



CSIR- National Physical Laboratory

Dr. K. S. Krishnan Marg, New Delhi -110012



Training Calendar 2017-18

GENERAL INSTRUCTIONS

- In case of inadequate number of participants (**less than 10**), for a particular training programme, CSIR-NPL may drop the execution of that programme. In view of this, before sending the DD, the prospective participants are advised to confirm with the Head, HRD or the concerned Technical Coordinator about its dates and execution.
- For Technical Queries about a training course, the prospective participants may contact the concerned Technical Coordinator.
- **Training Fee / Charges : Per Participant:**

	2 Days Course	3 Days Course	4 Days Course
Indian Participants	₹16,000	₹24,000	₹32,000
Foreign Participants	US \$ 300	US \$ 450	US \$ 600

Service Tax as applicable.

The Training fee includes Course Material, Training kit, Lunch, Tea / Coffee, etc.

The Training fee should be sent at least two weeks prior to the commencement of the desired training programme, through a **Demand Draft** drawn in favour of the "**DIRECTOR, NATIONAL PHYSICAL LABORATORY**", payable at "**NEW DELHI**".

Online transfer is also acceptable through **Syndicate Bank Account No. 91002010030018**, NPL, PUSA, NPL Campus **IFSC Code SYNB0009100**. Kindly confirm the NEFT transfer details through e-mail.

Lodging & Boarding:

Charges to be borne by the Trainees – As per prevailing rates in the NPL Guest House (**Subject to availability**)

- For any Enquiries, the participants are advised to contact :

Dr. R. P. Pant
 Chief Scientist & Head, HRD
 National Physical Laboratory, New Delhi – 110012
 Ph.: 91-11- 4560 9366, 4560 9361 (O)
 e-mail : hrd@nplindia.org

S.No.	Title of Training Programme	Date & Duration	Content of Programme	Technical Co-ordinator (s) with Contact Details
1.	Optical Radiation Metrology	Apr 24-26,2017 (3 Days)	Introduction to photometric and radiometric parameters, Standards of Optical Radiation, Photometric and radiometric parameters of industrial importance, e.g. Luminous intensity, illuminance, luminous flux, luminance, responsivity, CCT, spectral irradiance, spectral transmittance, absorbance etc. and their measurement and calibration	Dr. Ranjana Mehrotra ranjana@nplindia.org 011-4560 8315 Mr.V.K. Jaiswal jaiswalvk@nplindia.org 011-4560 8228 Dr. Parag Sharma sharmap2@nplindia.org 011-4560 8228
2	Training on Roughness and Roundness Measurement	April 27-28, 2017 (2 days)	Introduction to Roughness and roundness parameters, Standards of roughness and roundness, relevant Indian Standards and measurements demonstrations	Dr. Rina Sharma rina@nplindia.org 011-45609275 Ms. Girija Moona moonag@nplindia.org 011-47091669
3	Applications of Laser interferometers for Dimension Measurements and Calibration of Gauge Block Interferometers	July 13-14, 2017 (2 days)	Introduction to Displacement measuring interferometers, Gauge Block Interferometer and flatness interferometer, Gauge blocks, optical flats relevant Indian Standards, Calibration method and demonstration of calibration using these Interferometers, Sources of error and uncertainty Budget	Dr. Rina Sharma rina@nplindia.org 011-45609275 Ms. Girija Moona moonag@nplindia.org 011-47091669
4	Fluid Flow and Pressure Metrology	July 26-28, 2017 (3 Days)	Introduction to fluid flow measurements, types of fluid flow standards (primary, secondary, reference/ transfer standards), various types of flowmeters and their applications, testing and calibration procedures of water meters, water flowmeters and gas flowmeters (as per IS 779, IS 6784, ISO 4064, ISO 4185, etc.). Measurement of Pneumatic and Hydraulic Pressures, Primary and Secondary Pressure Standards, Calibration Procedures of Industrial Pressure Gauges, Transducers and Dead Weight Testers.	Dr. Shiv Kumar Jaiswal skjaiswal@nplindia.org 011-4560 9426 Dr. Sanjay Yadav syadav@nplindia.org 011-4560 8526
5	Force and hardness metrology	August 02- 04, 2017 (3 days)	Precision measurement of force, torque and hardness, primary and secondary methods, Calibration of force proving instruments, torque measuring devices, standard hardness blocks in Brinell, Vickers and Rockwell scales, Calibration procedure and method of UTM, torque wrenches and hardness testing machines.	Dr. S S K Titus 011-4560 8680 Mr. Rajesh Kumar kumarr@nplindia.org 011-4560 8672
6	Mass, Volume, Density and Viscosity Metrology	August 07-09, 2017 (3 Days)	Procedures and methodology for calibration of weights, weighing balances, volumetric instruments, hydrometers, viscometers and viscosity oils	Mr. Anil Kumar kumarak1@nplindia.org 011-4560 8348 Mr. Goutam Mandal goutam@nplindia.org 011-4709 1139 Dr. Harish Kumar 011-4560 8502 kumarh@nplindia.org

7	Pressure and Vacuum Metrology	August 22-24, 2017 (3 Days)	Measurement of barometric, high vacuum, pneumatic and Hydraulic Pressures, Primary and Secondary Pressure and Vacuum Standards, Calibration Procedures of Industrial Pressure and Vacuum Gauges, Transducers and Dead Weight Testers.	Dr. Sanjay Yadav syadav@nplindia.org 011-4560 8526 Dr. Nita Dilawar Sharma ndilawar@nplindia.org 011-4560 8488 Dr. Ashok Kumar 011-4560 8533 ashok553@gmail.com
8.	Temperature and Humidity standards	Sep 19- 22, 2017 (4 days)	1. Lectures on basic concepts in temperature metrology, Importance of international temperature scales, ITS-90, Realization of temperature fixed points, Calibration and practices in temperature metrology related to SPRT, LIGT, TCs and Pyrometry, instrumentation, measurement techniques and procedure for uncertainty evaluation in the temperature related metrology and hygrometry. 2. Practical demonstration & training on calibration procedures, calculations, reports etc., for LIG thermometers, SPRTs, RTDs thermocouples, Hygrometers and Pyrometers Estimation & reporting of uncertainty in the temperature and humidity related metrology.	Dr. Ranjana Mehrotra ranjana@nplindia.org 011-4560 8315 Dr. D. D. Shivagan shivagand@nplindia.org 011-4709 1379 / 1693
9	Time and Frequency metrology	September 20-22, 2017 (3 days)	General introduction of time and frequency measurements, Fundamentals of atomic clock, Time scale, uncertainty and stability, Calibration techniques, hands-on training and evaluation of uncertainty, Time dissemination services- Telephone & internet services, Cesium fountain frequency standard, Future atomic clocks.	Dr. V. N. Ojha vnojha@nplindia.org 011-4560 8593
10	2 Training on Roughness and Roundness Measurements	Sep 21- 22, 2017 (2 days)	Introduction to Roughness and roundness parameters, Standards of roughness and roundness, relevant Indian Standards and measurements demonstrations	Dr. Rina Sharma rina@nplindia.org 011-45609275
11	Acoustics and Vibration Metrology	September 25-27, 2017 (3 Days)	Sound and Vibration Measurement, Analysis and Control, Primary and Secondary of Sound and Vibration Standards, Calibration Procedures of Sound Level Meter, Vibration Meter, Accelerometer, etc. Measurements in Building Acoustics.	Dr. Mahavir Singh mahavir.acoustics@gmail.com 011-4560 8317 Dr. Naveen Garg ngarg@nplindia.org 011-4560 2402 Dr. Kiri Soni soniks@nplindia.org 011-4560 2129

12	Dimensional Metrology using CMM and LMM	October 12-13, 2017 (2 days)	Introduction to coordinate metrology, types of CMM, capabilities of CMM, case studies of calibration, error sources and uncertainty budget	Dr. Rina Sharma rina@nplindia.org 011-45609275 Ms. Girija Moona moonag@nplindia.org 011-47091669
13	Optical Radiation Metrology	October 25-27, 2017 (3 Days)	Introduction to photometric and radiometric parameters, Standards of Optical Radiation, Photometric and radiometric parameters of industrial importance, e.g. Luminous intensity, illuminance, luminous flux, luminance, responsivity, CCT, spectral irradiance, spectral transmittance, absorbance etc. and their measurement and calibration	Dr. Ranjana Mehrotra ranjana@nplindia.org 011-4560 8315 Mr. V.K. Jaiswal jaiswalvk@nplindia.org 011-4560 8228 Dr. Parag Sharma sharmap2@nplindia.org 011-4560 8228
14	Quality management system- laboratory management, need for calibration / accreditation as per IS/ISO/IEC- 17025: 2005	Oct 30 – Nov 02, 2017 (4 days)	(1) Requirement of quality management and process of implementation. (2) Elements of IS/ISO/IEC- 17025 : 2005- management requirements, technical requirements (3) Quality system documentation (4) internal audit (5) Exercises.	Mr. Anil Kumar kumarak1@nplindia.org 011-4560 8348 Mr. M. A. Ansari ansari@nplindia.org 011-4560 8597 / 9317
15	Workshop on Advanced Materials Characterization Techniques	Nov 06- 09, 2017 (4 Days)	Familiarization & demonstration of various Materials Characterization Techniques, such as – XRD, XRF, HRXRD, XRR, SEM, TEM, EPR, HRTEM, SIMS etc.	Dr. R.P. Pant rppant@nplindia.org 011-4560 8309 Dr. A.K. Srivastava aks@nplindia.org 011-4560 9308 Dr. K. K. Maurya kkmaurya@nplindia.org 011-45608295
16	Evaluation and expression of uncertainty in measurements	Nov 09 -11, 2017 (2 Days)	Definition of terms related to uncertainty in measurements, Type A and Type B methods, relevant probability distributions, Evaluation and expression of uncertainty in measurements as per ISO GUM, few case studies.	Dr. Rina Sharma rina@nplindia.org 011-45609275 Dr. V. N. Ojha vnojha@nplindia.org 011-4560 8593
17	Calibration of Angle measuring equipments and artefacts and optical Flat	Jan 18-19, 2018 (2 days)	Introduction to Angle measurement, angle measuring instrument, calibration angle gauges, levels, polygons etc. calibration procedure, error sources and uncertainty budget	Dr. Rina Sharma rina@nplindia.org 011-45609275 Ms. Girija Moona moonag@nplindia.org 011-47091669
18	Pressure and Vacuum Metrology	February 7-9, 2018 (3 Days)	Measurement of barometric, high vacuum, pneumatic and Hydraulic Pressures, Primary and Secondary Pressure and Vacuum Standards, Calibration Procedures of Industrial Pressure and Vacuum Gauges, Transducers and Dead Weight Testers.	Dr. Sanjay Yadav syadav@nplindia.org 011-4560 8526 Dr. Nita Dilawar Sharma ndilawar@nplindia.org 011-4560 8488 Dr. Ashok Kumar 011-4560 8533 ashok553@gmail.com
19	Force and hardness metrology	February 12 – 14, 2018 (3 days)	Precision measurement of force, torque and hardness, primary and secondary methods, Calibration of force proving instruments, torque measuring devices, standard hardness blocks in Brinell, Vickers and Rockwell scales, Calibration procedure and method of UTM,	Dr. S S K Titus titus@nplindia.org 011-4560 8680 Mr. Rajesh Kumar kumarr@nplindia.org 011-4560 8672

			torque wrenches and hardness testing machines.	
20	Fluid Flow and Pressure Metrology	March 19-21, 2018 (3 Days)	<p>Introduction to fluid flow measurements, types of fluid flow standards (primary, secondary, reference/ transfer standards), various types of flowmeters and their applications, testing and calibration procedures of water meters, water flowmeters and gas flowmeters (as per IS 779, IS 6784, ISO 4064, ISO 4185, etc.).</p> <p>Measurement of Pneumatic and Hydraulic Pressures, Primary and condary Pressure Standards, Calibration Procedures of Industrial Pressure Gauges, Transducers and Dead Weight Testers.</p>	<p>Dr. Shiv Kumar Jaiswal skjaiswal@nplindia.org 011-4560 9426</p> <p>Dr. Sanjay Yadav syadav@nplindia.org 011-4560 8526</p>
21	Acoustics and Vibration Metrology	March 26-28, 2018 (3 Days)	<p>Sound and Vibration Measurement, Analysis and Control, Primary and Secondary of Sound and Vibration Standards, Calibration Procedures of Sound Level Meter, Vibration Meter, Accelerometer, etc. Measurements in Building Acoustics.</p>	<p>Dr. Mahavir Singh mahavir.acoustics@gmail.com 011-4560 8317</p> <p>Dr. Naveen Garg ngarg@nplindia.org 011-4560 2402</p> <p>Dr. Kiri Soni 011-4560 2129 soniks@nplindia.org</p>