

VICE DIRECTORATE OF PHYSICAL METROLOGY

Course: Force Metrology

Intended for:

This course is designed for professionals and technicians with basic knowledge of mathematics and (mechanical) physics who perform metrological activities in Materials Testing Laboratories, Quality Control and/or Force Metrology Laboratories.

Identification:

Course name	Force Metrology	Course duration	32 hours
Minimum # of slots	Four (4) people	Maximum # of slots	Eight (8) people
Place	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	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 Objectives:

<p>1. GENERAL OBJECTIVE: Develop and provide theoretical and practical tools for the application of existing norms on the calibration and classification of Materials Testing Machines according to NTC ISO 7500-1:2007</p> <ul style="list-style-type: none">• Define the magnitude of force and deduce its unit in the International System of Units (SI) along with its respective equivalencies in other systems of units• Define existing norms and technical requirements for the calibration of materials testing machines• Acquire theoretical-practical knowledge and skills for the performance of calibrations of materials testing machines• Define the calibration methods for testing machines and their respective classification• Identify and learn the appropriate procedure for data collection, calculating errors and measurement uncertainty, interpreting results and classifying testing machines.
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Course Content:

Day One

1. Review the metrological definitions and concepts that apply to force (VIM-2008).
2. Review definitions and concepts of Mechanics
3. Unit of measurement of force and its equivalent in other systems of units
4. Hierarchy of force standards and traceability
5. Colombian & international technical norms
6. Recognizing working standards and primary standards

Day Two

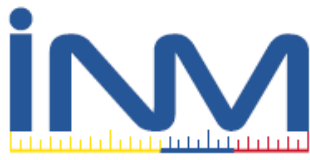
1. Study Colombian technical norm NTC ISO 7500-1:2007
2. Classification of force meter standards according to ISO 376:2011 and its correlation to ISO 7500-1:2007

Day Three

1. Calibration practice, testing machine and dynamometers
 - a. Preparation and selection of the equipment needed to calibrate testing machines
 - b. General Inspection of the Testing Machine
 - c. Applying calibration protocols
 - d. Standards selection and set-up
 - e. Preloading
 - f. Loading – measurement series
 - g. Interpreting the standard's calibration certificate

Day Four

1. Processing data
2. Calculation of error (precision, repeatability, zero, reversibility, effect of indication accessories), relative resolution
3. Interpreting results and classifying testing machines
4. Elaborating calibration certificates and their technical scope
5. Evaluation



Requirements

Participants should:

1. Have taken the Basic Metrology Course
2. Have taken the Statistics Course
3. Have taken the Measurement Uncertainty Course
4. Have a laptop computer or scientific calculator
5. For the laboratory practice, safety boots are required
6. Have Colombian Technical Norms NTC ISO 7 500-1:2007 & NTC ISO 376:2013

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.