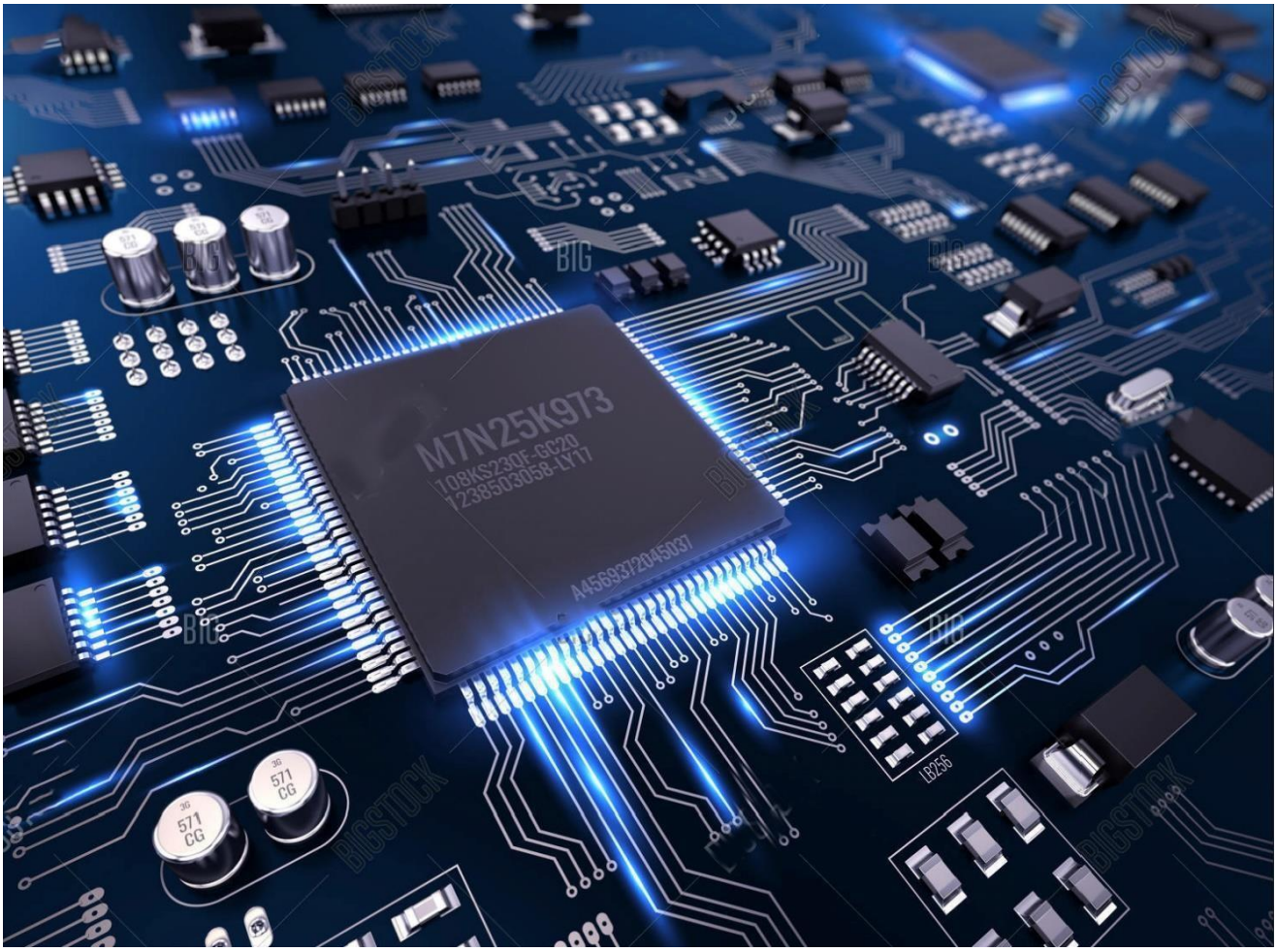

Model Curriculum

QP Name: Telecom Surface Mount Technology (SMT) Technician

QP Code: TEL/Q2501

QP Version: 4.0

NSQF Level: 4

Model Curriculum Version: 2.0

Telecom Sector Skill Council of India,
Estel House, 3rd Floor, Plot No: - 126, Sector 44
Gurugram, Haryana 122003

Table of Contents

Training Parameters

Sector	Telecom
Sub-Sector	Handset
Occupation	Communication Electronics
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO – 2015/3114.1403
Minimum Educational Qualification & Experience	11th grade pass **OR** Completed 1st 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-year relevant experience **OR** Previous relevant Qualification of NSQF Level 3 with minimum education as 5th Grade pass with 2-year relevant experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	17 Years
Last Reviewed On	24/02/2022
Next Review Date	24/02/2025
NSQC Approval Date	24/02/2022
QP Version	4.0
Model Curriculum Creation Date	24/02/2022
Model Curriculum Valid Up to Date	24/02/2025
Model Curriculum Version	2.0
Minimum Duration of the Course	570 Hours, 0 Minutes
Maximum Duration of the Course	570 Hours, 0 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Illustrate the process of preparation of screen printing of telecom boards.
- Demonstrate components placement on telecom board.
- Demonstrate the process of soldering reflow on telecom boards.
- Perform cleaning and inspection of telecom boards.
- Organize work and resources as per health and safety standards.
- Communicate, develop interpersonal skills, and develop sensitization towards gender and person with disability.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**20:00**	**10:00**	**00:00**	**-**	**30:00**
Module 1: Bridge Module Role and Responsibilities of Telecom Surface Mount Technology (SMT) Technician	20:00	10:00	00:00	-	30:00
TEL/N2503– Screen Printing of telecom Boards **NOS Version No. 2.0** **NSQF Level 4**	**40:00**	**50:00**	**30:00**	**-**	**120:00**
Module 2: Screen Printing of telecom Boards	40:00	50:00	30:00	-	120:00
TEL/N2504– Component placement on telecom boards **NOS Version No. 2.0** **NSQF Level 4**	**30:00**	**30:00**	**30:00**	**-**	**90:00**
Module 3: Component placement on telecom boards	30:00	30:00	30:00	-	90:00
TEL/N2505 – Reflow soldering on telecom boards **NOS Version No. 2.0** **NSQF Level 4**	**30:00**	**30:00**	**30:00**	**-**	**90:00**
Module 4: Reflow soldering on telecom boards	30:00	30:00	30:00	-	90:00

TEL/N2502 – Cleaning and inspection of telecom boards **NOS Version No. 2.0** **NSQF Level 4**	**30:00**	**30:00**	**30:00**	**-**	**90:00**
Module 5: Cleaning and inspection of telecom boards	30:00	30:00	30:00	-	90:00
(Bridge Modules) - Industrial Education	**10:00**	**20:00**	**00:00**	**-**	**30:00**
Module 6: Industrial Education	10:00	20:00	00:00	-	30:00
TEL/N9101 – Organize work and resources as per health and safety standards **NOS Version No. 1.0** **NSQF Level 4**	**10:00**	**20:00**	**00:00**	-	**30:00**
Module 7: Plan Work Effectively, Optimise Resources and Implement Safety Practices	10:00	20:00	00:00	-	30:00
TEL/N9102 – Interact effectively with team members and customers **NOS Version No. 1.0** **NSQF Level 4**	**10:00**	**20:00**	**00:00**	-	**30:00**
Module 8: Communication and interpersonal skills	10:00	20:00	00:00	-	30:00
DGT/VSQ/N0102 Employability Skills (60 Hours)	60:00	00:00	00:00	-	60:00
Total Duration	**240:00**	**210:00**	**120:00**	**-**	**570:00**

Module Details

Module 1: Introduction to role and responsibilities of Telecom Surface Mount Technology (SMT) Technician

Mapped to Bridge Module

Terminal Outcomes:

- Understand role and responsibilities of Telecom SMT Technician
- Core functionality includes, screen printing, component placement, reflow soldering, cleaning and inspection, including re-work to address defects.

Duration: *20:00*	**Duration**: *10:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Understand the fundamentals of electronics • Understanding various Active & Passive components including Resistors, capacitors, inductors and colour coding of capacitors and resistors. • Understand Diode – Switch and rectifier, Transistor – amplifier and switch, Logic Gates • Basic knowledge of electronic circuits and functions (transmitters, receivers, switches, power supplies, amplifiers, multiplexers, couplers, registers, memory and all RF circuits in telecom equipment • Introduction to PCB • Multi layered PCB – important concepts • Understanding the properties of copper – clad laminates (CCL), layout design and planning • Cleaning of Boards before pattern transfer • Understands Installing and repairing other electronics components such as resistors and capacitors	• Perform all Surface Mount Technology (SMT) assembly tasks, such as preparing the board, placing the components, soldering, inspecting the work, and reworking • Perform in-process inspections throughout the SMT assembly process • Identify process and quality issues and take corrective action as needed • Demonstrate the proper use of reflow ovens, solder paste printers, and pick-and-place machines for SMT assembly
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Documents of standard operating procedures, code of conduct, checklists, installation and troubleshooting tools/equipment's, status report	

Module 2: *Screen Printing of telecom Boards Mapped to* TEL/N2503

Terminal Outcomes:

- Baking of boards
- Screen printing process
- Handling of end-to end SMT process

Duration: *40:00*	**Duration: *50:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Ascertain baking requirements as per customer Specifications / Industrial Standards • Understand the relevance of proper thawing of soldering paste, cleaning of stencils and even application of soldering paste on the PCB • Demonstrate selection of correct tools and components/accessories • Explain the impact of temperature and humidity on the process • Select proper squeeze as per the PCB size • Understand use of solder paste to apply • Selection of Correct Squeeze equipment • Proper Positioning of the stencil, Solder paste, squeeze in the Screen printer • Setting Parameters and operating screen-printing Equipment/ Machinery.	• Demonstrate the impact of moisture on PCBs and relevance of baking • Perform application of selection of soldering paste with desired characteristics • Cleaning process of stencil before and after use • Demonstrate the impact of proper alignment and supporting of screen by proper locating of support pins • Demonstrate the operational activities of screen-printing machine • Explain the importance of proper stowage of consumables • Quality requirements of PCBs like warpage issues/ fiducial mark availability etc.
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
IC Baking oven, Stencils, Screens, PC Boards, Solder paste, squeezers, Screen Printers, ink Personal Protection Equipment: safety glasses, head protection, warning signs and tapes	

Module 3: Component placement on telecom boards
Mapped to TEL/N2504

Terminal Outcomes:

- Understand assembly operations of telecom devices/products
- Demonstrate post assembly activities
- Demonstrate the process of component placement on telecom boards

Duration: *30:00*	**Duration: *30:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Feeding X-Y Coordinate Data - Setting Horizontal and vertical Addresses on Computer Screen • Feeding Gerber data - using in PCB fabrication System • Working with UI - User interface • Concept of Data entry / Loading of placement Program to the chip shooter • Mapping Program and board • Check the Operation of the Roll Feeder Mechanism • Identify the slot numbers vis - a - vis (in relation to) feeder rolls to be loaded • Verify Component Rolls as per the PART no. / Work Specification • Loading Chip component rolls in Right feeders • Verify the board and Corresponding Placement of DATA • Verify Components vis a vis as per the PART no. / Work Specification • Loading Component's on the Tray as per the Placement Program • Placing the Component's in the with Correct orientation in the Feeder Trays • Checking the operation of the Mechanism including vision cameras • Verifying Correct loading of boards, Program and component rolls/trays • Check the Placement of Vacuum Pressure • Checking the function of the feed Mechanism and ensure error free operation • Operate the component Placement Equipment	• system specifications, part/ pattern numbers and Bill of Material • operating parameters of component placement machines/ equipment KB3. understanding of Gerber and x-y co-ordinate data • operations cycle of the component placement machine/ equipment • reading/ verifying components under microscope to check correct placement and connectivity (no bend pins/ legs etc.) • ESD precautions and hygiene • type of SMT defects like tombstone and solder short

• Use Tape Board Technique to verify the Placement Accuracy • Use Microscope to check the correctness of components placement for sample boards	
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Pick & Place Machines, Electronic component rolls/modules Personal Protection Equipment: safety glasses, head protection, warning signs and tapes	

Module 4: Reflow soldering on telecom boards
Mapped to TEL/N2505

Terminal Outcomes:

- Prepare soldering re-flow process on telecom boards
- Demonstrate re-flow operation on the PCB and its QA checks

Duration*: 30:00*	**Duration: *30:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Get the solder paste parameters from Data Sheet • Get the Suggested Setting Parameters • Understand solder characteristic at various temperature points • Undertake corrective action if problem persists • Undertake setting of machines is set as per the parameters as ascertained during the preparatory process • Prepare and pass the loaded PCB (with solder and components placed) through the re-flow machine	• Load the parameters in the re flow Machine • Record the readings as it is passing one sample board into reflow machine • Matching the readings with desired Outcome • Demonstrate the effects of non-compliance of solder characteristic on the PCB performance • Set re-flow machine chamber temperature and PCB carrying belt speed to meet the desired characteristic. • Demonstrate the effects of dry solder, cracked joints, voids, uneven reflow and delamination of PCB • Safely remove the PCB at the end of the cycle • Check for any dry solder • Check to ascertain even reflow, any voids and tomb stone • Check for De-lamination • Check for any misalignment and/or disturbed components • Check for any damage on the PCB
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Solder Mixer/Paste, Reflow Machine Personal Protection Equipment: safety glasses, head protection, warning signs and tapes	

Module 5: Cleaning and inspection of telecom boards
Mapped to TEL/N2502

Terminal Outcomes:

- Demonstrate the process of cleaning of telecom boards.
- Demonstrate inspection – quality checks and assurance.

Duration: *30:00*	**Duration: *30:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Understand the IPC standards of soldering • Prepare PCB Free from flux residues • Prepare PCB Free from White patches / powder • Clean the PCB with Specified - Solvent/ Agent • Ensuring Safe and proper storage of Cleaned PCBs	• Demonstrate the use of cleaning chemicals/ solvents for PCBs • Demonstrate the process of cleaning • Demonstrate the use of vapor de-freezer equipment for PCB cleaning • Perform Quality Analysis (QA) or Quality Check (QC) parameters relating to the manual soldering • Operate vapour de-greaser (boil, rinse, vaporize and dry) to clean the boards • Check PCB for any missing components, wrongly placed components • Check the soldering workmanship and defects • Check the PCB assembler if any defects. • Check the completeness of requirement specifications and documentation • Check for all available infrastructure and test equipment • Check for complaint handling and escalation process • Check for Proper Jigs and settings
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
Board Cleaning solvents/solutions, De-Greasers, PCB Storage system (ESD Compliant) Personal Protection Equipment: safety glasses, head protection, warning signs and tapes	

Module 6: Industrial Education

Mapped to Bridge Module

Terminal Outcomes:

- Build proper relationship with colleagues
- Prepare different log sheet

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Communicate with Colleagues, peers and supervisor and stake holders • Liaising and Coordination skills • Listen effectively and orally communicate information accurately • Quality Check (QC) Tools • Maintenance procedures and basic maintenance management/Objectives • Routine, Preventive Predictive, and Break down maintenance • Basic Store management • Industrial Act, Company Standards • ERP and Log sheet/Logbook • Importance of standard operating procedure	
Classroom Aids:	
White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
EPR, Log sheet, Logbook, etc Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher and first aid kit	

Module 7: Plan Work Effectively, Optimise Resources and Implement Safety Practices
Mapped to TEL/N9101

Terminal Outcomes:

- Plan work effectively, implement safety practices and optimise use of resources

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the importance of following the standard operating procedures of the company w.r.t. privacy, confidentiality and security • Explain how to develop skills and expertise in the job role • List the key performance indicators for the new tasks • Discuss correct way to show emotions at workplace • Identify the issues with and handle them • Describe the importance of timely completion of tasks • Explain the importance of escalation matrix • Explain the importance of providing and receiving feedback constructively • Identify different types of hazards such as illnesses, accidents, fires, etc. • List the causes of risks and potential hazards in a work area and the ways to prevent them • List the steps to report accident and health related issues as per SOP • Explain the importance of maintaining proper posture at work, especially when handling heavy and hazardous materials • Analyse ways to optimise usage of resources • Discuss how to optimise the use of electrical equipment and appliances to ensure that they conform to safety and resource conservation norms • List the importance, cause and effect of greening of jobs • Explain the concept of waste management • List the methods of waste disposal • Identify the different categories of waste for the purpose of segregation	• Demonstrate techniques to save on cost and time • Demonstrate routine cleaning of tools, equipment and machines to ensure team follows the same practices • Use resources such as water judiciously • Perform basic steps to check for malfunctions in equipment and report as per SOP • Report any breaches in safety and security to the concerned person • Illustrate ways to keep work area clean such as mopping spills and leaks, cleaning grease stains, etc. • Perform basic steps to check for spills and leaks and plug the same • Demonstrate segregation of different types of hazardous waste • Illustrate steps to minimise waste • Illustrate proper waste disposal procedures and how to dispose-off hazardous waste • Illustrate ways to find exact cause of a problem and validate the same in case done by a team member

• Differentiate between recyclable and non-recyclable waste • List electronic waste disposal procedures • List the common sources of pollution and the ways to minimize it	
Classroom Aids:	
White board/ black board marker / chalk, duster, computer or laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher and first aid kit	

Module 8: Communication and Interpersonal Skills
Mapped to TEL/N9102

Terminal Outcomes:

- Develop communication skills, interpersonal skills and sensitization towards gender and persons with disability

Duration: *10:00*	**Duration**: *20:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the roles and responsibilities and understand organisation's policies • Discuss the organisational guidelines for dress code, time schedules, language and other soft skill aspects • Discuss the importance of reporting unforeseen disruptions or delays • Explain how to give and receive feedback in a constructive way • List the different methods of communication • Explain the importance of effective communication and interpersonal skills • Discuss how to listen attentively and respond appropriately • Describe the common reasons for interpersonal conflicts and ways of managing them effectively • List the different types of information needed by colleagues and their importance • Discuss the importance of implementing standards, guidelines and practices pertaining to gender sensitivity, including work ethics and workplace etiquette • Discuss about the different types of disabilities along with their respective issues • Explain work ethics, workplace etiquette as well as standards and guidelines for all genders and PwD • List health and safety requirements for persons with disability • Describe the rights, duties and benefits available at workplace for persons with disability • Explain the process of recruiting people with disability for a specific job	• Demonstrate how to interact with superiors in terms of escalating problems, reporting work completion and receiving feedback • Apply team building skills to assist colleagues in maximising effectiveness and efficiency of carrying out tasks • Demonstrate appropriate communication skills and etiquette while interacting with others • Resolve conflicts with colleagues and adhere to commitment • Demonstrate ideal workplace ethics while interacting with colleagues with respect to sharing information, co-ordinating work and showing respect • Follow organisation's policy for working with team members • Illustrate importance of team goals over individual goals • Use inclusive language irrespective of the gender/ disability of the person • Demonstrate appropriate behaviour towards all genders and differently abled people

• Discuss the specific ways to help persons with disability overcome the challenges	
Classroom Aids:	
White board/ black board marker / chalk, duster, computer or laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

Module 9: On-the-Job Training

Mapped to Telecom Surface Mount Technology (SMT) Technician

Mandatory Duration: *120:00*	**Recommended Duration:** *00:00*
Location: On-Site	

Terminal Outcomes

1. Drawing correct components from the store by understanding different types of electronic parts/ components
2. Explain the impact of moisture on PCBs and relevance of baking
3. Explain the importance of selecting soldering paste with desired characteristics
4. Demonstrate the relevance of proper thawing of soldering paste, cleaning of stencils and even application of soldering paste on the PCB
5. Explain the impact of temperature and humidity on the process
6. Explain the impact of proper alignment and supporting of screen by proper locating of support pins
7. Demonstrate the operation of screen-printing machine
8. Importance of proper stowage of consumables
9. Quality requirements of PCBs like warpage issues/ fiducial mark availability etc.
10. Understand System specifications, part/ pattern numbers and Bill of Material
11. Demonstrate operating parameters of component placement machines/equipment
12. Understand of Gerber and x-y co-ordinate data
13. Demonstrate operations cycle of the component placement machine/ equipment
14. Check correct placement and connectivity (no bend pins/ legs etc.) reading/ verifying components under microscope
15. Demonstrate ESD precautions and hygiene
16. Type of SMT defects like tombstone and solder short
17. Demonstrate solder characteristic at various temperature points
18. Demonstrate the effects of non-compliance of solder characteristic on the PCB performance
19. Set of re-flow machine chamber temperature and PCB carrying belt speed to meet the desired characteristic.
20. Demonstrate the effects of dry solder, cracked joints, voids, uneven reflow and delamination of PCB
21. Demonstrate the use of cleaning chemicals/ solvents for PCBs
22. Demonstrate the process of cleaning
23. Demonstrate the use of vapor de-freezer equipment for PCB cleaning
24. Perform QA/QC parameters relating to the manual soldering
25. IPC standards of soldering

Module 10: DGT/VSQ/N0102 Employability Skill (60 hours)

Mapped to Telecom Surface Mount Technology (SMT) Technician

Mandatory Duration: *60:00*			
Location: On-Site			
S.No.	**Module Name**	**Key Learning Outcomes**	**Duration (hours)**
1.	Introduction to Employability Skills	• Discuss the Employability Skills required for jobs in various industries. • List different learning and employability related GOI and private portals and their usage.	1.5
2.	Constitutional values - Citizenship	• 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. • Show how to practice different environmentally sustainable practices.	1.5
3.	Becoming a Professional in the 21st Century	• Discuss importance of relevant 21st century skills. • 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. • Describe the benefits of continuous learning.	2.5
4.	Basic English Skills	• Show how to use basic English sentences for every day. conversation in different contexts, in person and over the telephone. • Read and interpret text written in basic English • Write a short note/paragraph / letter/e -mail using basic English.	10
5.	Career Development & Goal Setting	• Create a career development plan with well-defined short- and long-term goals.	2
6.	Communication Skills	• Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. • Explain the importance of active listening for effective communication. • Discuss the significance of working collaboratively with others in a team.	5
7.	Diversity & Inclusion	• Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD. • Discuss the significance of escalating sexual harassment issues as per POSH act.	2.5
8.	Financial and Legal Literacy	• Outline the importance of selecting the right financial institution, product, and service. • Demonstrate how to carry out offline and online financial transactions, safely and securely. • List the common components of salary and compute income, expenditure, taxes, investments etc. • Discuss the legal rights, laws, and aids.	5
9.	Essential Digital Skills	• Describe the role of digital technology in today's life.	10

		• Demonstrate how to operate digital devices and use the associated applications and features, safely and securely. • Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely. • Create sample word documents, excel sheets and presentations using basic features. • Utilize virtual collaboration tools to work effectively.	
10.	Entrepreneurship	• Explain the types of entrepreneurship and enterprises. • Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan. • Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement. • Create a sample business plan, for the selected business opportunity.	7
11	Customer Service	• Describe the significance of analyzing different types and needs of customers. • Explain the significance of identifying customer needs and responding to them in a professional manner. • Discuss the significance of maintaining hygiene and dressing appropriately.	5
12	Getting Ready for Apprenticeship & Jobs	• Create a professional Curriculum Vitae (CV). • Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively. • Discuss the significance of maintaining hygiene and confidence during an interview. • Perform a mock interview. • List the steps for searching and registering for apprenticeship opportunities.	8

LIST OF TOOLS & EQUIPMENT FOR EMPLOYABILITY SKILLS		
S No.	**Name of the Equipment**	**Quantity**
1.	Computer (PC) with latest configurations – and Internet connection with standard operating system and standard word processor and worksheet software (Licensed) (all software should either be latest version or one/two version below)	As required
2.	UPS	As required
3.	Scanner cum Printer	As required
4.	Computer Tables	As required
5.	Computer Chairs	As required
6.	LCD Projector	As required
7.	White Board 1200mm x 900mm	As required
Note: Above Tools &Equipment not required, if Computer LAB is available in the institute.		

Annexure

Trainer Requirements (*Telecom Surface Mount Technology (SMT) Technician)*

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Graduate	Science/Electrical/ Electronics/IT and other relevant fields	1	Handset Assembling	0	NA	Eligible for ToT Program
Diploma after Class 10th	Science/Electrical/ Electronics/IT and other relevant fields	4	Handset Assembling	0	NA	Eligible for ToT Program

Trainer Certification	
Domain Certification	**Platform Certification**
Certified in Job Role: "**Telecom Surface Mount Technology (SMT) Technician" - Level 4**" "**TEL/Q2501, v2.0**", Minimum accepted score is **80%.**	Certified in Job Role: Job Role: "**Trainer" "MEP/Q2601**", Minimum accepted score is **80%.**

Assessor Requirements (*Telecom Surface Mount Technology (SMT) Technician)*

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI/Diploma	Science/ Electrical/Electronics/ IT and other relevant fields	1	Telecom	1	Handset Assembling	Eligible for ToA Program

Assessor Certification	
Domain Certification	**Platform Certification**
Certified in Job Role: "**Telecom Surface Mount Technology (SMT) Technician" - Level 4**" "**TEL/Q2501, v2.0**", Minimum accepted score is **80%.**	Certified in Job Role: Job Role: "**Assessor" "MEP/Q2701**", Minimum accepted score is **80%.**

Trainer Requirements (Employability Skills 60 hours)

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Graduate/CITS	Any discipline			2	Teaching experience	Prospective ES trainer should: • have good communication skills • be well versed in English • have digital skills • have attention to detail • be adaptable • have willingness to learn
Current ITI trainers	Employability Skills Training (3 days full-time course done between 2019-2022)					
Certified current EEE trainers (155 hours)	from Management SSC (MEPSC)					
Certified Trainer	Qualification Pack: Trainer (MEP/Q0102)					

Trainer Certification	
Domain Certification	**Platform Certification**
Certified in 60-hour Employability NOS (2022), with a minimum score of 80% OR Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of 80%	NA

Master Trainer Requirements (Employability Skills 60 hours)

Master Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Graduate/CITS	Any discipline			3	Employability Skills curriculum training experience with an interest to train as well as orient other peer trainers	Prospective ES Master trainer should: • have good communication skills • be well versed in English • have basic digital skills • have attention to detail • be adaptable • have willingness to learn • be able to grasp concepts fast and is creative with teaching practices and likes sharing back their learning with others
Certified Master Trainer	Qualification Pack: Master Trainer (MEP/Q2602			3	EEE training of Management SSC (MEPSC) (155 hours)	

Master Trainer Certification	
Domain Certification	**Platform Certification**
Certified in 60-hour Employability NOS (2022), with a minimum score of **90%.** **OR** Certified in 120-, 90-hour Employability NOS (2022), with a minimum score of **90%**	NA

Assessment Strategy

1. Assessment System Overview:
    - Batches assigned to the assessment agencies for conducting the assessment on SDSM/SIP or email
    - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
    - Assessment agency deploys the ToA certified Assessor for executing the assessment
    - SSC monitors the assessment process & records

2. Testing Environment:
    - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
    - Check the duration of the training.
    - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
    - If the batch size is more than 30, then there should be 2 Assessors.
    - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
    - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
    - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
    - Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:
    - Question papers created by the Subject Matter Experts (SME)
    - Question papers created by the SME verified by the other subject Matter Experts
    - Questions are mapped with NOS and PC
    - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
    - Assessor must be ToA certified & trainer must be ToT Certified
    - Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:
    - Time-stamped & geotagged reporting of the assessor from assessment location
    - Center photographs with signboards and scheme specific branding
    - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
    - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:
    - Surprise visit to the assessment location
    - Random audit of the batch
    - Random audit of any candidate

6. Method for assessment documentation, archiving, and access
    - Hard copies of the documents are stored
    - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
    - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

Assessment Strategy (Employability Skills 60 hours)

The trainee will be tested for the acquired skill, knowledge and attitude through formative/summative assessment at the end of the course and as this NOS and MC is adopted across sectors and qualifications, the respective AB can conduct the assessments as per their requirements.

References

Glossary

Term	Description
Sector	Sector is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job Role	Job role defines a unique set of functions that together form a unique employment opportunity in an organization.
OS	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the knowledge and understanding they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do **upon the completion of the training**.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do **upon the completion of a module.** A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
SOP	Standard Operating Procedures
SMT	Surface Mount Technology
BGA	Ball Grid Array
SMT	Surface Mount Technology
PCB	Printed Circuit Board
ICs	Integrated Circuits
MSDS	Material Safety Data Sheet
ESD	Electrostatic discharge
QA	Quality Assurance
QC	Quality Checks
SHE	Safety, Health and Environment
OHS	Occupational Health and Safety
ES	Employability Skills