QUALIFICATION FILE – Standalone NOS

Fundamentals of Calibration and Quality Concepts of Metrological Instruments

☒ Horizontal/Generic ☐ Vertical/Specialization

☒ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA

☒General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☐ Future Skills

NCrF/NSQF Level: 4.5

Submitted By:

Additional Skill Acquisition Programme

KINFRA Film and Video park, Sainik School P.O, Kazhakkoottam

Thiruvananthapuram, Kerala, India-695585

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Basic Details

1.	**NOS-Qualification Name**	**Fundamentals of Calibration and Quality concepts of Metrological Instruments**	
2.	**Sector/s**	Capital goods and Manufacturing	
3.	**Type of Qualification** ☒ **New** ☐ **Revised**	**NQR Code & version of the existing /previous qualification:** *(change to previous, once approved)NA*	**Qualification Name of the existing/previous version:** *(previous, once approved)* **NA**
4.	**National Qualification Register (NQR) Code & Version** *(Will be issued after NSQC approval.)*	**QG-4.5-CG-03270-2024-V1-ASAP**	***5.*** **NCrF/NSQF Level:** 4.5
6.	**Brief Description of the Standalone NOS**	The course covers a comprehensive range of topics related to metrology, calibration, inspection, quality control/assurance, and non-conformance management in industrial settings. It begins with an introduction to the fundamental concepts of metrology, including accuracy, precision, traceability, and measurement units. Students are then familiarized with various general metrology instruments and their applications. Moving forward, the course delves into calibration techniques for a variety of instruments and calibrators, including electrical measuring instruments, thermal measuring instruments, pressure/vacuum gauges, weighing balances and standard weights, volumetric measuring glassware, and dimensional artifacts. Students learn how to accurately calculate uncertainties in measurements and prepare detailed calibration reports. Furthermore, the curriculum addresses non-conformance management, corrective and preventive actions (CAPA), control chart analysis, sampling inspection techniques, statistical quality control, and failure mode and effects analysis (FMEA). Students are provided with case studies to analyze and interpret, allowing them to apply their knowledge and problem-solving skills to real-world scenarios.	

<table>
<tr><td></td><td></td><td colspan="2">Overall, the course aims to equip students with a comprehensive understanding of metrology and calibration principles, practical skills in instrument calibration, and the ability to manage quality control/assurance and non-conformances effectively in industrial environments</td></tr>
<tr><td>7.</td><td>Eligibility Criteria for Entry for a Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification & Relevant Experience:
<table>
<tr><th>Sl. No:</th><th>Educational Qualification</th><th>Experience Required</th></tr>
<tr><td>1</td><td>□ Pursuing 1st year of 3-year/ 4 years UG* and continuing education.
□ Pursuing 3rd year of 3-year diploma* after 10th in the relevant field and continuing education.
□ Pursuing 1st year of 2 year diploma* after 12th</td><td>No experience required</td></tr>
<tr><td>2</td><td>□ 12th Grade Pass</td><td>1.5 year relevant experience**</td></tr>
<tr><td>3</td><td>□ Previous NSQF level 4 acheived</td><td>1.5 year relevant experience**</td></tr>
</table>
* Chemistry/physics/material science/ biological science/instrumentation/Mechanical/Production Engineering/Electrical/Electronics
**experience in manufacturing/industrial plants/instrumentation/calibration services</td></tr>
<tr><td>8.</td><td>Credits Assigned to this NOS-Qualification, Subject to Assessment (as per National Credit Framework (NCrF))</td><td>1.5</td><td>9. Common Cost Norm Category (I/II/III) (wherever applicable): II</td></tr>
</table>

<table>
<tr><td>10.</td><td>Any Licensing Requirements for Undertaking Training on This Qualification (wherever applicable)</td><td>NA</td></tr>
<tr><td>11.</td><td>Training Duration by Modes of Training Delivery (Specify Total Duration as per selected training delivery modes and as per requirement of the qualification)</td><td>
<table>
<tr><th>Training Delivery Mode</th><th>Theory (Hours)</th><th>Practical (Hours)</th><th>Total (Hours)</th></tr>
<tr><td>Classroom (offline)</td><td>15</td><td>30</td><td>45</td></tr>
</table>
☒ Offline Only ☐ Online Only ☐ Blended
</td></tr>
<tr><td>12.</td><td>Assessment Criteria</td><td>
<table>
<tr><th>Theory (Marks)</th><th>Practical (Marks)</th><th>Project (Marks)</th><th>Viva (Marks)</th><th>Total (Marks)</th><th>Passing %</th></tr>
<tr><td>40</td><td>50</td><td>NA</td><td>10</td><td>100</td><td>50%</td></tr>
</table>
*Offline Assessment only
</td></tr>
<tr><td>13.</td><td>Is the NOS Amenable to Persons with Disability</td><td>☒ Yes ☐ No If “Yes”, specify applicable type of Disability:</td></tr>
<tr><td>14.</td><td>Progression Path After Attaining the Qualification, wherever applicable (Please show Professional and Academic progression)</td><td>Calibration Technician-Engineer-Inspector-Senior Manager</td></tr>
<tr><td>15.</td><td>How participation of women will be encouraged?</td><td>ASAP Kerala offers courses in a gender-neutral manner, ensuring egalitarian mobilization of students and providing equal opportunity for all.</td></tr>
<tr><td>16.</td><td>Other Indian languages in which the Qualification & Model Curriculum are being submitted</td><td>Hindi (Please provide assurance and plan for developing the qualification in other Indian Languages as per training requirement))</td></tr>
<tr><td>17.</td><td>Is similar NOS available on NQR-if yes, justification for this qualification</td><td>☐ Yes ☒ No URLs of similar Qualifications:</td></tr>
</table>

18.	**Name and Contact Details Submitting / Awarding Body SPOC** *(In case of CS or MS, provide details of both Lead AB & Supporting ABs)*	**Name: Dr. Usha Titus IAS (Retd), CMD ASAPK** **Email: nsqf@asapkerala.gov.in, curriculum@asapkerala.gov.in** **Website: www.asapkerala.gov.in**	
19.	**Final Approval Date by NSQC: 22-10-2024**	**20. Validity Duration: 3 years**	**21. Next Review Date: 21-10-2027**

Training Related

1.	**Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Diploma or Bachelors Degree in Engineering* with at least 2 years of Industry experience. Certified for the Job Role: "Trainer (VET and Skills)", mapped to the Qualification Pack: "MEP/2601, V2.0" with a minimum score of 80%. *Mechanical/Electrical/Production/Automobile/Instrumentation
2.	**Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)*	Diploma or Bachelors Degree in Engineering* with at least 3 years of Industry experience. Certified for the Job Role "Master Trainer (VET and Skills), mapped to the Qualification Pack "MEP/Q2602, V2.0" with minimum score of 80%. *Mechanical/Electrical/Production/Automobile/Instrumentation
3.	**Tools and Equipment Required for the Training**	☒Yes ☐No *(If "Yes", details to be provided in Annexure)*
4.	**In Case of Revised NOS, details of Any Upskilling Required for Trainer**	NA

Assessment Related

1.	**Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	Diploma or Bachelor's Degree in Engineering* with at least 2 years of Industry experience. Certified for the Job Role: "Assessor (VET and Skills)", mapped to the Qualification Pack: "MEP/Q2701, V2.0", with a minimum score of 80%. *Mechanical/Electrical/Production/Automobile/Instrumentation
2.	**Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines), (wherever applicable)*	NA.
3.	**Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)*	NA
4.	**Assessment Mode** *(Specify the assessment mode)*	Offline
5.	**Tools and Equipment Required for Assessment**	☒ Same as for training ☐ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)*

Evidence of the Need for the Standalone NOS

Provide Annexure/Supporting documents name.

1.	Government /Industry initiatives/ requirement (Yes/No): Yes
2.	Number of Industry validation provided: 12
3.	Estimated number of people to be trained: 750
4.	Evidence of Concurrence/Consultation with Line/State Departments (In case of regulated sectors): *Awaiting reply* If "No", why:

Annexures & Supporting Documents Check List

Specify Annexure Name / Supporting document file name

1.	**Annexure:** NCrF/NSQF level justification based on NCrF/NSQF descriptors *(Mandatory)*	Annexure attached
2.	**Annexure:** List of tools and equipment relevant for NOS *(Mandatory, except in case of online course)*	Annexure attached
3.	**Annexure:** Performance and Assessment Criteria *(Mandatory)*	*Annexure attached*
4.	**Annexure:** Assessment Strategy *(Mandatory)*	*Annexure attached*
5.	**Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is Blended Learning)*	*NA*
6.	**Annexure:** Acronym and Glossary *(Optional)*	*Annexure attached*
7.	**Annexure/Supporting Document:** Standalone NOS- Performance Criteria Details Annexure/Document with PC-wise detailing as per NOS format (Mandatory- Public view)	*Annexure attached*
8.	**Supporting Document:** Model Curriculum *(Mandatory – Public view)*	*Annexure attached*

Annexure 1: Evidence of Level

NCrF/NSQF Level Descriptors	Key requirements of the job role/ outcome of the qualification	How the job role/ outcomes relate to the NCrF/NSQF level descriptor	NCrF/NSQF Level
Professional Theoretical Knowledge/Process	Deeper knowledge and understanding of specialized field of technology / skills/ job role and its underlying principles. Acquired specialized knowledge and a range of cognitive and practical skills to accomplish tasks like basic design, prototyping, testing so as to solve a problem by selecting appropriate information, methods, tools, and materials.	Deeper knowledge and understanding of metrology and calibration and its underlying principles. Acquired specialized knowledge and a range of cognitive and practical skills.	4.5
Professional and Technical Skills/ Expertise/ Professional Knowledge	Skill to clearly identify the relevant tools or sometimes improvise the available tools and techniques; and has advance knowledge of materials in difficult situations and different contexts. Possesses a range of professional and technical skills, displays clarity of knowledge and practice in broad range of activities/ tasks.	Knowledge to identify the relevant tools or sometimes improvise the available tools and techniques in the metrology and calibration lab. production facilities and manufacturing hubs. Possesses a range of professional and technical skills, displays clarity of knowledge and practice in broad range of tasks in the production facilities/Labs/Industries/Manufacturing units.	4.5
Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill	Possesses excellent oral and written communication and collaboration skills for clearly taking the vision of the leaders to the shop floor level workforce. Very good in complex calculations, and mathematical and financial analysis skills for applied solutions.	Possesses excellent oral and written communication and collaboration skills for clearly taking the vision of the organization ahead in the shop floor level workforce. Adept at complex calculations and mathematical skills for monitoring and analysing the readings of instruments and machines.	4.5
Broad Learning Outcomes/Core Skill	Demonstrates a wide range of specialized professional and technical skill in broad range of activity involving standard and non-standard practices.	Take decisions based on the analysis and study of information/readings.	4.5

	Apply the acquired specialized knowledge and a range of cognitive and practical skills to accomplish tasks like basic design, prototyping, testing to solve problems by selecting appropriate information, methods, tools, and materials. Communication and collaboration skills to act as a layer between the senior management and workforce/ shop floor. Make judgement and take decision, based on the analysis and evaluation of information, for determining solutions to a variety of unpredictable problems associated with the chosen fields of learning,	Apply the acquired specialized knowledge and a range of cognitive and practical skills to accomplish tasks. Communication and collaboration skills to act as a layer between the senior management and technicians. Demonstrates technical skill in broad range of activity involving standard and non-standard practices	
Responsibility	Technical supervisor or junior/ deputy manager. Manages processes and procedures within broad parameters for defined activities. Supervises the routine work of others, takes the required responsibility for the evaluation and improvement of work or study activities	Technical supervisor. Manage the processes and procedures within the defined parameters in the Lab/Industry/Manufacturing unit. Supervise the routine work of others.	4.5

Annexure 2: Tools and Equipment (lab set-up)

Sl. No.	Tools/ Equipment Name	Specification	Quantity for specified Batch size
1	Multi-Function Calibrator	Source AC/DC Voltage (1mV to 1000V), AC/DC Current (100µA to 20A), Resistance (1mOhm to 330MOhm), Capacitance 1nF to 1 mF), Frequency (1Hz to 330MHz), Temperature Simulation – RTD & Thermocouple	2
2	Decade Resistance/Capacitance/ Inductance Boxes	Source Resistance (1mOhm to 10GOhm), Capacitance (10pF to 100µF), Inductance (1mH to 10H)	2

3	Reference Multimeter	Measure AC/DC Voltage (1mV to 1000V), AC/DC Current (100µA to 20A), Resistance (1mOhm to 10GOhm)	2
4	LCR Meter	Measure Capacitance (10pF to 100µF), Inductance (100µH to 10H), AC Resistance (1Ohm to 1MHOhm)	2
5	Frequency Counter	Measure Frequency (1Hz to 1GHz), Period, Time Totalising, Time Interval, etc	2
6	Arbitrary Waveform Generator	Source: Sine, Square, Pulse, Triangular & Arbitrary waveforms up to 20MHz	2
7	AC/DC Power Meter	Measure AC/DC Power up to 20kW	2
8	Standard Platinum Resistance Thermometer (SPRT)	Measure Temperature (-196 to 660°C)	2
9	Standard S Type Thermocouple with Cold Junction	Measure Temperature (100 to 1200°C)	2
10	Digital Temperature Readout	Indicate temperature measured by SPRT, PRT, RTD, Thermocouple of all type	2
11	Temperature Baths	Source Temperature (-80°C to 200°C)	2
12	Dry Block Furnaces	Source Temperature (50°C to 1200°C)	2
13	Humidity Chamber	Relative Humidity (30 to 90%RH), Temperature (10 to 50°C)	2
14	Standard Weights (E1, F1 Classes)	1mg to 20kg	2
15	Micro Balance, Precision Balance, Mass Comparators	1mg to 40kg	2
16	Gauge Block Set	1mm to 1000mm	2
17	Scale & Tape Calibration Unit	With 1mm least count	2
18	Electronic Dial Calibration Setup	Dial Gauges : 1mm to 25mm	2
19	Oil Dead Weight Tester	1 to 1200kg/cm^2	2
20	Digital Hydraulic Pressure Calibrator	0 to 400kg/cm^2)	2
21	Pneumatic Pressure Calibrator	-1 to 20bar	2
22	Digital Non-Contact Tachometer	25000rpm	2

Classroom Aids

The aids required to conduct sessions in the classroom are:

1. Whiteboard
2. Projector
3. Computer/Laptop
4. Chairs
5. Tables
6. Whiteboard marker

Annexure 3: Industry Validations Summary

Sl. No	Organization Name	Representative Name	Designation	Contact Address	Contact Phone No	E-mail ID
1	Sophisticated Test and Instrumentation Centre ,India	Dr. M. Gopalakrishna Pillai	Director	Sophisticated Test & Instrumentation Centre (STIC) Cochin University of Science and Technology, CUSAT Campus, Cochin - 682022, Kerala, India	9446118777	director@sticindia.com
2	Paramount Hydro-Pneumatic Systems.	Hareendranath T. G.	Partner	Door No. Xxxiii/594, Development Plot, Kalamassery, Kochi, Kerala-683104	9446320447	paramounthydro@gmail.com
3	Industrial Connectors	Narendranath T G	Proprietor	Plot No 94a, Developmnent Plot Kalamassery, Kochi, Kerala-683104,Indconengineers@Yahoo.In ,91 484 2966040	9447054044, 6282822019	indcoengineers@yahoo.in

4	Aluminium Industries Limited – Relays Division	Bharath Chandran J	Assistant Manager	Kavinpuram, Vilappilsala P. O, Thiruvananthapuram, Kerala, India 695573 Website: Www.Alindrelays.Com	+91 9446005703	bharath@alindrelays.com
5	Kay Kay Plastic Industries	Nishad P. U.	QA Manager	28 Kallang Place, Singapore	NA	nishekm@gmail.com
6	Camaero Manufacturing And Sensors Technology Private Limited	Najeeb Khan N	Managing Director	Plot No. A 35(B) Kinfra International Apparel Park, Thumba, Menamkulam Thiruvananthapuram-695586, Kerala Https://Camaerotechnology.Com/	7356459569	email@camaerotechnology.com
7	Nutri Leaves	A. K. Abdulla	Managing Director	Abdullarpn@Gmail.Com	9048505577	abdullarpn@gmail.com
8	Indian Council of Agriculture Research (ICAR)- Central Tuber Crops Research Institute	Dr. T. Makesh Kumar	Head -Division of Crop protection	ICAR CTCRI Sreekaryam Thiruvananthapuram	Ph: +91 471 2598551 to 554 (O)+91 9447158546 (M)	pme.ctcri@icar.gov.in
9.	Kerala Feeds	Dr. Anuraj K. G.	Asst. Manager,QC	Kerala Feeds Ltd. Feeds Nagar, Kallettumkara Kerala, Pin - 680683	9458752094	qc@keralafeeds.com

10.	Kerala Feeds	Krishnan S.	Dy. Manager, Production & Maintenance	Kerala Feeds Ltd. Feeds Nagar, Kallettumkara Kerala, Pin - 680683	9496127500	krishnan_kfl@yahoo.co.in
11.	NATPAC National Transportation Planning and Research Centre	Dr. Salini U.	Scientist	NATPAC, K.Karunakaran Transpark Ulloor - Akkulam Road Aakkulam Thuruvikkal, PO, Thiruvananthapuram, Kerala 695011	9447512651	salini@gmail.com
12.	Forays Services & Construction Pvt. Ltd.	Nithin John	Asst. Manager , Business Development	Forays Services & Construction Pvt. Ltd.,1301, 13th Floor, The Ambience Court, Plot No. 2, Sector – 19D, Vashi, Navi Mumbai,400 705	7907939528	nithinjoh@forays.co.in

Annexure 4: Training Details

Training Projections:

Year	Estimated Training # of Total Candidates	Estimated training # of Women	Estimated training # of People with Disability
2023-24	250	125	NA
2024-25	250	125	NA
2025-26	250	125	NA

Data to be provided year-wise for next 3 years.

Annexure 5: Standalone NOS- Performance Criteria details

1. **Description:** Performance criteria for this course encompass both theoretical understanding and practical application of concepts related to metrology, calibration, inspection, quality control/assurance, and non-conformance management. Performance criteria for this course aim to evaluate students' proficiency in theoretical understanding, practical application, problem-solving, critical thinking, professionalism, collaboration, and continuous improvement in the field of metrology, calibration, inspection, quality control/assurance, and non-conformance management.
2. **Scope:** The scopes of the performance criteria for this course encompass various aspects related to metrology, calibration, inspection, quality control/assurance, and non-conformance management. These performance criteria are designed to evaluate students' competencies and capabilities in the following areas:
    - Theoretical Understanding
    - Practical Application
    - Problem-Solving and Critical Thinking
    - Professionalism and Collaboration
    - Continuous Improvement

3. Elements and Performance Criteria

Theoretical Knowledge Assessment Criteria:

- Ability to explain fundamental concepts of metrology, calibration, and quality assurance.
- Demonstration of understanding of measurement uncertainty principles and calculation methods.
- Explanation of temperature measurement basics and temperature sensor characteristics.
- Understanding of non-conformance management principles, CAPA, control charts, sampling inspection, and statistical quality control.

Practical Skills Assessment Criteria:

- Proficiency in using general metrology instruments for measurements and inspections.
- Accuracy in conducting calibration procedures for various instruments and calibrators.
- Competence in calculating uncertainties in measurements and preparing detailed calibration reports.
- Application of temperature measurement techniques and calibration of temperature sensors.

- Ability to manage non-conformances, implement CAPA measures, and analyze control charts and sampling inspection data.

Overall Performance Evaluation Criteria:

- Mastery of both theoretical knowledge and practical skills in metrology, calibration, and quality assurance.
- Ability to apply learned concepts and methodologies to solve real-world problems in industrial settings.
- Effective communication of findings, analysis, and recommendations related to metrology and quality assurance.
- Continuous improvement and willingness to learn new techniques, methodologies, and technologies in the field.

4. Knowledge and Understanding (KU):

After completing this course, the individual on the job will have acquired the following Knowledge and Understanding (KU):

a) Metrology and Calibration: Fundamental concepts and principles of metrology, including accuracy, precision, traceability, and measurement units. Calibration procedures for various instruments and calibrators, considering measurement uncertainties and adhering to standard protocols.
b) Instrumentation: Familiarity with general metrology instruments and their applications in industrial settings, including electrical measuring instruments, thermal measuring instruments, pressure/vacuum gauges, and dimensional artifacts.
c) Measurement Uncertainty: Understanding of measurement uncertainty principles, calculation methods, and their application in calibration and quality assurance processes.
d) Temperature Measurement: Basics of temperature measurement, temperature sensor characteristics, and their relevance in industrial applications. Calibration techniques for temperature sensors and thermal measuring instruments, ensuring reliability in temperature readings.
e) Quality Control and Assurance: Principles and methods of quality control, including inspection techniques, statistical quality control, control charts, and sampling inspection. Quality assurance practices, including non-conformance management, corrective and preventive actions (CAPA), and compliance with industry standards and regulations.
f) Professionalism and Collaboration: Professionalism, integrity, and ethical behavior in metrology, calibration, and quality assurance practices. Effective collaboration with team members and stakeholders to achieve common goals related to quality improvement and customer satisfaction.
g) Continuous Improvement: Importance of continuous learning and professional development in staying updated with emerging trends, technologies, and best practices in the field. Commitment to lifelong learning and improvement in metrology, calibration, and quality assurance practices to contribute to organizational success.

5. Generic Skills (GS):

After completing this course, the learner will have developed the following generic skills:

- Problem-solving: The ability to identify and analyze problems related to metrology, calibration, and quality assurance, and to develop effective solutions to improve measurement accuracy and quality control processes.
- Critical thinking: The capacity to evaluate information, data, and results critically, and to make informed decisions based on thorough analysis and reasoning in various metrology and quality assurance scenarios.
- Communication: Proficiency in conveying technical information, findings, and recommendations effectively through written reports, presentations, and discussions to diverse stakeholders, including peers, supervisors, and clients.
- Teamwork: The capability to collaborate efficiently with team members and stakeholders, contributing positively to team dynamics, sharing knowledge and expertise, and achieving common goals related to quality improvement and customer satisfaction.
- Attention to detail: The ability to pay close attention to detail during calibration procedures, measurement uncertainty calculations, and documentation preparation to ensure accuracy and reliability in measurement and calibration processes.
- Adaptability: The capacity to adapt to changing environments, technologies, and methodologies in metrology, calibration, and quality assurance practices, and to quickly learn and apply new concepts and techniques as needed.
- Time management: The skill to prioritize tasks effectively, manage workload efficiently, and meet deadlines while maintaining high standards of accuracy and quality in metrology, calibration, and quality assurance activities.
- Continuous learning: The commitment to continuous learning and professional development in metrology, calibration, and quality assurance practices, including staying updated with emerging trends, technologies, and best practices in the field.

Annexure 6: Assessment Criteria

Detailed PC-wise assessment criteria and assessment marks for the NOS are as follows:

S. No.	Assessment Criteria for Performance Criteria	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC 1.	Ability to explain fundamental concepts of metrology, calibration, and quality assurance.	40	50		10
PC 2.	Demonstration of understanding of measurement uncertainty principles and calculation methods.				
PC 3.	Explanation of temperature measurement basics and temperature sensor characteristics.				
PC 4.	Understanding of non-conformance management principles, CAPA, control charts, sampling inspection, and statistical quality control.				
PC 5.	Proficiency in using general metrology instruments for measurements and inspections.				
PC 6.	Accuracy in conducting calibration procedures for various instruments and calibrators.				
PC 7.	Competence in calculating uncertainties in measurements and preparing detailed calibration reports.				
PC 8.	Application of temperature measurement techniques and calibration of temperature sensors.				
PC 9.	Ability to manage non-conformances, implement CAPA measures, and analyze control charts and sampling inspection data.				
PC 10.	Effective communication of findings, analysis, and recommendations related to metrology and quality assurance.				
PC 11.	Continuous improvement and willingness to learn new techniques, methodologies, and technologies in the field.				
Total Marks		**40**	**50**		**10**
Grand Total		**100**			

Annexure 7: Assessment Strategy

Assessment for this NOS shall be focused on the overall theoretical and practical knowledge acquired by the learner. Since this is a foundational program that is aimed at introducing the possibilities of this technology to the learner, the assessment shall also touch on the interest generated among the learner towards the sector. ASAP follows an assessment framework that provides weightage for all the activities connected with skilling in which students get involved during the training program. The components of assessment include Attendance, Assignments, Internal Assessments, and Final Assessment. Of these, Attendance and Internal Assignment come under Continuous and Comprehensive Evaluation (CCE). All Assessments concerning the academic status of the student should be reflected as marks and overall assessment by awarding grades. The report card/certificate will state only the overall grade.

Weightages: assessment shall be done with 60% weightage for practical components and 40% weightage for the theoretical part. The outcome-based assessment followed by the Assessment Division for the course offered will have the following design:

Type of Assessment	**Max Marks**
Internal Assignment during 50% completion of the course.	40
Attendance	10
Final exam	100
Total	150

Attendance criteria: For each course and batch, the student's attendance will be marked daily, and marks will be awarded accordingly on course completion before the final assessment. Students whose attendance falls below 70% will not be eligible for the final assessment and course completion certificate.

Attendance	Marks
Above 90%	10
86 to 90%	8
80 to 85%	5
70 to 80%	3
Below 70%	0

Assignments: Students can complete assignments according to his/her preferred approach. This might involve reading technical study materials, chapters and assigned reading materials to gain a better understanding prior to completing an assignment or exploring new resources to gain additional information. There shall be no restriction on the resources that the students are allowed to consult or any limit to the number of hours he/she choose to spend on the assignment. Since each student employs his/her own personal learning style, an individual assignment may actually be a fairer measure of the student's learning. assignments shall be evaluated and assigned a score. The scores shall be marked on the student's assignment sheets by the Trainer after evaluation.

Final Assessment: The Assessment Division with the support of the Curriculum Division and Cluster will prepare the Question Bank. The Question Bank is prepared at the time of initial course creation by Subject Matter Experts identified by the Curriculum division in consultation with the respective Cluster. Randomly selected questions from the Question bank developed will be used for Final Assessments. 20% of questions will be replaced with new ones every year and a blueprint that elaborates weightage to QP/NOS, degree of difficulty and application-type questions will be used for the assessment.

The Question Bank will be used to prepare the question paper for the final assessment. The assessment division shall conduct the assessment through the assessors. The assessment shall be monitored by the assessors on the assessment platform. The final answer sheets shall be evaluated by experts in the field and the final scores with grades shall be shared by the assessment division to the certification division for final certificate issue.

Grading Scheme: ASAP Kerala shall be following the below-mentioned grading scheme

Percentage range	Grade Score
90-100	A+ (Excellent)
80-89.9	A (Very Good)
70-79.9	B (Good)
60-69.9	C (Above Average)
50-59.9	P (Pass)

Annexure 8: Acronym and Glossary

Acronym

Acronym	Description
AA	Assessment Agency
AB	Awarding Body
NCrF	National Credit Framework
NOS	National Occupational Standard(s)
NQR	National Qualification Register
NSQF	National Skills Qualifications Framework
QA/QC	Quality Assurance/Quality Control
ToT	Training of Trainers
ToA	Training of Assessors
MS	Multi-skill
CS	Cross Sectoral
CAPA	Corrective and Preventive Actions
FMEA	Failure Mode and Effects Analysis
KU	Knowledge and Understanding
GS	Generic Skills

Glossary

Term	Description
National Occupational Standards (NOS)	NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do.
Qualification	A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards
Qualification File	A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification.
Sector	A grouping of professional activities on the basis of their main economic function, product, service or technology.