length, Loop shape, fabric shrinkage, knit stitch, tuck stitch, float stitch, etc.
- Different parts of hand operated knitting machineries & functions of each component: Circular & Flat bed.
- Driving mechanisms & motion transmission.
- Procedure of different types of knitted fabric formation.
- Procedure of different types of knitting stitches formation: Knit, Tuck & Float. (In both circular and Flat-bed machine).
- Understanding the procedure of adjustment of loop length, yarn tension, fabric winding tension, etc.
- Introduction to latch needle, different parts & it's functioning.
- Replacement of broken or faulty needle.
- Commonly occurred machine-problems, Procedure of troubleshooting techniques.
- Introduction to loop transfer, spirality, plating, welt formation, fabric shaping, etc.
- Different check-points before stating of machine operation.
- Safety guidelines to be followed.
- Actions to be taken in emergency conditions.
- Commonly occurred different knitted fabric fault due error in material, machine & operator: drop stitch, hole, horizontal line, vertical line, spirality, bias, skew, busting, off pattern, soiling, oil stains, press-off, knot, snagging, colour fly.
- Maintaining overall Cleanliness and waste-management techniques in weaving floor.

### **Practical Content:**

- Identify different types of knitting machines: Circular (Single cylinder, Cylinder & dial), Flat bed (Single bed, Double bed).
- Demonstrations of different knitted fabric structure preparation in circular and flat-bed knitting machine: Plain Single Jersey, Rib, Interlock & Purl.
- Demonstrations of procedures of adjustment of loop length, cpi, fabric shrinkage, yarn tension, fabric winding tension, fabric shaping, etc.
- Demonstrations of different knitted fabric stitch formation process: Knit, Tuck & Float.
- Demonstrations of needle replacement procedure.
- Demonstrations of cams replacement procedure.
- Simulate common machine-problems and use diagnostic tools
- Identify and replace damaged feeder and feeder guide.
- Identification of fabric fault related to materials, machine & operator. Identification of their root-causes and rectification.
- Demonstrate implementation procedure on emergency shut down and evacuation
- Role play exercise for incoming and outgoing operator

- Demonstration of practices for Maintaining overall cleanliness, and waste-management techniques in weaving floor.

**Classroom Aids:**

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook.

**Tools, Equipment and Other Requirements:** Hand operated circular knitting machine, Hand operated flat-bed knitting machine, knitting needle, knit cam, tuck cam, float cam, oil can, gear-train drive etc., basic mechanical toolbox, Aprons, hand-gloves, PPE kits.

**Module 3: Maintain occupational safety hazards at work place**

**Outcome:** Apply safe working practices at work place

**Theory Content:**

- Significance of routine cleaning activities of machine maintenance
- Identifying potential hazards associated with a lack of regular cleaning on tools, machines and work areas.
- Types of cleaning agents and tools
- Introduction of Occupational safety
- Overview of relevant occupational safety regulations and standards
- The responsibility of technician in compliance with safety guidelines
- Identification of Occupational safety hazards
- Identification of common hazards in in the machine
- Describe types of hazards
- Application of PPE (Personal protective equipment)
- Selection and use of PPE
- Safe work practices with electrical systems
- Applications of electrical tools
- Describe the importance of immediate response during emergencies
- Fire prevention measures and firefighting equipment's

**Practical Content:**

- Demonstration of cleaning techniques
- Create a check list for routine cleaning tasks and their frequency
- Demonstrate the use protective clothing/equipment for specific tasks and work conditions
- Identify PPE application and its maintenance procedure
- Demonstrate the correct use of safety glasses, gloves and hearing protection
- Simulate an emergency scenario require the use of PPE
- Identify electrical hazards (power supply and points, loose and naked cables and wires, equipment malfunctions, etc.)
- Apply electrical precautions like insulated clothing, adequate equipment insulation, use dry work area etc.
- Identify safety features and emergency stop locations
- Present proper method of rescue techniques applied during fire hazard and other accidental situation.

**Classroom Aids:**

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

**Tools, Equipment and Other Requirements:**

Protective Gloves, Head Caps, Safety Goggles, Safety Boots, Mouth Masks, coats and aprons; ear plugs or muffs; eye and facial protection; head-wear; lifting assistance;

**Module 4: Workplace communication strategies**

**Outcome:** Demonstrate a comprehensive effective workplace communication strategies

**Theory Content:**

- Explain purpose or common goals of each member in a group of willing to work toward. Members feel that they played a role in determining these goals and the methods used to achieve them.
- Describe the task between each members in group, but also with its own processes and operating procedures.
- Maintain Communication is clear and direct manner.
- Interpret machine performance data and metrics
- Explain key indicators of machine health and efficiency
- Follow clear reporting procedures for machine running and performance
- Compliance with organizational policies and procedures. Ethical considerations. Health and safety compliance

**Practical Content:**

- Demonstrate the purpose or common goals of each member in a group of willing to work toward. Members feel that they played a role in determining these goals and the methods used to achieve them.
- Identify the task between each members in group, but also with its own processes and operating procedures. The group periodically evaluates its performance.
- Exhibit the accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required.
- Apply Communication is clear and direct manner.
- Exhibit enterprise ethical standards and requirements for interacting with other employees and staff.
- Apply good communication environmental practices in workplace.
- Simulate/role play of ethical dilemmas in the workplace
- Illustrate organizational policies and procedures

**Classroom Aids:**

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

**Tools, Equipment and Other Requirements:**

Protective Gloves, Head Caps, Aprons, Safety Goggles, Safety Boots, Mouth Masks, Sanitizer, Food Safety Manual, communication tools, communication manual, On-task Communication, Instant Chats , Video Conferencing, Voice Calls, Audio Recording, Discussion Forums, Instant File Sharing, External Communication

**Module 5 : 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 **60 Hours**.)

## **Module 6 : Employability Skills (30 Hrs)**

### **Key Learning Outcomes**

#### **Introduction to Employability Skills Duration: 1 Hour**

After completing this programme, participants will be able to:

1. Discuss the importance of Employability Skills in meeting the job requirements

#### **Constitutional values - Citizenship Duration: 1 Hour**

2. Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.
3. Show how to practice different environmentally sustainable practices

#### **Becoming a Professional in the 21st Century Duration: 1 Hours**

4. Discuss 21st century skills.
5. Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.

#### **Basic English Skills Duration: 2 Hours**

6. Use appropriate basic English sentences/phrases while speaking

#### **Communication Skills Duration: 4 Hour**

7. Demonstrate how to communicate in a well -mannered way with others.
8. Demonstrate working with others in a team

#### **Diversity & Inclusion Duration: 1 Hour**

9. Show how to conduct oneself appropriately with all genders and PwD
10. Discuss the significance of reporting sexual harassment issues in time

#### **Financial and Legal Literacy Duration: 4 Hours**

11. Discuss the significance of using financial products and services safely and securely.
12. Explain the importance of managing expenses, income, and savings.
13. Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws

#### **Essential Digital Skills Duration: 3 Hours**

14. Show how to operate digital devices and use the associated applications and features, safely and securely
15. Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely

#### **Entrepreneurship Duration: 7 Hours**

16. Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges

#### **Customer Service Duration: 4 Hours**

17. Differentiate between types of customers
18. Explain the significance of identifying customer needs and addressing them
19. Discuss the significance of maintaining hygiene and dressing appropriately

#### **Getting ready for apprenticeship & Jobs Duration: 2 Hours**

20. Create a biodata
21. Use various sources to search and apply for jobs
22. Discuss the significance of dressing up neatly and maintaining hygiene for an interview
23. Discuss how to search and register for apprenticeship opportunities

**Learning Outcome – Assessment Criteria**

Module No.	Outcome	Assessment Criteria
1	Identify the roles and responsibilities of hand operated circular & flat-bed knitting machine operator	<p><b>After completion of this module students will be able to:</b></p> <ol style="list-style-type: none"> <li>1.1 Describe the basic of fabric formation in circular and flat bed knitting machines</li> <li>1.2 Identify and differentiate between various knitted fabric structures, including plain single jersey, Rib, Interlock and Purl</li> <li>1.3 Identify circular and flat-bed knitting machines</li> <li>1.4 Perform the shift handover/takeover process effectively</li> <li>1.5 Demonstrate different knitted stitch formations,, including Knit, tuck and float</li> <li>1.6 Demonstrate different types of safety protocols in the knitting industry</li> <li>1.7 Identify different driving mechanism of knitting machine</li> </ol>
2	Demonstrate the procedure of knitted fabric production process and maintenance in hand operated circular & flat-bed knitting machine	<p><b>After completion of this module students will be able to:</b></p> <ol style="list-style-type: none"> <li>2.1 Identify different types of knitting machines</li> <li>2.2 Demonstrate the preparation of different knitted fabric structures in circular and flat-bed knitting machines</li> <li>2.3 Describe the procedure for adjusting loop length, CPI, fabric shrinkage, yarn tension, fabric winding tension, fabric shaping</li> <li>2.4 Demonstrate the procedure for the replacement of needles and cams</li> <li>2.5 Simulate common machine problems by using diagnostic tools to troubleshoot</li> <li>2.6 Identify and replace damaged feeder and feeder guide</li> <li>2.7 Identify fabric faults related to materials, machine and operator errors</li> <li>2.8 Implement procedure for emergency shutdown and evacuation</li> <li>2.9 Perform role play exercises for income and outgoing operators</li> <li>2.10 Maintain overall cleanliness and waste management techniques in the weaving floor.</li> </ol>

Module No.	Outcome	Assessment Criteria
3	Apply safe working practices at work place	<p><b>After completion of this module students will be able to:</b></p> <p>3.1 Demonstrate of effective cleaning techniques</p> <p>3.2 Execute machine specific cleaning procedures</p> <p>3.3 Create a checklist for routine cleaning tasks</p> <p>3.4 Demonstrate the use of protective clothing/equipment for the specific tasks and work conditions</p> <p>3.5 Describe the importance of PPE kit</p> <p>3.6 Demonstrate the correct use of safety gear.</p> <p>3.7 Identify electrical hazards, including power supply issues, loose cables and equipment malfunctioning</p> <p>3.8 Detect health hazards (such as untreated injuries and contagious illness/ zoonotic diseases).</p> <p>3.9 Maintain Fire safety and prevention of fire hazards in workplace [fire extinguishers, fire Alarm, fire exits]</p> <p>3.10 Ensure use of general health and safety equipment and materials in the workplace first aid equipment</p>
4	Demonstrate a comprehensive effective workplace communication strategies	<p><b>After completion of this module students will be able to:</b></p> <p>4.1 Demonstrate the purpose of each team member and their involvement in determining goals</p> <p>4.2 Identify tasks between team members and their own processes</p> <p>4.3 Apply effective communication strategies in a practical context</p> <p>4.4 Exhibit enterprise ethical standards in workplace interactions</p> <p>4.5 Apply good communication environmental practices in practical workplace</p> <p>4.6 Simulate/Role play ethical dilemmas in the work place</p> <p>4.7 Explain the organizational policies and</p>



Module No.	Outcome	Assessment Criteria
		procedures
5	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).
6	Employability Skill	As per guided curriculum

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

SI No	Items Name	Specification	Qty
1	Hand operated circular knitting machine,		2
2	Hand operated flat-bed knitting machine		2
3	Knitting needle		6
4	Knit cam, Tuck cam and Float cam		2 each
5	Oil can		1
6	Gear-train drive		1
7	Basic mechanical toolbox		30
8	PPE kits.		30
9	Computer	Latest configuration	1
10	White board	Standard 6'x4'	1
11	Marker		As required
12	Chart papers		As required
13	Projector		1
14	Aprons	Standard	30
15	Ear plugs		30
16	Eye and facial protection		30
17	Muffs		30
18	Head-wear		30
19	Hand gloves		30
20	Mesh aprons		30
21	Fire extinguishers		2
22	Fire Alarm		2
23	First aid equipment		3

## Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr. marks	Total OJT marks
Identify the roles and responsibilities of hand operated circular & flat-bed knitting machine operator	TXT/3706/OC1	30	150	0
Demonstrate the procedure of knitted fabric production process and maintenance in hand operated circular & flat-bed knitting machine	TXT/3706/OC2	60	200	0
Apply safe working practices at work place	TXT/3706/OC3	30	150	0
Demonstrate a comprehensive effective workplace communication strategies	TXT/3706/OC4	30	150	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	TXT/3706/OC5	0	0	150
Employability Skills - 30 Hrs	DGT/VSQ/N0101	50	0	0