



Model Curriculum

QP Name: Advanced Mechatronics Engineer

QP Code: CSC/Q0414

Version: 1.0

NSQF Level: 5.5

Model Curriculum Version: 1.0

Capital Goods and Strategic Skill Council
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Training Parameters

Sector	Capital Goods & Strategic Skill Council
Sub-Sector	Machine Tools, Dies, Moulds and Press Tools, Plastics Manufacturing Machinery, Textile Manufacturing Machinery, Process Plant Machinery, Electrical and Power Machinery, Light Engineering Goods, Defence Equipment, Fire Fighting & Safety Equipment
Occupation	Design
Country	India
NSQF Level	5.5
Aligned to NCO/ISCO/ISIC Code	2144.99
Minimum Educational Qualification and Experience	UG Degree in relevant field + 2 years of relevant experience or 3 Years UG Degree in Science and Technology (B.Sc / BCA) / 4 years BE, B.Tech (Electrical, Electronics, Mechanical, Mechatronics, Instrumentation and Control)* or 10th grade pass +3 years Diploma in relevant field + 5 year of relevant experience or Previous NSQC level 5 + 1.5 years of relevant experience *Subject to being offered as 6 months internship/ project
Pre-Requisite License or Training	NA
Minimum Job Entry Age	24 Years
Last Reviewed On	31 st January 2024
Next Review Date	31 st January 2027
NSQC Approval Date	31 st January 2024
QP Version	1.0
Model Curriculum Creation Date	31 st January 2024
Model Curriculum Valid Up to Date	30 January 2027
Model Curriculum Version	1.0
Minimum Duration of the Course	570 Hours

Maximum Duration of the Course	570 Hours
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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 to:

- Process of setting up circuits and electrical components in the mechatronics system
- Align, test electronic sensors and actuators in the mechatronics system
- Configure and test the microcontroller in the mechatronics system
- Collaboratively work with different stake holders at the workplace
- Implement hygiene, health and safety practices at the workplace.

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
CSC/N0507: Configure and install electronic components in the mechatronic systems	45:00	75:00	30:00	00:00	120:00
NOS Version- 1.0 NSQF Level- 6					
Module 1: Introduction to the role of an Advanced Mechatronics Engineer	05:00	00:00	0:00	00:00	05:00
Module 2: Perform setting up circuits and electrical components in the mechatronics system	40:00	75:00	30:00	00:00	115:00
CSC/N0508: Aligning and testing electronic sensors and actuators in the mechatronics system.	35:00	55:00	30:00	00:00	120:00
NOS Version-1.0 NSQF Level- 6					
Module 3: Aligning and testing electronic sensors and actuators in the mechatronics system.	35:00	55:00	30:00	00:00	120:00

CSC/N0424: Configure and test the microcontroller in the mechatronics system NOS Version- 1.0 NSQF Level- 6	35:00	55:00	30:00	00:00	120:00
Module 4: Configure and test the microcontroller in the mechatronics system	35:00	55:00	30:00	00:00	120:00
CSC/N1339: Collaboratively work with different stakeholders at the workplace NOS Version- 1.0 NSQF Level- 6	35:00	55:00	0:00	00:00	90:00
Module 5: Collaboratively work with different stake holders at the workplace	35:00	55:00	0:00	00:00	90:00
CSC/N0505: Health, Safety and Environment at workplace NOS Version- 1.0 NSQF Level- 6	10:00	20:00	00:00	00:00	30:00
Module 9: Health, Safety and Environment at workplace	10:00	20:00	00:00	00:00	30:00
DGT/VSQ/N0102 - Employability Skills (60 hours) NOS Version No. – 1.0 NSQF Level – 5	20:00	40:00	00:00	00:00	60:00
Module 10: Introduction to Employability Skills	20:00	40:00	00:00	00:00	60:00
Total Duration	180:00	300:00	90:00	00:00	570:00

Module Details

Module 1: Introduction to the role of an Advanced Mechatronics Engineer

Bridge Module, Mapped to CSC/N0507, v1.0

Terminal Outcomes:

- Discuss introduction to the role of an Advanced Mechatronics Engineer.

Duration: 05:00	Duration: 0:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the size and scope of the capital good industry and its sub-sectors. • Discuss the role and responsibilities of an Advanced Mechatronics Engineer. • Identify various employment opportunities for an Introduction to the role of an Advanced Mechatronics Engineer. 	
Classroom Aids	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
Tools, Equipment and Other Requirements	
NA	

Module 2: Perform setting up circuits and electrical components in the mechatronics system *Bridge module, Mapped to CSC/N0507, v1.0*

Terminal Outcomes:

- Demonstrate the process of Setting up microcontrollers.
- Demonstrate the process of Setting up circuits, electrical components and pneumatic systems.

Duration: 40:00	Duration: 75:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the need and scope of the mechatronics system. • Explain the mechatronics system and its scope in the automation sector. • Explain the traditional vs conventional mechatronics approach. • Explain how to interpret the block diagram representation of a general mechatronics system showing various components with suitable examples. • Explain relevant control systems such as open and closed-loop systems, basic elements of the closed-loop system. • Explain the basic circuit concepts. • Explain the semiconductor circuit elements. • Explain different types of circuits used in mechatronic devices. • Explain how to interpret the symbols used in pneumatic systems. • Describe the function and operation of pneumatic valves. • Describe the logic functions used in the pneumatic system. • Describe the function of relays and their working in the pneumatic system. • Explain the need for the proximity sensor and its application in a pneumatic cylinder. 	<ul style="list-style-type: none"> • Demonstrate the process of testing the mechatronics components to ensure they are functioning correctly. • Demonstrate the process of installing the mechatronics control system and the hardware interfacing units of microcontrollers. • Demonstrate the process of testing the microcontrollers for the correct functioning and carrying out troubleshooting for the issues identified. • Demonstrate how to test the electrical components and circuits for correct functioning and compatibility with the mechatronics system. • Demonstrate the process of performing sequence control and using the logic functions for operating the pneumatic system. • Demonstrate how to use relays in the pneumatic system. • Demonstrate how to monitor the pneumatic fluid by analyzing speed and pressure control sensors. • Demonstrate the process of carrying out troubleshooting for any issues encountered with the pneumatic system. • Demonstrate how to design the cascade circuits. • Demonstrate the process of installing the pneumatic power system. • Demonstrate the process of carrying

<ul style="list-style-type: none"> • Explain the design of cascade circuits. • Describe the process of programming PLCs in the Ladder diagram. • Explain the principles of operation, characteristics and applications of power semiconductor devices. • Explain the characteristics of power semiconductor devices and circuits. • Explain the concept of fluid power. • Explain the relevant case studies for implementing the pneumatic system in the automatic production line. 	<p>out maintenance of the circuits, electrical components, and pneumatic system.</p>
Classroom Aids	
<p>Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator’s Guide, Participant’s Handbook.</p>	
Tools, Equipment and Other Requirements	
<p>Test Instruments Such as Oscilloscopes, Electronic Voltmeters and Bridges, Computer and Software, Control Hardware, Sensors and Actuators, Robotics Components, Communication Devices, Test and Measurement Equipment, Power Supplies, Networking Equipment, Machine Shop Tools, Safety Equipment, Diagnostic and Calibration Tools, Toolkits.</p>	

Module 3: Align and test electronic sensors and actuators in the mechatronics system

Bridge module ,Mapped to NOS CSC/N0508 v1.0

Terminal Outcomes:

- Demonstrate the process of installing, testing and using the sensors and actuators.

Duration: 35:00	Duration: 55:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the use of contact and non-contact type sensors. • Explain the functions and application of Potentiometer Sensors, Strain Gauge elements, Capacitive • Elements, Eddy Current, Pressure Sensors, Pneumatic, Pyro Electrical, Piezo Electric Sensors etc. • Explain the criteria for selecting sensors for use. <ul style="list-style-type: none"> • Explain the classification, need and scope of different types of actuators. • Describe the process of pneumatic actuation, hydraulic actuation and double-acting. • Explain the use of different types of motors such as vane motors. • Explain the components of electrical actuation systems such as switching devices, keypads, electromechanical and solid-state relays, stepper motors etc. • Explain the criteria for the selection of different types of actuators. • Explain how to carry out repair and maintenance of sensors and actuators in a mechatronics system. 	<ul style="list-style-type: none"> • Demonstrate the process of installing the selected sensors such as the potentiometer sensor following the standard procedure. • Demonstrate how to test the sensors for correct functioning after installation. • Demonstrate how to check the working of the strain gauge sensor and measure the torque applied by the motor. • Demonstrate the use of an eddy current sensor. • Demonstrate how to use the capacitive element by replacing the mechanical buttons. • Demonstrate how to use the inductive sensor to measure high precision measurements of displacement, distance, oscillation in harsh industrial environments. • Demonstrate the use of the pneumatic and pyro-electric and piezoelectric sensors. • Demonstrate the process of carrying out repair and maintenance of sensors. • Demonstrate the process of installing an actuator with the appropriate properties according to the need • Demonstrate how to use the appropriate interface circuitry to match the actuator to the system driving it. • Demonstrate how to test the actuator for correct functioning after installation. • Demonstrate the process of carrying out troubleshooting for any issues identified with the installed hydraulic and pneumatic actuator as per the sketches and block diagrams. • Demonstrate the process of install and using the vane motor as per the standard procedure. • Demonstrate how to control a high- powered circuit using a lower power signal through

	electro-mechanical and solid-state relays. <ul style="list-style-type: none"> • Demonstrate how to use the stepper motor to convert electrical power into mechanical power. • Demonstrate how to create analytical design and development solutions for actuators for different applications. • Demonstrate the process of carrying out repair and maintenance of actuators.
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Test Instruments Such as Oscilloscopes, Electronic Voltmeters and Bridges, Computer and Software, Control Hardware, Sensors and Actuators, Robotics Components, Communication Devices, Test and Measurement Equipment, Power Supplies, Networking Equipment, Machine Shop Tools, Safety Equipment, Diagnostic and Calibration Tools, Toolkits.	

Module 4: Configure and test the microcontroller in the mechatronics system

Bridge module, Mapped to CSC/N0424 v1.0

Terminal Outcomes:

- Demonstrate the process of installing, testing and using the microcontroller.

Duration: 35:00	Duration: 55:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain different applications of mechatronic systems. • Explain the structure of different types of microcontrollers and their PIN configuration. • Explain the difference between a microprocessor and a microcontroller. • Explain the advantages, disadvantages and applications of microcontrollers. • Explain the interfacing of D/A converters and A/D converters with microcontrollers. • Explain the application of temperature control stepper motor control. • Describe the function of microcontroller structure in hardware interfacing units of the mechatronics system. • State the instruction sets and programming concepts of microprocessor and microcontroller. • State the programming concepts to interface the hardware units with microprocessor and microcontroller. • Explain the architecture of PIN configuration, ARM Processor. • Explain the criteria for selecting an appropriate microcontroller. • Describe the process of digital analogue and vice versa converters in a microcontroller. 	<ul style="list-style-type: none"> • Demonstrate the process of installing the microcontroller as per the standard procedure and linking the function of the structure in hardware units of the mechatronics system. • Demonstrate how to test the microcontroller after installation to ensure it functions as expected. • Demonstrate how to program microcontroller to execute a specific set of instructions • Demonstrate the process of testing the functioning of the machine using the mechatronics system. • Demonstrate the process of carrying out interfacing of Analog-To-Digital (A/D) and Digital-To-Analog (D/A) converters using the appropriate type of microcontroller. • Demonstrate how to compose and program stepper motor using the appropriate type of microcontroller. • Demonstrate how to compose and program Advanced (ARM) and microprocessor with the stepper motor. • Demonstrate the process of carrying out repair and maintenance of microcontrollers.

<ul style="list-style-type: none"> • Describe the process of controlling the temperature with a temperature sensor using a microcontroller circuit. • Describe the process of interfacing experiments of A/D and D/A using the appropriate type of microprocessor. • Describe the process of interfacing and programming of Stepper motor using the appropriate type of microcontroller. • Describe the process of interfacing and programming of the ARM processor with a Stepper Motor. • Demonstrate how to carry out repair and maintenance of microcontrollers in the mechatronics system. 	
Classroom Aids	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
Tools, Equipment and Other Requirements	
Common Hand and Power Tools, Such as Hammers, Hoists, Saws, Drills and Wrenches, to Precision Measuring Instruments and electrical and Electronic Testing Device	

Module 5: Collaboratively coordinate with the stakeholders

Bridge module ,Mapped to CSC/N1339, v1.0

Terminal Outcomes:

- Create a collaborative and inclusive team environment conducive to effective communication and cooperation.
- Work cooperatively with team members, fostering a positive and productive atmosphere that contributes to achieving team goals.

Duration: 35:00	Duration: 55:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Define and explain the key concepts of team dynamics, including roles, norms, and communication patterns. • Discuss the importance of applying effective communication strategies within a team, considering various communication channels and styles. • Describe the components necessary for creating a positive and productive team environment in the context of a Data Analytics Engineer role. • Describe the importance of collaboration in the field of data analytics. • Define the role of each team member in the decision-making process. • Define and demonstrate a sense of responsibility in the context of a Data Analytics Engineer. 	<ul style="list-style-type: none"> • Conduct a practical team-building exercise to foster collaboration and teamwork. • Demonstrate the experience and identify strategies for building a cohesive team environment. • Participate in a communication simulation, considering various scenarios encountered in a data analytics team. • Receive feedback on communication effectiveness and adapt communication styles accordingly. • Work on a collaborative data analytics project, addressing real-world challenges. • Demonstrate the ability to effectively collaborate with team members to achieve project objectives. • Simulate decision-making scenarios specific to data analytics projects. • Contribute actively to decision-making processes and analyze the impact of decisions on project outcomes. • Take on specific responsibilities within the team, such as project management or task ownership. • Demonstrate a proactive approach to fulfilling responsibilities and meeting project deadlines. • Attend a diversity training workshop to gain insights into respecting diverse opinions, customs, and preferences. • Apply the knowledge gained to enhance collaboration within the team, considering cultural and professional diversity.

Classroom Aids

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop
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Tools, Equipment and Other Requirements
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Module 9: Maintain Health, Safety and Environment at workplace

Bridge module, Mapped to CSC/N0505, v1.0

Terminal Outcomes:

- Demonstrate ways to maintain personal health and safety.
- Describe the process of assisting in hazard management.
- Explain how to check the first aid box, firefighting and safety equipment.
- Describe the process of assisting in waste management.
- Explain the importance of following the fire safety guidelines.
- Explain the importance of following the emergency and first-aid procedures.
- Demonstrate the process of carrying out relevant documentation and review

Duration: 10:00	Duration: 20:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the recommended practices to be followed to ensure protection from infections and transmission to others, such as the use of hand sanitizer and face mask. • Explain the importance and process of checking the work conditions, assessing the potential health and safety risks, and take appropriate measures to mitigate them. • Explain the importance and process of selecting and using the appropriate PPE relevant to the task and work conditions. • Explain the recommended techniques to be followed while lifting and moving heavy objects to avoid injury. • Explain the importance of following the manufacturer's instructions and workplace safety guidelines while working on heavy machinery, tools and equipment. • Explain the importance and process of identifying existing and potential hazards at work. • Describe the process of assessing the potential risks and injuries associated with the various hazards. • Explain how to prevent or minimise different types of hazards. 	<ul style="list-style-type: none"> • Demonstrate the use of appropriate Personal Protective Equipment (PPE) relevant to the task and work conditions. • Demonstrate how to handle hazardous materials safely. • Demonstrate the process of testing the firefighting and various safety equipment to ensure they are in usable condition. • Demonstrate the process of recycling and disposing different types of waste appropriately. • Demonstrate how to use the appropriate type of fire extinguisher to extinguish different types of fires safely. • Demonstrate how to administer appropriate first aid to the injured personnel. • Demonstrate the process of performing Cardiopulmonary Resuscitation (CPR) on a potential victim of cardiac arrest. • Demonstrate the process of carrying out appropriate documentation following a health and safety incident at work, including all the required information.

- Explain how to handle and store hazardous materials safely.
- Explain the importance of ensuring the first aid box is updated with the relevant first aid supplies.
- Describe the process of checking and testing the firefighting and various safety equipment to ensure they are in a usable condition.
- Explain the criteria for segregating waste into appropriate categories.
- Describe the appropriate methods for recycling the recyclable waste.
- Describe the process of disposing of the non-recyclable waste safely and the applicable regulations.
- Explain the use of different types of fire extinguishers to extinguish different types of fires.
- State the recommended practices to be followed for a safe rescue during a fire emergency.
- Explain how to request assistance from the fire department to extinguish a serious fire.
- Explain the appropriate practices to be followed during workplace emergencies to ensure safety and minimise loss to organisational property.
- State the common health and safety hazards present in a work environment, associated risks, and how to mitigate them.
- State the safe working practices to be followed while working at various hazardous sites and using electrical equipment.
- Explain the importance of ensuring easy access to firefighting and safety equipment.
 Explain the appropriate preventative and remedial actions to be taken in the case of exposure to toxic materials, such as poisonous chemicals and gases.
- Explain various causes of fire in

different work environments and the recommended precautions to be taken to prevent fire accidents.

- Describe different methods of extinguishing fire.
- List different materials used for extinguishing fire.
- Explain the applicable rescue techniques to be followed during a fire emergency.
- Explain the importance of placing safety signs and instructions at strategic locations in a workplace and following them.
- Explain different types of first aid treatment to be provided for different types of injuries.
- State the potential injuries associated with incorrect manual handling.
- Explain how to move an injured person safely.
- State various hazards associated with the use of various machinery, tools, implements, equipment and materials.
- Explain the importance of ensuring no obstruction and free access to fire exits.
- Explain how to free a person from electrocution safely.
- Explain how to administer appropriate first aid to an injured person.
- Explain how-to perform Cardiopulmonary Resuscitation (CPR).
- Explain the importance of coordinating with the emergency services to request urgent medical assistance for persons requiring professional medical attention or hospitalisation.

State the appropriate documentation to be carried out following a health and safety incident at work, and the relevant information to be included.

<ul style="list-style-type: none"> • Explain the importance and process of reviewing the health and safety conditions at work regularly or following an incident. • Explain the importance and process of implementing appropriate changes to improve the health and safety conditions at work. 	
Classroom Aids	
Computer, Projection Equipment, PowerPoint Presentation and Software, Facilitator’s Guide, Participant’s Handbook.	
Tools, Equipment and Other Requirements	
Personal Protective Equipment, Cleaning Equipment and Materials, Sanitizer, Soap, Mask	

Module 10: Employability Skills

Bridge module, Mapped to DGT/VSQ/N0102 -Employability Skills (60 hours) v1.0

Terminal Outcomes:

- Discuss the Employability Skills required for jobs in various industries
- 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
- Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan

Duration: 20:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the Employability Skills required for jobs in various industries • List different learning and employability related GOI and private portals and their usage • 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 • Discuss importance of relevant 21st century skills. • Describe the benefits of continuous learning. • Explain the importance of active listening for effective communication • Discuss the significance of working collaboratively with others in a team • Discuss the significance of escalating sexual harassment issues as per POSH act. • List the common components of salary and compute income, expenditure, taxes, investments etc. • Discuss the legal rights, laws, and aids • Describe the role of digital technology in today's life • Discuss the significance of displaying responsible online behaviour while 	<ul style="list-style-type: none"> • Practice different environmentally sustainable practices. • Exhibit 21st century skills like Self-Awareness, Behaviour 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. • Demonstrate to use basic English sentences for everyday 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 • Create a career development plan with well-defined short- and long-term goals • Communicate effectively using verbal and nonverbal communication etiquette. • Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD • Outline the importance of selecting the right financial institution, product, and service • Demonstrate how to carry out offline and online financial transactions,

<p>browsing, using various social media platforms, e-mails, etc., safely and securely</p> <ul style="list-style-type: none"> • 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 • Detail 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 • Explain the significance of maintaining hygiene and confidence during an interview • List the steps for searching and registering for apprenticeship opportunities 	<p>safely and securely</p> <ul style="list-style-type: none"> • Operate digital devices and use the associated applications and features, safely and securely • Create sample word documents, excel sheets and presentations using basic features • Utilize virtual collaboration tools to work effectively • Devise a sample business plan, for the selected business opportunity • Create a professional Curriculum Vitae (CV) • Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively • Perform a mock interview
<p>Classroom Aids:</p>	
<p>PPT, Laptop, White Board, Marker, Projector & Screen, Audio-visual, Chart paper, telephone connection, landline phone, and other required stationery.</p>	
<p>Tools, Equipment and Other Requirements</p>	
<p>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), Scanner cum Printer</p>	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Graduate	Mechanical Engineering	4		2		Practical skills and knowledge required in the relevant field
Post Graduate	Mechanical Engineering	3		1		Practical skills and knowledge required in the relevant field

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Advanced Mechatronics Engineer” mapped to QP: “CSC/Q0414, v1.0”. Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: “Trainer(VET and skills)”, mapped to the Qualification Pack: “MEP/Q2601 V3.0”. Minimum accepted as per respective SSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
Post Graduate	Mechanical Engineering	5		2		Practical skills and knowledge required in the relevant field
Post Graduate	Mechanical Engineering	4		2		Practical skills and knowledge required in the relevant field

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: “ Advanced Mechatronics Engineer ” mapped to QP: “CSC/Q0414, v1.0”. Minimum accepted score is 80%	Certified for the Job Role: “Assessor(VET and skills)”, mapped to the Qualification Pack: “MEP/Q2701, v3.0”, with a 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
- The assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process & records

2. Testing Environment

To ensure a conducive environment for conducting a test, the trainer will:

- 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 10 a.m. and 5 p.m. respectively
- Ensure there are 2 Assessors if the batch size is more than 30.
- 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 levels 1 to 3 are for the unskilled & semi-skilled individuals, and levels 4 and above are for the skilled, supervisor & higher management
- The assessor must be ToA certified and the trainer must be ToT Certified
- The 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:

To verify the details submitted by the training centre, the assessor will undertake:

- A surprise visit to the assessment location
- A random audit of the batch
- A random audit of any candidate

6. Method for assessment documentation, archiving, and access

To protect the assessment papers and information, the assessor will ensure:

- 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 on the Hard drive

References

Glossary

Term	Description
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	The 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
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	The 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
NOS	National Skills Qualification Committee
NSQF	National Skills Qualification Framework
OJT	On-the-Job Training
OMR	Optical Mark Recognition
PC	Performance Criteria
PwD	Persons with Disabilities
QP	Qualification Pack
SDMS	Skill Development & Management System
SIP	Skill India Portal
SSC	Sector Skill Council
TC	Trainer Certificate
ToA	Training of Assessors
ToT	Training of Trainers
TP	Training Provider