

VICE DIRECTORATE OF PHYSICAL METROLOGY

Course: Dimensional Metrology, Level 1

Intended for:

The course is intended for professionals and technicians whose activities involve the use of the instruments covered in the course content.

Identification:

Course name	Dimensional Metrology Level I	Course duration	Four (4) days–32 hours
Minimum # of slots	Four (4) people	Maximum # of slots	Eight (8) people
Place	The courses are taught at the Instituto Nacional de Metrología, located on Avenida Carrera (AK) 50 No. 26-55, Int 2 (CAN), Bogotá D.C.	Cost	Resolution & current rate
For information & registration: www.inm.gov.co link http://www.inm.gov.co/index.php/serviciosinm/capacitacion Tel. (571) 254 22 22 extensions 1417 & 1428			

Course Objective:

Define the function of traceability in each of the processes of industry, commerce, and the academic sector.

Teach practical theoretical foundations to the industrial, commercial, research, and academic sectors relating to the handling and calibration of length measurement instruments such as: measuring tape, graduated rulers, calipers, micrometers for outside measurement, and dial comparators; and that correspond to instruments' use in industrial processes that guarantee the precision of instruments under the requirements of norms and standards.

Course Content:

Day One

1. Basic terms and definitions of dimensional metrology.
2. Visit the Dimensional laboratories
3. Theory about tape and rulers
4. Calibrating measuring tape under Recommendation 35 of OIML 2007
5. Calibrating a graduated ruler using Recommendation 35 of OIML 2007 for reference
6. Estimating the uncertainty of tape based on JCGM 100:2008, Evaluating Measurement Data –Guide to the Expression of Measurement Uncertainty. Digital edition 1 in Spanish (translation 1ª Ed. Sept. 2008).
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Day Two

1. Calibrating a graduated ruler using Recommendation 35 of OIML 2007 for reference
2. Estimating the uncertainty of a ruler calibration based on JCGM 100:2008, Evaluating Measurement Data –Guide to the Expression of Measurement Uncertainty. Digital edition 1 in Spanish (translation 1ª Ed. Sept. 2008). Centro Español de Metrología - CEM
3. Management of rectangular block standards with parallel faces based on ISO 3650:1999

Day Three

1. Theory about calipers using NTC 4303 1997-11-26 for a reference on the maximum permissible error
2. Calibrating calipers using for reference the Guide to Uncertainty in the Calibration of Vernier Caliper Calibrators. Centro Nacional de Metrología- CENAM.2001 Héctor González Muñoz. And, also, Procedure DI-008 for the Calibration of Calipers. Centro Español de Metrología-CEM
3. Estimating the uncertainty of a caliper calibration based on JCGM 100:2008, Evaluating Measurement Data –Guide to the Expression of Measurement Uncertainty. Digital edition 1 in Spanish (translation 1ª Ed. Sept. 2008). Centro Español de Metrología - CEM

Day Four

1. Theory about micrometers using NTC 4352 1997-11-26 for reference on the maximum permissible error
2. Micrometer handling & measurement practice
3. Calibrating a micrometer according to Procedure DI-00 CALIBRATING TWO POINT CONTACT OUTSIDE MICROMETERS. Centro Español de Metrología- CEM and the Technical Guide to Metrological Traceability & Measurement Uncertainty in Dimensional Metrology. CENAM Centro Nacional de Metrología de México – EMA Entidad Mexicana de Acreditación, A.C. December 2013
4. Estimating the uncertainty of a micrometer calibration, based on JCGM 100:2008, Evaluating Measurement Data –Guide to the Expression of Measurement Uncertainty. Digital edition 1 in Spanish (translation 1ª Ed. Sept. 2008). Centro Español de Metrología- CEM
5. Dial comparator theory taking into account NTC 4513 1998-10-28 for the maximum permissible error
6. Handling and measurement practices with a dial comparator
7. Calibrating a dial comparator according to the document “Uncertainty in the Calibration of Dial Indicators.” Centro Nacional de Metrología- CENAM. 2002 Carlos Colín Castellanos.
8. Estimating the uncertainty of dial comparator calibrations based on JCGM 100:2008, Evaluating Measurement Data –Guide to the Expression of Measurement Uncertainty. Digital edition in Spanish (translation 1ª Ed. Sept. 2008). Centro Español de Metrología- CEM

Requirements

The participant should:

- Have taken the Basic Metrology Course
- Have basic knowledge of statistics
- Preferably have access to a laptop computer or, in its absence, a scientific calculator with statistical functions

Important Information

In the event of partial attendance (missing more than 20% of the course) on the part of the participant, the INM will not award an "Attendance Certificate" or refund money from the course payment.

The courses are taught in the Instituto Nacional de Metrología located on Avenida Carrera (AK) 50 No. 26-55, Int 2 (CAN), Bogotá D.C., from 8:15 to 17:00 hours.

Users should consult about the availability of space before depositing payment: Tel. (571) 254 22 22 extensions 1417 & 1428.