

Syllabus for Sewing Machine Maintenance Technician

Course Name	Sewing Machine Maintenance Technician
Sector	Apparel, Made-Ups & Home Furnishing
Sub-sector	APL/2024/SMMT/413
Course Code	(To be given by WBSCTVESD)
Level	4
Occupation	Sewing Machine Maintenance Technician
Job Description	Sewing Machine Maintenance Technician is responsible for ensuring the optimal functionality and performance of sewing machines in manufacturing facility. The ideal candidate will possess a strong understanding of mechanical systems, including the ability to troubleshoot, diagnose and repair various sewing machine issues efficiently. Duties include conducting regular preventive maintenance, identifying and replacing faulty components, calibrating machines for optimal performance and maintaining accurate records of maintenance activities.
Course Duration	Total Duration 450 Hrs. (T-90, P-240, OJT-60 and ES-60)
Trainees' Entry Qualification	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' relevant experience OR Previous relevant Qualification of NSQF Level 3.0 with minimum education as 8th Grade pass with 3-year relevant experience OR Previous relevant qualification of NSQF Level 3.5 with 1.5-year relevant experience
Trainers Qualification	Degree in Costume Design/ Dress Making/ Fashion Technology/ Apparel Technology with 1 year experience in the relevant field OR 3 years Diploma in Costume Design & Dress Making/ Fashion Technology from recognized Institute with 2 years of Experience in the field OR NAC/NTC in relevant trade with 3 years' experience in relevant field

Structure of Course:

Module No.	Module name	Outcome	Compulsory/ Elective	Theory (Hrs.)	Practical (Hrs.)	OJT (Hrs.)	Total (Hrs.) [Multiple of 30]
1	Stitching Station Configuration	Assemble and adjust the stitching station for optimal performance.	Compulsory	30	60		90
2	Machine Maintenance Routine	Perform routine maintenance of sewing machines to ensure smooth operation and prevent long term damage.	Compulsory	20	70		90
3	Sewing Machine Diagnostic and Repair	Identify and troubleshoot common issues in sewing machines and perform necessary repairs.	Compulsory	30	90		120
4	Health, Safety, and Environment at workplace	Maintain Health, Safety and Environment at workplace.	Compulsory	10	20		30
5	OJT	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Compulsory	-	-	60	60
6	Employability Skill	As per guided curriculum	Compulsory	60	-		60
TOTAL				150	240	60	450

SYLLABUS:**Module No. 1: Stitching Station Configuration**

Outcome: Assemble and adjust the stitching station for optimal performance.

Theory Content:

- Interpret the different parts of a sewing machine and their functions (e.g., needle, bobbin, presser foot, tension discs)
- Mechanism of stitch formation (how the upper and lower thread interlock to create a seam)
- Feed dog mechanism (how the fabric is advanced under the needle)
- Different types of sewing thread (e.g., cotton, polyester, nylon)
- Thread weight and its relation to fabric type
- Thread tension and its impact on stitch quality
- Sewing machine needle types and sizes (e.g., universal, ballpoint, jersey)
- Choosing the right needle for different fabrics (e.g., delicate fabrics require finer needles)
- Understanding needle parts (e.g., shank, eye, point)
- Different types of fabrics and their sewing requirements (e.g., woven vs. knit)
- Fabric weight and its impact on needle and thread selection
- Importance of balanced tension between upper and lower thread
- How tension affects stitch quality (e.g., skipped stitches, puckering)
- Adjusting tension based on fabric and thread type
- Different types of presser feet and their specific uses (e.g., zipper foot, buttonhole foot)
- How to attach and remove presser feet
- Selecting the appropriate presser foot for different sewing project

Practical Content:

- Check the machine manual for specific requirements or instructions for machine setup.
- Install a sewing machine needle appropriately for fabric and project as per machine's manual.
- Raise and lower the presser foot using the presser foot lever for inserting and removing fabric.
- Perform proper threading to ensure the upper thread is correctly tensioned, reducing the risk of thread breakage or uneven stitches.
- Place an empty bobbin on the bobbin winder spindle.
- Pass the end of thread through the bobbin's hole and hold it with hand.
- Engage the bobbin winder by pushing it towards the right.
- Start the sewing machine and ensure bobbin should wind with the thread evenly.
- Cut the thread and remove the bobbin from the winder when its full.
- Insert the bobbin by opening the bobbin case or remove the cover, depending on machine's design.
- Place the wound bobbin into the case, following the arrows or guide marks.
- Pull the thread through the bobbin case's slot, leave a few inches of thread hanging.
- Close the bobbin case or cover, ensuring it's properly secured to ensure the bobbin is correctly inserted and ready for use during sewing.
- Perform tension adjustment for professional sewing results.
- Perform Tension control, managed by a dial or knob, regulates stitch tightness.
- Identify appropriate tension for lighter and heavier fabrics as per machine's manual.
- Select the appropriate sewing machine needle for fabric and project.
- Check machine's manual for guidance on needle types and sizes.
- Install the needle, ensure that the flat side faces the back of the machine, insert it fully into the needle clamp, and securely tighten the needle clamp screw.

- Identify different types of feet, such as standard, zipper, buttonhole, and walking feet.
- Attach presser foot, raise the presser foot lever to its highest position, align the presser foot's shank with the presser foot holder, and lower the presser foot holder's lever to secure the foot in place and make sure it's snugly attached before starting the project.
- Run a quick test stitch to see if everything functions correctly and adjust settings if required.

Module No. 2: Machine Maintenance Routine

Outcome: Perform routine maintenance of sewing machines to ensure smooth operation and prevent long term damage.

Theory Content:

- Identify the different parts of a sewing machine and their functions (e.g., feed dog, rotary hook, shuttle, tension discs).
- Interpret how these parts interact during sewing to create a stitch.
- How lint, dust, and thread build up can affect sewing machine performance (e.g., skipped stitches, uneven seams).
- Prevent long-term damage from accumulated debris.
- Importance of using the correct type of sewing machine oil.
- Identify lubrication points on your specific machine model.
- How lubrication reduces friction and wear on moving parts.
- Unplugging the machine before cleaning or oiling.
- Use of proper tools to avoid damaging delicate parts.
- Protect the motor from oil and cleaning solvents.
- Run test stitch after cleaning and oiling to ensure smooth operation.
- Wiping away excess oil to prevent staining fabric.

Practical Content:

- Open the slide plate and remove the bobbin case and then remove the throat plate.
- brush or blow away lint, dust, or loose threads in the area around the feed dog and rotary hook, shuttle using proper instrument.
- Brush out any lint, dust, or threads from the lower part of the machine.
- Use a soft, thin and clean cloth to remove any lint on the machine parts.
- Unscrew all plates and screws and the bobbin case.
- Check the needle to be sure it is clean and the eye is not clogged.
- Replace the needle, if necessary.
- Wipe away any excess oil or dust on the head, machine bed, motor, table, and stand.
- Remove the lint between the tension discs and in the thread guides.
- Remove all the parts that is, the needle, presser foot, slide plate, throat plate, bobbin case, and the face plate. Put them in the tray and soak in cleaning fluid.
- Wrap the motor to protect it from oil and cleaning solvent. Ensure that the sewing machine has been unplugged.
- Clean the feed dog, remove the needle plate of the machine and brush off all lint deposits and dirt sticking to different parts.
- Clean the shuttle case, remove all the screws holding the shuttle case. Take out the shuttle case and wipe its groove free of dirt, and thread bits.
- Remove thread bits which are caught in the wheel along with all lint and dust stick to the treadle parts.
- Use cloth or small brush to clean near the needle and feed dog.
- Remove dirt or lint jammed inside a bearing by continuously run the machine and flush it with the cleaning fluid until the dirt and gummed oil are washed from the bearing.

- Remove bobbin and bobbin case, and clean small thread particles from there.
- Clean the hand wheel, washer, and the shaft.
- Lubricate the shaft with sewing machine oil and place small amount of grease on all gears.
- Reassemble the hand wheel and clutch.
- Reassemble all the parts of the sewing machine and run it.
- Oil the machine using the directions given in the machine manual.
- Inspect the condition of all visible parts of the machine at time of oiling.
- Locate oil holes of the sewing machine by identifying arrows, or red or yellow paint.
- Put required drops of oil into each hole and ensure machine is not clogged by excess oil.
- Turn the hand wheel manually so that the oil will work its way between the parts.
- Wipe off all dust and excess oil from the machine or table; clean up any spilled oil immediately.
- Sew on a few fabric scraps to remove any excess oil.

Module No. 3: Sewing Machine Diagnostic and Repair

Outcome: Identify and troubleshoot common issues in sewing machines and perform necessary repairs.

Theory Content:

- Discuss the cause and different defects and the corrective action to be taken.
- Pressure Foot Adjustment and Feed Dog Cleaning for Material Feeding Issues.
- Lubrication and Belt Tension Adjustment for Smooth Machine Operation.
- Power Supply and Foot Pedal Functionality in Sewing Machine Operation.
- Thread Tension Adjustment and Proper Threading Techniques.
- Bobbin Tension Adjustment and Quality Bobbin Thread Usage.
- Needle Replacement, Correct Needle Size, and Timing Adjustment.
- Stitch Formation Theory: Tension Adjustment, Needle/Thread Compatibility, and Bobbin Inspection.
- Irregular Stitch Analysis: Tension Adjustment, Feed Dog Cleaning, and Bobbin Check.
- Fabric Puckering Prevention: Tension Adjustment, Presser Foot Pressure, and Needle Selection.
- Thread Bunching Troubleshooting: Tension Adjustment, Threading Techniques, and Bobbin Examination.
- Needle Breakage Causes and Solutions: Needle Type, Condition, and Insertion Methods.
- Sewing Machine Noise and Jamming: Foreign Object Removal, Mechanical Inspection, and Timing Check.
- Threading Mechanism Theory: Correct Threading Path, Tension Adjustment, and Mechanism Inspection.
- Needle Eye Entry Theory: Needle Sharpness, Size Compatibility, and Correct Threading Procedure.

Practical Content:

- Adjust pressure foot pressure and clean feed dogs to resolve material feeding issues.
- Lubricate the machine and adjust belt tension in case of machine running heavily for smoother operation.
- Check power supply and foot pedal functionality to fix non-running machine.
- Adjust tension, use quality thread, and rethread correctly to prevent upper thread breaks.
- Adjust bobbin tension and use good-quality thread to prevent bobbin thread breaks.
- Replace dull or bent needle, use correct size, and check timing for skipped stitches.

- Adjust tension, use compatible needle/thread, and check bobbin for proper stitch formation.
- Adjust tension evenly, clean feed dogs, and check bobbin for irregular stitches.
- Adjust tension and presser foot pressure, use appropriate needle to prevent fabric puckering.
- Adjust tension, rethread machine properly, and check bobbin for thread bunching.
- Use correct needle type, replace bent/damaged needle, and ensure proper insertion to avoid needle breaks.
- Stop machine, inspect for foreign objects, and check for mechanical/timing issues for loud noises or jamming.
- Rethread machine correctly, adjust thread tension, and inspect threading mechanism for threading issues.
- Replace blunt needle, use correct size, and rethread machine properly to ensure thread enters needle eye.

Module No. 4: Health, Safety and Environment at workplace

Outcome: Maintain Health, Safety and Environment at workplace.

Theory Content:

- Definition and importance of Health, Safety, and Environment in the workplace.
- Benefits of effective HSE management for employees, employers, and the community.
- Overview of relevant laws, regulations, and standards governing HSE practices.
- Types of workplace hazards (e.g., physical, chemical, biological, ergonomic).
- Conducting risk assessments and implementing control measures.
- Types of PPE and their uses (e.g., gloves, goggles, respirators, hearing protection).
- Proper selection, fitting, and maintenance of PPE.
- Developing emergency response plans (e.g., fire evacuation, medical emergencies).
- Training on emergency procedures, alarm systems, and evacuation routes.
- Understanding environmental aspects and impacts of work activities.
- Mitigation measures for reducing environmental pollution and waste generation.
- Proper handling, storage, and disposal of hazardous and non-hazardous waste.
- Promoting recycling, reuse, and sustainable practices in waste management.
- Ergonomic principles for reducing musculoskeletal disorders and injuries.
- Designing ergonomic workstations and equipment adjustments.
- Recognizing signs of stress, anxiety, and depression in the workplace.
- Providing support, resources, and mental health initiatives for employees.
- Establishing key performance indicators (KPIs) for HSE metrics.
- Conducting audits, inspections, and incident investigations for continuous improvement.
- Maintaining records, reports, and documentation related to HSE activities.
- Demonstrating compliance with regulatory requirements and industry standards.

Practical Content:

- Conduct hazard identification walkthroughs and risk assessments to recognize potential hazards in various work environments.
- Select and Use Personal Protective Equipment (PPE).
- Develop emergency response plans, including evacuation procedures, emergency contacts, and communication protocols.

- Implement Hazard Control Measures.
- Conduct Environmental Impact Assessments.
- Manage Hazardous and Non-Hazardous Waste.
- Promote Ergonomic Work Practices.
- Recognize Mental Health Concerns.
- Foster a Safety Culture.
- Conduct Safety Training and Competency Development.

Module 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 **60 Hours.**)

Module 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

Module No.	Outcome	Assessment Criteria
1	Assemble and adjust the stitching station for optimal performance.	After completion of this module students will be able to: 1.1 Position the machine on a hard flat surface. 1.2 Select and install the needle securely into the needle bar. 1.3 Select the suitable thread according to the type of fabric to be used. 1.4 Wind the thread into the bobbin. 1.5 Follow the thread guide, thread the machine from the spool pin to the needle. 1.6 Set the machine of required stitch length. 1.7 Balance the thread tension on the sewing machine. (adjust the upper tension in relation to the lower tension)
2	Perform routine maintenance of sewing machines to ensure smooth operation and prevent long term damage.	After completion of this module students will be able to: 2.1 Brush or blow away lint, dust or loose threads in the area around the feed dog and rotary hook, shuttle using proper instrument. 2.2 Brush out any lint, dust or threads from the lower part of the machine. 2.3 Unscrew all plates and screws and the bobbin case. 2.4 Check the needle to be sure it is clean and the eye is not clogged. 2.5 Replace the needle, if necessary. 2.6 Wipe away any excess oil or dust on the head, machine bed, motor, table and stand. 2.7 Remove the lint between the tension discs and in the thread guides. 2.8 Remove all the parts that is, the needle, presser foot, slide plate, throat plate, bobbin case, and the face plate. Put them in the tray and soak in cleaning fluid. 2.9 Wrap the motor to protect it from oil and cleaning solvent. 2.10 Clean the feed dog, remove the needle plate of the machine and brush off all lint deposits and dirt sticking to different parts. 2.11 Clean the shuttle case, remove all the screws holding the shuttle case. Take out the shuttle case and wipe its groove free of dirt, and thread bits. 2.12 Use cloth or small brush to clean near the needle and feed dog.

Module No.	Outcome	Assessment Criteria
		2.13 Remove dirt or lint jammed inside a bearing by continuously run the machine and flush it with the cleaning fluid until the dirt and gummed oil are washed from the bearing. 2.14 Remove bobbin and bobbin case, and clean small thread particles from there. 2.15 Clean the hand wheel, washer, and the shaft. 2.16 Reassemble the hand wheel and clutch. 2.17 Reassemble all the parts of the sewing machine and run it. 2.18 Oil the machine using the directions given in the machine manual. 2.19 Locate oil holes of the sewing machine by identifying arrows, or red or yellow paint. 2.20 Put required drops of oil into each hole and ensure machine is not clogged by excess oil. 2.21 Wipe off all dust and excess oil from the machine or table; clean up any spilled oil immediately.
3	Identify and troubleshoot common issues in sewing machines, and perform necessary repairs.	After completion of this module students will be able to: Identify possible causes and perform corrective action for the Machine and Sewing Defects: 3.1 The machine does not feed the material 3.2 Machine running heavily 3.3 the sewing machine does not run 3.4 The upper thread breaks 3.5 The bobbin thread breaks 3.6 Skipped stitches 3.7 The stitches are not formed properly 3.8 Irregular stitches 3.9 Fabric pucker 3.10 Bunching of thread 3.11 Needle breaks 3.12 Loud noise is heard and/or knocking noise; machine jammed 3.13 Threading cannot be done 3.14 The thread does not enter the eye of the need
4	Maintain Health, Safety, and Environment at workplace.	After completion of this module students will be able to: 4.1 Conduct hazard identification walkthroughs and risk assessments to recognize potential hazards in various work environments. 4.2 Properly select, fit and use different types of PPE (e.g., gloves, goggles, respirators) for specific job tasks and hazards. 4.3 Create comprehensive emergency response plans for various scenarios, including fire evacuations, medical emergencies and hazardous spills. 4.4 Apply appropriate control measures to mitigate workplace hazards and reduce risks to health and safety.

Module No.	Outcome	Assessment Criteria
		4.5 Assess environmental aspects and impacts of work activities and develop strategies to minimize environmental pollution and waste generation. 4.6 Demonstrate proper handling, storage and disposal procedures for hazardous and non-hazardous waste materials in compliance with regulations. 4.7 Identify ergonomic issues in workstations and equipment and make adjustments to reduce musculoskeletal disorders and injuries. 4.8 Promote a positive safety culture through effective leadership, communication, employee engagement and participation in safety initiatives. 4.9 Develop and deliver HSE training programs to enhance employee awareness, competency and skills in HSE practices and 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)

S.No.	Tools and Equipment For machine installation and setup	Quantity
1.	Sewing Machines	5 Nos.
2.	Bobbin Winders	2 Nos.
3.	Scissors	30 pairs
4.	Seam Rippers	30 Nos.
5.	Tape Measures	30 Nos.
6.	Needles (Assorted sizes)	300 pieces
7.	Thread Clippers	15 Nos.
8.	Maintenance Kits for Sewing Machines	5 kits
9.	Pressing cloth	As required
10.	Pin cushions	As required
11.	Pin	As required
12.	Screwdriver	30 Nos.
13.	Sewing machine manual	30 Nos.
14.	Small vacuum cleaner	15 Nos.

S.No.	Description of Safety Gear	Quantity
1.	Safety Glasses	30 pairs
2.	Gloves	30 pairs
3.	Aprons	30 Nos.
4.	Ear Protection	30 pairs

S.No.	Description of Maintenance and Cleaning Supplies	Quantity
1.	Cleaning Brushes ($\frac{1}{2}$ " to $\frac{3}{4}$ " wide)	30 Nos.
2.	Lint Rollers	30 Nos.
3.	Lubricating Oil for Machines	10 bottles
4.	Machine Cleaning Cloths	As required
5.	Cleaning solvent or fluid	10 bottles

S.No.	Description of Classroom Furniture	Quantity
1.	Sewing Tables	6 Nos.
2.	Chairs	31 Nos.
3.	Whiteboards or Flipcharts for Demonstrations	1 No.

S.No.	Description of Technology and Audiovisual Equipment	Quantity
1.	Projectors and Screens for Presentations	1 No.
2.	Audio Systems (Microphones, speakers)	As required

S.No.	Description of Technology and Audiovisual Equipment	Quantity
1.	First Aid Kit	As required
2.	Trash Bins	2 Nos.

Marks Distribution

Outcome	Outcome Code	Total Th marks	Total Pr marks	Total OJT marks
Assemble and adjust the stitching station for optimal performance.	APL/0317/OC1	50	160	0
Perform routine maintenance of sewing machines to ensure smooth operation and prevent long term damage.	APL/0317/OC2	30	170	0
Identify and troubleshoot common issues in sewing machines and perform necessary repairs.	APL/0317/OC3	50	190	0
Maintain Health, Safety and Environment at workplace.	APL/0317/OC4	20	130	0
Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	APL/0317/OC5	0	0	150
Employability Skills – 60 Hrs	DGT/VSQ/N0102	50	0	0