

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

### CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

#### Name and address of submitting body:

Electronics Sector Skills Council of India (ESSCI),  
Head Office: 155, 2nd Floor, ESC House  
Okhla Industrial Area-Phase 3, New Delhi -110020  
Tel: +91-8447738501

NCVET Code

2022/EHW/ESSC/05391

#### Name and contact details of individual dealing with the submission

**Name:** Dr. Abhilasha Gaur

**Position in the organisation:** COO

**Address if different from above:** Same as above

**Tel number(s):**

**E-mail address:** ceo@essc-india.org

#### List of documents submitted in support of the Qualifications File

1. Model Curriculum

#### Model Curriculum to be added which will include the following:

- Indicative list of tools/equipment to conduct the training
- Trainers qualification
- Lesson Plan
- Distribution of training duration into theory/practical/OJT component

## SUMMARY

1	<b>Qualification Title:</b> Mechatronics Maintenance Specialist
2	<b>Qualification Code, if any:</b> ELE/Q7105
3	<b>NCO code and occupation:</b> NCO-2015/NA, Engineering I&A
4	<b>Nature and purpose of the qualification (Please specify whether qualification is short term or long term):</b> Responsible for installing, testing, and using sensors, actuators, and microcontrollers in the mechatronics system.
5	<b>Body/bodies which will award the qualification:</b> Electronics Sector Skills Council of India
6	<b>Body which will accredit providers to offer courses leading to the qualification:</b> Electronics Sector Skills Council of India
7	<b>Whether accreditation/affiliation norms are already in place or not, if applicable (if yes, attach a copy):</b> Yes
8	<b>Occupation(s) to which the qualification gives access:</b> Engineering I&A
9	<b>Job description of the occupation:</b> A Mechatronics Maintenance Specialist is responsible for installing, testing, and using sensors, actuators, and microcontrollers in the mechatronics system. The individual is also responsible for carrying out the repair and maintenance of the mechatronics system.
10	<b>Licensing requirements:</b> N/A
11	<b>Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided):</b> N/A
12	<b>Level of the qualification in the NSQF:</b> Level 5
13	<b>Anticipated volume of training/learning required to complete the qualification:</b> 720 hours (Theory: 220, Practical: 300, OJT: 200)
14	<b>Indicative list of training tools required to deliver this qualification:</b> Align, Fit and Assemble Component Parts Using Hand Tools, Power Tools, Fixtures, Templates and Microscopes, Electromechanical Assemblies, Test Instruments Such as Oscilloscopes, Electronic Voltmeters and Bridges, Common Hand and Power Tools, Such as Hammers, Hoists, Saws, Drills and Wrenches, to Precision Measuring Instruments and Electrical and Electronic Testing Device, Sample Of Escalation Matrix, Organization Structure, Personal Protection Equipment: Safety Glasses, Head Protection, Rubber Gloves, Safety Footwear, Warning Signs and Tapes, Fire Extinguisher, First Aid Kit, Fire Extinguishers and Warning Signs.
15	<b>Entry requirements and/or recommendations and minimum age:</b>

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

	<p>3 Years Diploma after 10th (Electrical or Electronics or Mechanical Engineering) with 3 Years of Relevant experience</p> <p>OR</p> <p>3 Years Diploma after 12th (Electrical or Electronics or Mechanical Engineering) with 1 Year of Relevant experience</p> <p>OR</p> <p>B.E./ B. Tech (Degree in Electrical or Electronics or Mechanical Engineering)</p> <p>OR</p> <p>Certificate of NSQF Level-4 in Site Engineer Control Panel with 2 years of relevant Experience</p> <p>21 Years</p>				
<b>16</b>	<b>Progression from the qualification (Please show Professional and academic progression):</b> Mechatronics Designer System Integrator				
<b>17</b>	<b>Arrangements for the Recognition of Prior learning (RPL):</b> RPL will be based on the same approved Qualification Pack and Assessment Criteria mentioned in the Qualification Pack by Electronics Sector Skills Council of India (ESSCI)				
<b>18</b>	<b>International comparability where known (research evidence to be provided):</b> Yet to establish				
<b>19</b>	<b>Date of planned review of the qualification:</b> 02 June 2025				
<b>20</b>	<b>Formal structure of the qualification</b>				
	<b>Mandatory components</b>				
	<b>Title of component and identification code/NOSs/Learning outcomes</b>	<b>Estimated size (learning hours)</b>			<b>Level</b>
		<b>Theory</b>	<b>Practical</b>	<b>OJT</b>	
<b>(i)</b>	Bridge Module	4		0	
<b>(ii)</b>	ELE/N7109: Set up circuits and electrical components in the mechatronics system	60	84	66	5
<b>(iii)</b>	ELE/N7110: Install, test and use the sensors and actuators in the mechatronics system	60	84	66	5
<b>(iv)</b>	ELE/N7111: Install, test and use microcontroller in the mechatronics system	64	84	68	5

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

(v)	ELE/N9905: Work effectively at the workplace	16	24	0	4
(vi)	ELE/N1002: Apply health and safety practices at the workplace	16	24	0	4
	<b>Total</b>	220	300	200	

**SECTION 1**  
**ASSESSMENT**

21	<p><b>Body/Bodies which will carry out assessment:</b> Electronics Sector Skills Council of India</p>
22	<p><b>How will RPL assessment be managed and who will carry it out?</b> Give details of how RPL assessment for the qualification will be carried out and quality assured.</p> <p>The RPL assessment will be carried out through pre assessment, identifying the skills gaps, provide bridge training to cover the competency gap and then conduct final assessment of the candidates.</p>
23	<p><b>Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.</b></p> <p>Assessment is done through third parties who are affiliated to ESSCI as Assessment Body. Assessors are trained &amp; certified by ESSCI through Training of Assessors program. The assessment involves two processes. The first process is gathering the evidence of the competency of individuals. The second part of the assessment process is the judgement as to whether a person is competent or not. The assessment plan contains the following information:</p> <ul style="list-style-type: none"> <li>• What will be assessed, i.e. the competency based on each NOS</li> <li>• How assessment will occur i.e. methods of assessment</li> <li>• When the assessment will occur</li> <li>• Where the assessment will take place i.e. context of the assessment (workplace/simulation)</li> <li>• The criteria for decision making i.e. those aspects that will guide judgements and</li> </ul> <p>Where appropriate, any supplementary criteria used to make a judgement on the level of performance.</p> <p>The assessment is conducted through theory, viva voce and practical.</p>

Please attach most relevant and recent documents giving further information about assessment and/or RPL.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

### ASSESSMENT EVIDENCE

**Complete a grid for each component as listed in “Formal structure of the qualification” in the Summary.**

*NOTE: this grid can be replaced by any part of the qualification documentation which shows the same information – i.e. Learning Outcomes to be assessed, assessment criteria and the means of assessment.*

**24. Assessment evidences**

**Title of Component:** Mechatronics Maintenance Specialist

**CRITERIA FOR ASSESSMENT OF TRAINEES**

**Job Role** Mechatronics Maintenance Specialist

**Qualification Pack** ELE/Q7105

**Sector Skill Council** Electronics Sector Skills Council of India

**Guidelines for Assessment**

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion.
6. To pass the Qualification Pack, every trainee should score a minimum of 70% of aggregate marks to successfully clear the assessment.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

<b>ELE/N7109: Set up circuits and electrical components in the mechatronics system</b>					
<b>PC</b>	<b>Assessment Criteria for Outcomes</b>	<b>Theory Marks</b>	<b>Practical Marks</b>	<b>Project Marks</b>	<b>Viva Marks</b>
<i>Set up microcontrollers</i>		<b>15</b>	<b>35</b>		<b>7</b>
<b>PC1.</b>	select an appropriate mechatronics system to solve the given industrial problem(s) and improve productivity	-	-	-	-
<b>PC2.</b>	select the appropriate mechatronics components for the installation of the mechatronics system	-	-	-	-
<b>PC3.</b>	test the mechatronics components to ensure they are functioning correctly	-	-	-	-
<b>PC4.</b>	install the mechatronics control system	-	-	-	-

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

PC5.	program the microprocessor and microcontroller	-	-	-	-
PC6.	install the hardware interfacing units of microcontrollers	-	-	-	-
PC7.	test the microcontrollers for the correct functioning and carry out troubleshooting for any issues identified	-	-	-	-
	<i>Set up circuits, electrical components and pneumatic system</i>	<b>15</b>	<b>20</b>		<b>8</b>
PC8.	select the appropriate power converter circuits and electrical drives for installation				
PC9.	test the electrical components and circuits for correct functioning and compatibility with the mechatronics system	-	-	-	-
PC10.	select the appropriate pneumatic values according to the need	-	-	-	-
PC11.	perform sequence control and use the logic functions for operating the pneumatic system	-	-	-	-
PC12.	use relays in the pneumatic system	-	-	-	-
PC13.	monitor the pneumatic fluid by analysing the speed and pressure control sensors	-	-	-	-
PC14.	carry out troubleshooting for any issues encountered with the pneumatic system	-	-	-	-
PC15.	design the cascade circuits	-	-	-	-
PC16.	use the appropriate techniques for programming PLC with the help of Ladder diagram	-	-	-	-
PC17.	install the pneumatic power system	-	-	-	-
PC18.	follow the relevant case studies for implementing the pneumatic system in the automatic production line	-	-	-	-
PC19.	carry out maintenance of the circuits, electrical components and pneumatic system	-	-	-	-
<b>NOS Total</b>		<b>30</b>	<b>55</b>		<b>15</b>
<b>ELE/N7110: Install, test and use the sensors and actuators in the mechatronics system</b>					
	<i>Install, test and use sensors</i>	<b>15</b>	<b>30</b>		<b>8</b>
PC1.	select the appropriate contact or contactless sensors for installation as appropriate	-	-	-	-
PC2.	install the selected sensors such as potentiometer sensor following the standard procedure	-	-	-	-
PC3.	test the sensors for correct functioning after installation	-	-	-	-
PC4.	check the working of the strain gauge sensor and measure the torque applied by the motor	-	-	-	-



## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

PC5.	determine the measurement of position and displacement using the eddy current sensor	-	-	-	-
PC6.	use the capacitive element by replacing the mechanical buttons	-	-	-	-
PC7.	use the inductive sensor to measure high precision measurements of displacement, distance, oscillation in harsh industrial environments	-	-	-	-
PC8.	check the position of the piston in the cylinder by using the pneumatic sensor	-	-	-	-
PC9.	detect weak infrared irradiation caused by temperature fluctuation by using a pyro-electric sensor	-	-	-	-
PC10.	measure the electrical potential caused by applying mechanical force to a piezoelectric material by using a piezoelectric sensor	-	-	-	-
PC11.	carry out repair and maintenance of sensors	-	-	-	-
	<i>Install, test and use actuators</i>	<b>15</b>	<b>25</b>		<b>7</b>
PC12.	select the appropriate analogue or digital actuators to install in electrical and hydraulic systems to control various physical quantities	-	-	-	-
PC13.	install an actuator with the appropriate properties according to the need	-	-	-	-
PC14.	use the appropriate interface circuitry to match the actuator to the system driving it	-	-	-	-
PC15.	test the actuator for correct functioning after installation	-	-	-	-
PC16.	carry out troubleshooting for any issues identified with the installed hydraulic and pneumatic actuator as per the sketches and block diagrams	-	-	-	-
PC17.	debounce the keypads to use the mechanical switches as required	-	-	-	-
PC18.	install and use the vane motor as per the standard procedure	-	-	-	-
PC19.	control high-powered circuit using a lower power signal through electro-mechanical and solid- state relays	-	-	-	-
PC20.	use the stepper motor to convert electrical power into mechanical power	-	-	-	-
PC21.	create analytical design and development solutions for actuators for different applications	-	-	-	-
PC22.	carry out repair and maintenance of actuators	-	-	-	-
	<b>NOS Total</b>	<b>30</b>	<b>55</b>		<b>15</b>
<b>ELE/N7111: Install, test and use microcontroller in the mechatronics system</b>					

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

	<i>Install, test and use microcontroller</i>	<b>30</b>	<b>55</b>		<b>15</b>
<b>PC1.</b>	select an appropriate microcontroller to install according to the intended application in the mechatronics system	-	-	-	-
<b>PC2.</b>	install the microcontroller as per the standard procedure and link the function of microcontroller structure in hardware interfacing units of the mechatronics system	-	-	-	-
<b>PC3.</b>	test the microcontroller after installation to ensure it functions as expected	-	-	-	-
<b>PC4.</b>	program the microcontroller to execute a specific set of instructions	-	-	-	-
<b>PC5.</b>	test the functioning of the machine using the mechatronics system	-	-	-	-
<b>PC6.</b>	carry out interfacing of Analog-To-Digital (A/D) and Digital-To-Analog (D/A) convertors using the appropriate type of microcontroller	-	-	-	-
<b>PC7.</b>	compose and program stepper motor using the appropriate type of microcontroller	-	-	-	-
<b>PC8.</b>	compose and program Advanced RISC Machine (ARM) and microprocessor with stepper motor	-	-	-	-
<b>PC9.</b>	carry out repair and maintenance of microcontrollers	-	-	-	-
	<b>NOS Total</b>	<b>30</b>	<b>55</b>		<b>15</b>
<b>ELE/N9905: Work effectively at the workplace</b>					
	<i>Communicate effectively at the workplace</i>	<b>5</b>	<b>13</b>		
<b>PC1.</b>	exchange information and instruction with colleagues, and seek clarifications and feedback as necessary	1	3	-	-
<b>PC2.</b>	assist colleagues where required	1	3	-	-
<b>PC3.</b>	follow business communication etiquette in all interactions and communicative formats (online, digital, and in-person)	1	4	-	-
<b>PC4.</b>	document and share all relevant information with stakeholders in agreed formats and as per agreed timelines	2	3	-	-
	<i>Work effectively</i>	<b>6</b>	<b>13</b>	-	-
<b>PC5.</b>	identify and obtain clarity regarding organisational, team and own goals and targets	1	2	-	-
<b>PC6.</b>	prioritise and plan work in order to achieve goals and targets	1	2	-	-

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

PC7.	monitor own and team performance as per agreed plan	1	2	-	-
PC8.	complete duties accurately, systematically and within required timeframes	1	2	-	-
PC9.	express emotions appropriately at the workplace and manage own response to heightened emotions	1	2	-	-
PC10.	maintain orderliness and cleanliness in the work area	1	3	-	-
	<b>Maintain and enhance professional competence</b>	<b>8</b>	<b>7</b>	-	-
PC11.	identify own strengths and weaknesses in relation to goals and targets	1	1	-	-
PC12.	adapt self, service, or product to meet success criteria	1	1	-	-
PC13.	seek and select opportunities for continuous professional development	1	1	-	-
PC14.	formulate a professional development plan to enhance capabilities	2	1	-	-
PC15.	build or contribute to the organizational knowledge base of cases, clients, issues, solutions, and innovations	1	1	-	-
PC16.	examine developments and trends in field of work and their potential impact on work	1	1	-	-
PC17.	take feedback from peers, supervisors and clients to improve own performance and practices	1	1	-	-
	<b>Work in a disciplined and ethical manner</b>	<b>11</b>	<b>16</b>	-	-
PC18.	perform tasks as per workplace standards, organisational policies and legislative requirements	2	2	-	-
PC19.	display appropriate professional appearance at the workplace and adhere to the organisational dress code	1	2	-	-
PC20.	demonstrate responsible and disciplined behaviour at the workplace such as punctuality; completing tasks as per given time and standards; demonstrating professional behaviour at all times, adopting environment- friendly practices, etc.	1	2	-	-
PC21.	identify the cause of conflict and options for resolution with peers or escalate grievances and problems to appropriate authority as per procedure for conflict resolution	2	2	-	-
PC22.	protect the rights of the client and organisation when delivering services	1	2	-	-
PC23.	ensure services are delivered equally to all clients regardless of personal and cultural beliefs	1	2	-	-

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

PC24.	operate within an agreed ethical code of practice and report unethical conduct to the appropriate authorities	2	2	-	-
PC25.	follow organisational guidelines and legal requirements on disclosure and confidentiality	1	2	-	-
	<b><i>Uphold social diversity at the workplace</i></b>	<b>10</b>	<b>11</b>	-	-
PC26.	recognize and evaluate biased practices against underrepresented groups like women and persons with disabilities, in workplace systems and processes	2	2	-	-
PC27.	identify and report discrimination and harassment based on gender, disability, or cultural difference at the workplace	2	2	-	-
PC28.	use inclusive or neutral language and gestures in all interactions	2	2	-	-
PC29.	respect the personal and professional space of others	2	2	-	-
PC30.	access grievance redressal mechanisms as per legislations	2	3	-	-
	<b>NOS Total</b>	<b>40</b>	<b>60</b>		
	<b>ELE/N1002: Apply health and safety practices at the workplace</b>				
	<b><i>Deal with workplace hazards</i></b>	<b>20</b>	<b>31</b>	-	-
PC1.	identify job-site hazards and possible causes of accident in the workplace	2	3	-	-
PC2.	perform work complying to organizational safe working practices and observing hazard signs displayed on containers, equipment and in various work areas such as inside buildings, in open areas and public spaces, etc.	3	4	-	-
PC3.	use appropriate personal protective equipment (PPE) for specific tasks and work conditions, contaminant (concentration w.r.t air) requirements and severity of hazard while conforming to the Indian/International standards	3	4	-	-
PC4.	follow standard safety procedures while handling tool/ ,equipment, hazardous substances and while working in hazardous environments	3	4	-	-
PC5.	dispose electronic waste (such as toxins; metals such as lead, cadmium, barium; flame retardant plastics, welding slag etc.) as per industry approved techniques	2	4	-	-

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

PC6.	avoid damage of components due to negligence in electrostatic discharge (ESD) procedures	2	3	-	-
PC7.	locate general health and safety equipment in the workplace such as fire extinguishers; first aid equipment; safety instruments, clothing and installations (fire exits, exhaust fans)	2	3	-	-
PC8.	maintain appropriate posture while handling heavy objects	1	3	-	-
PC9.	apply good housekeeping practices at all times	2	3	-	-
	<i>Apply fire safety practices</i>	<b>4</b>	<b>9</b>	-	-
PC10.	take preventive measures to prevent fire hazards	2	3	-	-
PC11.	use appropriate fire extinguishers for different types of fires, Types of fires: Class A: e.g. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class C: e.g. electrical equipment such as appliances, wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no I	1	3	-	-
PC12.	exhibit rescue and first-aid techniques in case of fire or electrocution	1	3	-	-
	<i>Follow emergencies, rescue and first-aid procedures</i>	<b>6</b>	<b>13</b>	-	-
PC13.	administer appropriate first aid to victims in case of bleeding, burns, choking, electric shock, poisoning etc.	1	3	-	-
PC14.	administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock,	1	2	-	-
PC15.	participate regularly in emergency procedures such as raising alarm, safe/efficient, evacuation, correct means of taking shelter and escaping, correct assembly point, roll call, correct return to work	2	4	-	-
PC16.	use correct method to move injured people and others during an emergency	2	4	-	-
	<i>Effective waste management/recycling practices</i>	<b>5</b>	<b>12</b>	-	-
PC17.	identify recyclable and non-recyclable, and hazardous waste generated	1	3	-	-
PC18.	segregate waste into different categories	1	2	-	-
PC19.	ensure disposal of non-recyclable waste appropriately	1	2	-	-

**NSQF QUALIFICATION FILE****Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022**

<b>PC20.</b>	deposit non-recyclable and reusable material at identified location	1	3	-	-
<b>PC21.</b>	follow processes specified for disposal of hazardous waste	1	2	-	-
	<b>NOS Total</b>	<b>35</b>	<b>65</b>		

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

<b>Outcomes to be assessed/NOSs to be assessed</b>	<b>Assessment criteria for the outcome</b>
Provided in the above section	
<b>Means of assessment 1</b> <ol style="list-style-type: none"><li>1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.</li><li>2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.</li><li>3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below.)</li><li>4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on these criteria.</li></ol>	
<b>Means of assessment 2</b> <p>Add boxes as required.</p>	
<b>Pass/Fail</b> <ol style="list-style-type: none"><li>1. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS.</li><li>2. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.</li></ol>	

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

### SECTION 2

#### 25 EVIDENCE OF LEVEL

Title/Name of qualification/component: Mechatronics Maintenance Specialist			Level: 5
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
Process	<p><b>Demands a wide range of specialised technical skill, clarity of knowledge and practice in broad range of activity involving standard and non-standard practices.</b></p> <ul style="list-style-type: none"> <li>Set up circuits, electrical components and pneumatic system</li> </ul>	<p>A Mechatronics Maintenance Specialist is responsible for installing, testing, and using sensors, actuators, and microcontrollers in the mechatronics system.</p>	5
Professional knowledge	<p><b>Basic knowledge of electronics involved in hardware, how to operate the system and other hardware peripherals</b></p> <ul style="list-style-type: none"> <li>Set up microcontrollers</li> <li>Effective waste management/recycling practices</li> <li>Communicate effectively at the workplace</li> </ul>	<p>A Mechatronics Maintenance Specialist should know to select an appropriate mechatronics system to solve the given industrial problems, install the mechatronics control system, install the hardware interfacing units of microcontrollers.</p> <p>Hence Level 5</p>	5
Professional skill	<p><b>A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study.</b></p>	<p>A Mechatronics Maintenance Specialist should be able to carry out troubleshooting for any issues identified with the installed hydraulic and pneumatic actuator as per the sketches and block diagrams</p>	5



## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

Title/Name of qualification/component: Mechatronics Maintenance Specialist			Level: 5
NSQF Domain	Key requirements of the job role	How the job role relates to the NSQF level descriptors	NSQF Level
	<ul style="list-style-type: none"> <li>Install, test and use actuators</li> </ul>	Hence Level 5	
Core skill	Reasonably good in installing and configuring peripherals. <ul style="list-style-type: none"> <li>Install, test and use sensors</li> </ul>	A Mechatronics Maintenance Specialist must have the knowledge to install the selected sensors such as potentiometer sensor following the standard procedure, use the inductive sensor to measure high precision measurements of displacement, distance, oscillation in harsh industrial environments  Hence Level 5	5
Responsibility	Responsibility of completing the work assigned and reporting the same as per standards. <ul style="list-style-type: none"> <li>Install, test and use microcontroller</li> <li>Maintain and enhance professional competence</li> </ul>	A Mechatronics Maintenance Specialist is responsible for installing, testing, and using sensors, actuators, and microcontrollers in the mechatronics system.  Hence Level 5	5

**SECTION 3**

**EVIDENCE OF NEED**

<b>26</b>	<b>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</b>		
	<b>Basis</b>	<b>In case of SSC</b>	<b>In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</b>
	<p>The electronic devices industry valued at \$118 bn in 2019-20 is segmented as Mobile Phones (24%), Consumer Electronics (22%), Strategic Electronics (12%), Computer Hardware (7%), LEDs (2%) and Industrial Electronics (34%) comprising of Auto, Medical and other industrial electronic products.</p> <p>The Indian electronics manufacturing industry is projected to reach US\$ 520 billion by 2025. In August 2021, exports of electronic goods stood at US\$ 1.14 billion.</p>	<p>The SSC would undertake market study and would enclosed demand forecast for the proposed job role both on short-term and long-term basis to substantiate the requirement of the Qualification proposed. The SSC can produce the data from primary or authorized secondary sources as well.</p>	<p>The Submitting Body would produce any reputable and reliable research reports, such as labour market information reports; occupational mapping or similar research carried out by Ministry/State/Any other authentic source forecasting the demand for the proposed qualification</p>

## NSQF QUALIFICATION FILE

Approved in 16<sup>th</sup> NSQC Meeting-NCVET-Dated 24th February, 2022

<p>Industry Relevance We are in the process of taking industry validation.</p>	<p>The SSC would undertake validation of the job roles with actual end-user industry where such employment are going to be generated and absorbed instead of generic validation of industry. The SSC would submit the endorsements from users/intended users of the qualification clearly supporting or otherwise the need for trained people against specific job role.<i>(The industry validation format to be used)</i></p>	<p>The Submitting Body would submit the list of industry participation while preparation of the curriculum/ course content of the qualifications. These could include minutes of the meeting/ reports of these consultations</p>
<p>Usage of the qualification: This Qualification Pack will be used across Industrial Automation industry which is organised as well as unorganised</p>	<p>The SSC would submit details of the employment generated (wherever applicable) and realised by virtue of training in the Qualifications of the sector earlier submitted for NSQF alignment.</p> <p>In case of unorganized sector, case studies or evidences may be given</p>	<p>The submitting body would submit the details of trained and placed data in the proposed qualification (if an existing qualification is being proposed for NSQF alignment)</p> <p>Information about the success of the qualification should be given (e.g. uptake figures, examples of use in recruitment and placement rates (if known) should be given. However, many of the bodies that do not have placement tracking mechanism established in place would provide necessary endorsements by the state/ ministry stating that a tracking</p>

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			mechanism would be institutionalized and placement records shall be provided annually or later, depending on length of qualification.
	<p>Estimated uptake</p> <p>In order to position India as a global hub for Electronics System Design and Manufacturing (ESDM) It is estimated that approx.84,000 additional jobs will be created during the period of FY'19 to FY'24, growing 11-12% CAGR</p>	<p>The SSC would submit the estimated uptake of the qualification and What steps were carried out to test the likely uptake of the qualification? The basis of this estimate should include data about the number of jobs or places in courses of learning which will be available to people who are awarded the qualification.</p>	<p>The Submitting Body should submit the estimated uptake by reflecting the number of the takers for this qualification for at least two years from submission of the qualification</p>
27	<p><b>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences</b></p> <p>Ministry of Electronics and Information Technology, Government of India (MeitY)</p>		
28	<p><b>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</b></p> <p>This is the first time that this Qualification is being made. The national qualification register as well as the Qualification Packs with NSDC have been checked.</p>		
29	<p><b>What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated? Specify the review process here</b></p>		

## NSQF QUALIFICATION FILE

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	<p>Any institution or individual is welcome to send the feedback, which is recorded and considered during next review cycle.</p> <p>Communication will be sent for any feedback to all the main stakeholders/users one month prior to the review of the qualifications pack.</p> <p>A formal review is scheduled in three year.</p>
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**SECTION 4**

**EVIDENCE OF PROGRESSION**

30

**What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?**

**Show the career map here to reflect the clear progression**

1. Discussing the growth trajectory within each occupation after studying organisational charts of various industry players across small, medium and large scale organizations.
2. Exploring various lateral career opportunities for the discussed qualification
3. Ensuring that there is a clear role up in terms of performance criteria qualification experience and skill requirement from lower NSQF Level to higher levels in the hierarchy.

**Annexure 1: Career Map of Mechatronics Maintenance Specialist**

