Model Curriculum

QP Name: Assistant Robotics Technician

(Introduction)

QP Code: ELE/Q7203

QP Version: 1.0

NSQF Level: 3

Model Curriculum Version: 1.0

Electronics Sector Skills Council of India || 155, 2nd Floor, ESC House, Okhla Industrial Area - Phase3, New Delhi – 110020

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Assistant Robotics Technician (Introduction)

Training Parameters

Sector	Electronics
Sub-Sector	Industrial Automation
Occupation	After Sales Service- I& A
Country	India
NSQF Level	3
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3139.1400
Minimum Educational Qualification and Experience	10th grade pass OR 9th grade pass with 1 year of relevant Experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	NA
Next Review Date	31/01/2027
NSQC Approval Date	31/01/2024
QP Version	1.0
Model Curriculum Creation Date	
Model Curriculum Valid Up to Date	
Model Curriculum Version	1.0
Maximum Duration of the Course	420 Hours

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.

- Carry Out setup and testing of a robotics system
- Technical Assistant by Conducting Troubleshooting
- Entrepreneur of Robot Training Academy
- Robot Instructor
- Robot Assistant Technician

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
ELE/N3174: Carry out setup of small-scale robotics system	**36:00**	**69:00**	**45:00**	**00:00**	**150:00**
Module 1: Set up	36:00	69:00	45:00	00:00	150:00
ELE/N3175: Testing of small-scale robotics system	**45:00**	**90:00**	**45:00**	**00:00**	**180:00**
Module 2: Testing	45:00	90:00	45:00	00:00	180:00
DGT/VSQ/N0102 - Employability Skills (60 Hours)	**24:00**	**36:00**	**00:00**	**00:00**	**60:00**
Module 3: Employability Skills (60 Hours)	24:00	36:00	00:00	00:00	60:00
ELE/N9972 – Work Effectively at the Workplace	**15:00**	**15:00**	**00:00**	**00:00**	**30:00**
Module 4: Soft Skills and Work Ethics	15:00	15:00	00:00	00:00	30:00
Total Duration	**120:00**	**210:00**	**90:00**	**00:00**	**420:00**

Module Details

Module 1: Setup

Mapped to ELE/N3174

Terminal Outcomes:

- Describe the Overall theoretical understanding of Robots

Duration: *36:00*	**Duration**: *69:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the basic principles governing the Alternating Current, Direct Current (DC) and electronic circuits. • Explain the use of various types of electronic components such as a resistor, capacitors, coil, diode, transistor, integrated circuit (IC) etc. • Explain the importance of following safety and quality standards.	• Describe various tests and procedures for checking a Robot • List various tools and equipment required for the repair and maintenance of a Robot • Demonstrate the process of conducting a preliminary check on a Robot to determine the repair or replacement needs of its modules. • Demonstrate the procedure of assembling/ disassembling different types of Robot
Classroom Aids:	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Robot Kit	

Module Details

Terminal Outcomes:

- Describe the Overall theoretical understanding of Robots

Duration: *45:00*	Duration: *90:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the functions of various components such as Rover, Arm etc. • Describe the process of installing various electronic components in a Robot • Explain the relevant troubleshooting methods for various types of Robots • Describe the standard procedure for repairing and replacing any faulty components of a Robot	• Demonstrate how to conduct various tests for identifying faulty electronic components in a Robot • Demonstrate the relevant troubleshooting and maintenance procedures for different components of a Robot • Demonstrate the process of installing various electronic components in a Robot. • Prepare a sample repair and maintenance report using the relevant computer system.
Classroom Aids:	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Robot Kit	

Module 3: Employability Skills (60 Hours)

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Discuss about Employability Skills in meeting the job requirements
- Describe opportunities as an entrepreneur.
- Describe ways of preparing for apprenticeship & Jobs appropriately.

Duration: *24:00*	Duration: *36:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- Explain constitutional values, civic rights, responsibility towards society to become a responsible citizen - Discuss 21st century skills - Explain use of basic English phrases and sentences. - Demonstrate how to communicate in a well-behaved manner - Demonstrate how to work with others - Demonstrate how to operate digital devices - Discuss the significance of Internet and Computer/ Laptops - Discuss the need for identifying business opportunities - Discuss about types of customers. - Discuss on creation of biodata - Discuss about apprenticeship and opportunities related to it.	- List different learning and employability related GOI and private portals and their usage - Show how to practice different environmentally sustainable practices. - Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, etc. - Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone - Demonstrate how to communicate in a well -mannered way with others. - Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette - Utilize virtual collaboration tools to work effectively - Demonstrate how to maintain hygiene and dressing appropriately. - Perform a mock interview
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Computer, UPS, Scanner, Computer Tables, LCD Projector, Computer Chairs, White Board OR Computer Lab	

Assistant Robotics Technician (Introduction)

Skill India
कौशल भारत-कुशल भारत

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

Module 4: Soft Skills and Work Ethics

Mapped to ELE/N9972

Terminal Outcomes:

- Work effectively at the workplace.
- Implement the practices related to gender and PwD sensitization.

Duration: *15:00*	Duration: *15:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
- State the importance of work ethics and workplace etiquette - State the importance of effective communication and interpersonal skills. - Explain ways to maintain discipline at the workplace. - Discuss the common reasons for interpersonal conflict and ways of managing them effectively. - Discuss the importance of following organisational guidelines for dress code, time schedules, language usage and other behavioural aspects. - Explain the importance of working as per the workflow of the organisation to receive instructions and report problems. - Explain the importance of conveying information/instructions as per defined protocols to the authorised persons/team members. - Explain the common workplace guidelines and legal requirements on non-disclosure and confidentiality of business-sensitive information. - Describe the process of reporting grievances and unethical conduct such data breach, sexual harassment at the workplace, etc. - Explain the concept and importance of gender sensitivity and equality. - Discuss ways to create sensitivity for different genders and Persons with Disabilities (PwD).	- Develop a sample plan to achieve organisational goals and targets. - Create a sample feedback form to obtain feedback from customers, colleagues etc. - Roleplay to demonstrate the use of professional language and behaviour that is respectful of PwD and all genders. - Apply organisational protocol on data confidentiality and sharing only with the authorised personnel.

Assistant Robotics Technician (Introduction)

Classroom Aids
Training kit (Trainer guide, Presentations), White board, Marker, projector, laptop, flipchart.

Tools, Equipment and Other Requirements
Sample of escalation matrix, organisation structure.

Module 6: On-the-Job Training

Mapped to Assistant Robotics Technician (Introduction)

Mandatory Duration: 90:00	Recommended Duration: 00:00
Location: On Site	

Terminal Outcomes
1. Explain the fundamental concept of a Robot
2. Illustrate the preliminary tasks involve in the testing and maintenance of a Robot
3. Demonstrate how to perform preliminary checks on a Robot
4. Demonstrate how to carry out troubleshooting for different issues in a Robot
5. Test functioning of the Robot post servicing
6. Interact and coordinate with supervisor and colleagues
7. Perform assigned work within timelines and with defined quality
8. Demonstrate how to maintain a healthy, safe and secure working environment

Annexure

Trainer Requirements

<table>
<tr><td colspan="7" align="center">Trainer Prerequisites</td></tr>
<tr>
<td rowspan="2">Minimum Educational Qualification</td>
<td rowspan="2">Specialization</td>
<td colspan="2">Relevant Industry Experience</td>
<td colspan="2">Training Experience</td>
<td rowspan="2">Remarks</td>
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<tr>
<td>Years</td>
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<td>Electrical/ Electronics/ Mechanical</td>
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<td>Relevant Industry</td>
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<tr>
<td>Diploma/ITI</td>
<td>Electrical/ Electronics/ Mechanical</td>
<td>2</td>
<td>Relevant Industry</td>
<td>1</td>
<td>Training</td>
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<tr>
<td>Certified in relevant CITS Trade</td>
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<table>
<tr><td colspan="2" align="center">Trainer Certification</td></tr>
<tr>
<td align="center">Domain Certification</td>
<td align="center">Platform Certification</td>
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<tr>
<td>"Assistant Robotics Technician (Introduction), ELE/QXXXX, version 1.0". Minimum accepted score is 80%.</td>
<td>Recommended that the Trainer is certified for the Assistant Robotics Technician (Introduction) "Trainer (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2601, V2.0", with minimum score of 80%</td>
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Assessor Requirements

<table>
<tr><td colspan="7" align="center">Assessor Prerequisites</td></tr>
<tr>
<td rowspan="2">Minimum Educational Qualification</td>
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<td colspan="2">Training/Assessment Experience</td>
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<tr>
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<td>3</td>
<td>Relevant Industry</td>
<td>2</td>
<td>Training</td>
<td></td>
</tr>
</table>

Assistant Robotics Technician (Introduction)

Certified in relevant CITS Trade						

Assessor Certification	
Domain Certification	**Platform Certification**
"Assistant Robotics Technician (Introduction), ELE/QXXXX, version 1.0". Minimum accepted score is 80%.	Recommended that the Assessor is certified for the Assistant Robotics Technician (Introduction) "Assessor (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2701, V2.0", with minimum score of 80%

Assessment Strategy

1. Assessment System Overview:
   - Batches assigned to the assessment agencies for conducting the assessment on SDMS/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
- Centre 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

Glossary

Sector	Sector is a conglomeration of different business operations having similar business 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 organisation.
Occupational Standards (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 (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.

Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.

Acronyms and Abbreviations

Assistant Robotics Technician (Introduction)

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
IPR	Intellectual Property Rights