



# Technical Training Program for Calibration Laboratory Personnel



**Venue: CMTI Campus, Tumkur Road, Bangalore-560022**  
**Dates: 09,10 and 11<sup>th</sup> February 2023**

## Objectives:

- To train laboratory personnel (around 300) in various parameters simultaneously under same platform.
- To build robust metrology infrastructure in India towards “Atmanirbhar Bharat”
- To ensure calibration done at one place, acceptable everywhere for its uniform method/ technique

## Scope of Training:

- Training to meet requirements of competency enhancement of personnel required as per ISO/IEC 17025:2017
- Training for continual improvement and for updating skill and knowledge required for calibration personnel
- Ensure to produce technically valid results in-line with Global Metrology practices
- Various presentations and discussion on EURAMET cg4 requirement for Force proving instruments calibration, requirement of latest ISO 6789:-1 & 2 2017 for Torque indicating devices/ standard deviation, type A , EURAMET cg 3 for DWT, latest version requirement in IS 4787 & ISO 8655, dynamic weigh bridge Calibration, Pyrometer/ IR Thermometer Calibration in Thermal, etc in respective calibration disciplines
- Salient features of calibration, estimation of CMC as per NABL 143 to maintain uniformity in claim of scope of accreditation, uncertainty analysis, effect of environmental conditions, do's and don't during calibration.
- Common platform for interaction with experts in relevant discipline/ groups
- Support to produce globally acceptable Quality products and services in line with the IS, ISO, regulatory agencies, and other national /international standards.

## Whom to enrol:

Personnel from calibration and testing laboratories, quality control departments, etc.

Register through Link: <https://forms.gle/YN93JCNQPZihBXk7> or QR Code





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## Details of Technical Training Program

**Restricted to 30 Participants in each group**

<b>Group-C1: Dimension - Measuring Instruments, Gauges, Reference Masters</b>	
Steel Scales & Tapes, Callipers, Micrometers, Dial Gauges, Bore Gauges, Height Gauges, Bevel Protractors, Angle Gauges, Surface Plates, Granite Squares, Plug/ Ring Gauges, Thread Plug/ Ring Gauges, Gauge Blocks (Slip Gauges), Step Gauges/ Caliper Checkers, Form Masters, Roughness Masters	09 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> February 2023
<b>Group-C2: Dimension - Measuring Equipment</b>	
Profile Projector / Video Measuring Machines, Dial Calibration Testers, CMM, Roundness/ Form Tester, Roughness Tester, Calibration of Measuring Equipment (ULM, LMM etc.) and CNC Machine Tools using LASER Interferometer System	09 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> February 2023
<b>Group-C3: Mass, Volume, Torque Tools and Pressure</b>	
Calibration of Mass, Weighing Scale, Volume, Pipette, Density of Solids & liquids, Torque wrenches, Torque Screw Drivers, Rotary Torque Tools, Pressure Gauges, Pressure transmitters using dead weight testers or digital pressure calibrators, Viscosity.	09 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> February 2023
<b>Group-C4: Force, Torque &amp; Hardness</b>	
Uniaxial Testing Machines (UTM), Rockwell, Brinell and Vickers' Hardness Testers, Rubber Hardness Testers (Shore hardness), Push Pull Gauges, Torque Measuring Devices, Force Proving Instruments, speed.	09 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> February 2023
<b>Group-C5: Electro Technical-1</b>	
Electro Technical Terminology, Interpretation of Specifications, Calibration of Multimeters, Oscilloscopes (up to 500 MHz), Resistance Meters, Power Meters, High Voltage Testers, Calibration of RF instruments i.e. RF Power Meters, Frequency Meters, Signal Generators	09 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> February 2023
<b>Group-C6: Electro Technical-2</b>	
Terminology, interpretation of specification, calculation of EMC Eqpt, like: EFT, ESD, Surge, Conducted susceptibility, LISN, Voltage dips and interruption etc., Estimation of uncertainty in measurement. RF equipment's like signal generators, spectrum analyzers, RF power meters, Network analyzers and Frequency counter.	09 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> February 2023
<b>Group-C7: Thermal</b>	
Temperature Calibrators (Electrical simulation) both source & measure mode for different types of Thermocouples & RTDs, Calibration of contact type temperature sensor, (RTDs, Thermocouples, Digital, Temperature Indicator, data logger, controller, and recorder). Liquid-in-Glass Thermometer, Temperature Gauges, Temperature Calibration of Temperature Block Calibrators, Calibration of Infrared Pyrometers, Onsite calibration of Oven, Furnaces, Heating/ Cold Chambers, Liquid baths/dry, block furnaces, environmental chamber, calibration of Env chambers and uncertainty measurements.	09 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> February 2023
<b>Group-C8: Fluid Flow</b>	
Calibration of Flow Meters used for liquids and gases	09 <sup>th</sup> , 10 <sup>th</sup> , 11 <sup>th</sup> February 2023



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## Important Notes to Participants

- 1) The contents of the above groups may change based on faculty, time and equipment availability.
- 2) Each Participant can register only one of the above subgroups.
- 3) Minimum of 10 participants/ group is required to conduct a separate group
- 4) Since number of participants are restricted for each group, registration will be on first come first serve basis.
- 5) Training certificate will be issued by CMTI at the end of training.
- 6) We will not be able to post the uncollected certificate. Hence request you to collect at the end of training program from CMTI.
- 7) Travelling, boarding, lodging are to be borne by the participants (hotels can be found nearby CMTI).
- 8) Breakfast (between 8.15 am to 9.15 am), tea, lunch and high tea will be served during the training period

## Registration fee per participant:

- 1) For Indian participants Rs 10,000/- + 18% GST = 11,800/-
- 2) For Foreign participants USD 275

## Registration and mode of payment:

- i) Register through Link: <https://forms.gle/YN93JCNQPZihBXk7> or QR Code
- ii) Transfer money through bank by RTGS/NEFT in favour of "Central Manufacturing Technology Institute" payable at Bangalore. A) Bank Name: ICICI Bank Ltd., Yeshwantpur Branch B) A/c No: 028701002042 C) IFSC code: ICIC0000287
- iii) Cheque/ Demand Draft drawn in favour of "Central Manufacturing Technology Institute" payable at Bangalore and it is to be sent to the below address: Central Manufacturing Technology Institute, Tumkur Road, Bangalore-560022 Kind Attn: K. Niranjana Reddy, CH (MNTM)
- iv) Our GST no: 29AAATC2085K1ZJ

To Contact by Email: [cmti.nabltrq@gmail.com](mailto:cmti.nabltrq@gmail.com)



## Organizing Members:

<b>CMTI</b>	<b>NABL</b>	<b>NABL</b>
<b>K. Niranjana Reddy</b> Scientist F & CH (MNTM) 094498 42672	<b>Srikanth</b> Director 099100 91972	<b>Avijit Das</b> Senior Director 098713 39210
<b>Facilitator</b> <b>R Sadananda murthy, NABL Assessor</b> 099720 13326		