Model Curriculum

QP Name: Cabling Technician

QP Code: IAS/Q5603

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

Instrumentation Automation Surveillance & Communication Sector Skill Council
201-202 STBP NSIC Complex (Gate No. 02), Okhla Industrial Area, New Delhi-110020

Table of Contents

Training Parameters

Sector	Instrumentation Automation Surveillance and Communication
Sub-Sector	Instrumentation and Automation
Occupation	Installation and Commissioning
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/NIL
Minimum Educational Qualification & Experience	ITI (Electronics/Electrician/Wireman)/ 12th Pass
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	21/01/2020
Next Review Date	21/01/2025
NSQC Approval Date	
Version	1.0
Model Curriculum Creation Date	21/01/2020
Model Curriculum Valid Up to Date	21/01/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	252 Hours, 0 Minutes
Maximum Duration of the Course	252 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.

- Identify the role, responsibilities and scope of work of a cabling technician
- Demonstrate knowledge of different types of cables
- Plan, layout and connect different types of cables
- Demonstrate working effectively in a team
- Follow the safety procedures

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
Introduction to the Role of a Cabling Technician *Bridge Module*	20:00	00:00			20:00
IAS/N5609 - Plan, lay and connect/terminate different types of cables **NOS Version No. 1.0** **NSQF Level 4**	**30:00**	**80:00**			**110:00**
Perform Cabling	30:00	80:00			110:00
IAS/N9001 Work effectively with teams **NOS Version No. 1.0** **NSQF Level 4**	25:00	36:00			61:00
Soft Skills and Work Ethics	25:00	36:00			61:00
IAS/N9002 - Health and safety in workplace **NOS Version No. 1.0** **NSQF Level 4**	**25:00**	**36:00**			**61:00**
Basic Health and Safety Practices	25:00	36:00			61:00
Total Duration	**100:00**	**152:00**			**252:00**

Module Details

Introduction to the Role of a Cabling Technician

Terminal Outcomes:

- Identify the role, responsibilities and scope of work of a cabling technician

Duration: *20:00*	**Duration**: *00:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Describe the role and responsibilities of a cabling technician - Define the purpose of cabling - Explain the different types of cabling - List the workflow and procedures involved in cabling - Identify the sectors where cabling is prominently performed - Distinguish between the types of cables based on their characteristics, current ratings and respective usage	NA
Classroom Aids:	
White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Different types of cables	

Perform Cabling
Mapped to IAS/N5609

Terminal Outcomes:

- Demonstrate the steps to perform cabling as per design

Duration: *30:00*	Duration: *80:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Define cabling, wiring, connected equipment and plant/site layout along with their relevant documents - List the site conditions that can impact the cabling work - Identify the drawings, wire colour codes, conduits and routes of cables - Check the layout drawing for concealed conduits and their routes - Comply with the approved standard operating procedures for laying, routing and conduiting - List the types of material required for laying, routing and conduiting such as raceways, conduits, seals, etc. and the authorised sources to obtain the same - List the tools, equipment and accessories to be used for cabling - Identify the methods to calculate: - Length of raceways, cable trays, conduits required for each section of cabling - Total material required w.r.t. length of cables, types of cables, conduits, tools, electrical parts, testing devices and accessories - Identify the use of junction boxes / panels, different tools and equipment to carry out the cabling work - Explain the importance of using Personal Protective Equipment (PPE) w.r.t specified work - Illustrate the importance of complying with the rules and regulations as well as standards and practices of instrumentation cabling and low voltage power cabling	- Create plan for: - Laying cables on the wall w.r.t. the layout drawing - Routing of instrumentation cables - Conduiting as per the laying and routing of cables - Demonstrate testing and using the cabling tools such as crimping tools, splicing tools and testing equipment - Prepare total material required w.r.t. conduits, tools, electrical parts, testing devices and accessories, as per the calculation performed - Demonstrate the step-by-step process to check copper LAN cables, fibre LAN cables, connectors and accessories used - Demonstrate verifying the concealed conduits and routes, in case of low voltage power cable, CCTV cable, copper/fibre LAN cable - Demonstrate marking the position for drilling of holes in the structure to install raceways, cable trays and conduits w.r.t. drawing - Demonstrate running the cables through the conduits / raceways and routing them to respective junction boxes / panels - Illustrate stripping the outer covering of the cables appropriately and routing their stripped end to the appropriate terminals / target devices - Illustrate sealing of conduit ends using approved material - Demonstrate connecting the cables and performing their continuity check - Demonstrate using standard ferrules for marking all individual wires for identification and tying them using the cable ties

	• Test the shielded cable testing equipment to ensure the shield connection with specific terminal
	• Demonstrate terminating cables on appropriate connectors and plugging connectors to the devices
	• Develop a checklist, as per recommended procedure, to verify the wiring w.r.t the plan
	• Use the best suitable PPE to carry out the work

Classroom Aids:

White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector

Tools, Equipment and Other Requirements

Plant layout drawing, drilling tool, PPE, low voltage power cable, CCTV cable, copper/fibre LAN cable, connectors

Raceways, conduits, standard ferrules, tools and equipment to perform stripping, crimping and soldering

Cable testing equipment

Soft Skills and Work Ethics
Mapped to IAS/N9001

Terminal Outcomes:

- Work effectively at the workplace

Duration: *25:00*	Duration: *36:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain the importance of working towards team objectives and goals - Identify the code of conduct towards team members w.r.t. their culture, preferences, roles and responsibilities - Identify the importance of effective communication and interpersonal skills - Identify the common reasons for interpersonal conflicts and ways of managing them effectively - Identify the importance of standard operating procedures of the company w.r.t. privacy, confidentiality and security - Identify the issues with process flow improvements, quality of output, product defects received from previous process, repairs and maintenance of tools and machinery and handle them - Identify the need for implementing standards, guidelines and practices pertaining to gender sensitivity, including work ethics and workplace etiquettes - Identify the need for implementing standards, guidelines and practices pertaining to sensitivity towards Persons with Disabilities (PwD) - Explain the specific ways to help persons with disability overcome the challenges - List organisational guidelines for dress code, time schedules, language and other soft skill aspects	- Apply team building skills and assist colleagues to maximise effectiveness and efficiency in carrying out tasks - Apply appropriate communication skills and etiquettes while interacting with others - Demonstrate use of inclusive language irrespective of disability and the gender of the person - Demonstrate active listening skills while communicating - Illustrate how to interact with supervisor to receive instructions and report problems that need escalation - Demonstrate ideal workplace ethics while interacting with colleagues - Demonstrate working effectively with colleagues by assisting them whenever required - Illustrate appropriate behaviour towards all genders and differently abled people
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.	

Basic Health and Safety Practices
Mapped to IAS/N9002

Terminal Outcomes:

- Apply health and safety practices at the workplace

Duration: *25:00*	**Duration**: *36:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain the importance of health and safety guidelines - List the components of a basic first-aid kit, safety tools and equipment - Identify the practices for maintaining safe and secure workplace - List the precautions for handling different types of cables and electrical equipment - List the daily safety instructions and the other recommended safety procedures for work—before starting work, while working, after finishing work - Describe the safety drills and health related activities scheduled in the organisation - Identify the types of fire and use correct fire extinguishers - Identify the general safety procedures and standard safety procedures for handling tools, equipment and hazardous materials - Identify the importance of good postures for lifting heavy objects - Explain the importance of efficient utilisation of material and water - Identify common practices of conserving electricity - List the common sources of pollution and ways to minimise it - Describe the concept of waste management and methods of waste disposal - List the different categories of waste for the purpose of segregation	- Apply methods of accident prevention in the work environment - Demonstrate using proper techniques for disposal of hazardous chemicals, tools and materials by following prescribed environmental norms or as per company policy - Report any abnormal situation/behaviour of any equipment/system to relevant authorities - Apply emergency rescue techniques during fire hazard - Apply first aid and bandage to victims - Illustrate the steps to free a person from electrocution, and artificial respiration and the CPR Process - Demonstrate correct use of fire extinguishers at the time of emergency - Illustrate the administration of basic first-aid at the time of emergency - Use defined emergency procedures such as raising alarm, safe/efficient, evacuation, correct means of escape and so on - Use protective equipment suitable to tasks and work conditions - Demonstrate correct posture while sitting, standing, and handling heavy materials - Comply with the procedures for minimising waste and processes specified for disposal of hazardous waste
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

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
12th pass	Cabling	3	Cabling	2-3	Cabling	NA

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Cabling Technician" mapped to QP: "IAS/Q5603". Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601" with scoring of minimum 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
12th pass	Cabling	3	Cabling	2-3	Cabling	NA

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Cabling Technician" mapped to QP: "IAS/Q5603". Minimum accepted score is 80%	Recommended that the Assessor is certified for the Job Role: "Assessor", mapped to the Qualification Pack: "MEP/Q2701" with scoring of minimum 80%.

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