



CSIR- National Physical Laboratory

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

Training Calendar 2018-19

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 | 5 Days Course |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| Indian Participants | ₹16,000 | ₹24,000 | ₹32,000 | ₹40,000 |
| Foreign Participants | US \$ 300 | US \$ 450 | US \$ 600 | US \$ 750 |

GST 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. In remarks column of NEFT please mention “HRD, NPL”

• **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. Anurag Gupta , Principal 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. | Joint Training Programme on Optical Radiation Metrology & Temperature and Humidity Metrology | May 07-10, 2018 (4Days) | 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 & Lectures on International temperature scales (ITS-90), Realization of temperature fixedpoints, Calibration and practices inSPRT, LIGT, TCs and Pyrometry, Humidity calibrations. Estimation & reporting of uncertainty inthe temperature and humidity. | 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 Dr. D.D. Shivagan shivagand@nplindia.org 011- 4709 1379 / 1693 |
| 2. | Training Programme on Length, Dimension and Nano Metrology | Jun 21-22, 2018 2 Days | Introduction to form metrology terms, Brief overview about the form tester and interferometers-applications and | Dr. Rina Sharma rina@nplindia.org , Dr. Mukesh Jewaria Jewariya.mukesh@nplindia.org |

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| | | | capabilities. Best measurement practices using with case study, sources of error and uncertainty evaluation. | mukesh@nplindia.org +91-11-47091669 |
| 4. | Training Programme on Length, Pressure, Force, Torque and Temperature Metrology | July 2-5, 2018 4 Days | Length, Pressure, Force, Torque and Temperature Metrology | Dr. Rina Sharma rina@nplindia.org Dr. Sanjay Yadav syadav@nplindia.org 011-4709 1206 Dr. SSK Titus titus@nplindia.org Dr. D.D. Shivagan shivaganD@nplindia.org |
| 5. | Training Programme on ISO-IEC 17025:2017 (upgradation training) | July 6, 2018 1 Day | ISO-IEC 17025:2017 (upgradation training) | Mr. Anil Kumar Kumarak1@nplindia.org 011-45608348 |
| 6. | Training Programme on Fluid Flow and Pressure Metrology | July 9-11, 2018 (3 Days) | Introduction to fluid flow measurements, types of fluid flow standards (primary, secondary, reference/ transfer standards), various types of flow-meters and their applications, testing and calibration procedures of water meters, water flow-meters and gas flow-meters (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 | Dr. Sanjay Yadav syadav@nplindia.org 011-4709 1206 Dr. S.K. Jaiswal skjaiswal@nplindia.org 011-4560 9426 |
| 7. | Training Programme on Silicon Photovoltaics: Cell to module | 9-13 July 2018 (5 Days) | Fundamentals of Solar cells, Introduction to cell technology and cell measurements, Solar cell design and output parameters, Introduction to PV metrology, Lab | Mr. CMS Rauthan cms.rauthan@nplindia.org 011-45721078 |

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| | | | experiments related with solar cell processing and measurements, and solar modules studies under artificial and natural light | |
| 8. | Training Programme on Organic Photovoltaics & Electronics Technology 2018 | 23 rd to 27 th July 2018 (5 Days) | General Background of organic semiconductor devices. Design Optimization of organic/Perovskite PVs. Process development for low-cost flexible organic/perovskite solar device/modules Characterization Techniques (Basics to advance)and few talks related optoelectronic devices | Dr. Ritu Srivastava ritu@nplindia.org 011-45608654/8644 |
| 9. | Training Programme on Mass and Pressure Metrology | August 8-10, 2018 (3 Days) | Procedures and methodology for calibration of weights, weighing balances, Measurement of barometric, high vacuum, pneumatic and Hydraulic Pressures, Primary and Secondary Pressure Standards, Calibration Procedures of Industrial Pressure Gauges, Transducers and Dead Weight Testers. | Mr. Anil Kumar kumarak1@nplindia.org 011-4560 8348 Dr. Sanjay Yadav syadav@nplindia.org 011-4709 1206 |
| 10. | Training Programme on Air Quality Measurements | August 29-31, 2018 (3 days) & January 28-30, 2019 (3 days) | National ambient air quality standards (NAAQS), gas measurement techniques (greenhouse and pollution gases), PM10 and PM2.5 measurements and their calibration (gravimetric sampler, BAM), gas standards and calibration of analyzers, analysis of particulate bound chemicals using ICP-OES, data quality assurance, uncertainty calculations, quality system | Dr. V.N. Ojha vnojha@nplindia.org 011- 4560 8290 / 8593 Dr. (Mrs.)P. Johri pjohri@nplindia.org 011- 4709 1628 Dr. S.G. Aggarwal 011-45608331 aggarwalsg@nplindia.org Dr. (Mrs.) D. Soni 011-4560 8392 dsoni@nplindia.org |

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| | | | (with hands-on training on most of the parameter of NAAQS). | |
| 11. | Time & Frequency Metrology | September 10 -14, 2018, (5Days) | (1) SI system of units, SI second and its realization, (2) Fundamental of Frequency Standards (3) National Time Scale, Uncertainty and Stability (4) Time synchronization center (5) Time Dissemination Methods(6) Application of Accurate Timing systems | <p>Dr. V N Ojha vnojha@nplindia.org 011-4560 8593</p> <p>Dr Ashish Agarwal ashish@nplindia.org 011-4560 8384</p> |
| 12 | Training on “Fundamentals and Applications of Gas Chromatography” | Sep 12-14, 2018 (3 days) | <p>1. Lectures on fundamentals of gas chromatography, columns, detectors etc. and its applications in different fields</p> <p>2. Practical demonstration and training on gas chromatography technique using standards and environmental samples</p> | <p>Dr . C. Sharma csharma@nplindia.org 011-45608299</p> <p>Dr. Monika J. Kulshrestha monikak@nplindia.org 011-45608383</p> |
| 13. | Training Programme on Temperature & Humidity Metrology Section | September 24-26,2018 (3Days) | (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 | <p>Dr. D. D. Shivagan shivagand@nplindia.org 011-4709 1379/1693</p> <p>Dr.RanjanaMehrotra ranjana@nplindia.org 011-4709 1379/1693</p> |

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| | | | 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. | |
| 14. | Training Programme on Acoustics and Vibration Metrology | September 26-28, 2018 (3 Days) | Sound and Vibration Measurement, Analysis and Control, Primary and Secondary of Sound and Vibration Standards, Calibration Procedures of Sound Level Meter, Sound Calibrator, Vibration Meter, Accelerometer, etc.; NRC & STC 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 011-4560 9346 soniks@nplindia.org |
| 15. | Training Programme on Optical Radiation Metrology | Oct 24-26,2018 (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 |
| 16. | Training Programme on Pressure, Vacuum and Force Metrology | Oct. 29-31, 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, | Dr. Sanjay Yadav syadav@nplindia.org 011-4709 1206 Dr. Nita Dilawar Sharma ndilawar@nplindia.org 011-4709 1207 Dr. S S K Titus titus@nplindia.org 011-4560 8680 Dr. Ashok Kumar |

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| | | | Transducers and Dead Weight Testers. Precision measurement of force, torque and hardness, primary and secondary methods, Calibration of force proving instruments, torque measuring devices, | 011-4560 8533 ashok553@gmail.com |
| 17. | Training Programme on Electrical Metrology | 14-16 Nov 2018 (3 Days) | Training on measurement of electro-technical parameters including HVDC, HVAC, AC Power and Energy, LF, HF Impedance, DC, AC Voltage, Current and Microwave Metrology | R.S Meena, Sr. Scientist, meenars@nplindia.org, 01145608362. Satish, Scientist singhsp3@nplindia.org, 01145608510/ 01147091176 |
| 18. | Training Programme on Length, Dimension and Nano Metrology | November 15-16, 2018 2 Days | Introduction to coordinate metrology, Brief overview about the CMM its applications and capabilities. Best measurement practices using a CMM with case study, sources of error and uncertainty evaluation. | Rina Sharma rina@nplindia.org , moonag@nplindia.org vinodk@nplindia.org +91-11-47091669 |
| 19. | Training Programme on Silicon Photovoltaic Measurements | 10-14 December 2018 (5 Days) | Basics of solar cells, PV Measurements & Metrology and related experiments, Measurements on PV modules, Module testing & Reliability studies in field, IEC standards for PV modules & Product certification | Mr. CMS Rauthan cms.rauthan@nplindia.org 011-45721078 |
| 20. | Training Programme on Fluid Flow, Force and Pressure Metrology | Dec. 11-13, 2018 (3 Days) | Introduction to fluid flow measurements, types of fluid flow standards (primary, secondary, reference/ transfer standards), various types of flow-meters and their applications, testing and calibration procedures of water meters, water flow-meters and gas flow-meters | Dr. Sanjay Yadav syadav@nplindia.org 011-4709 1206 Dr. S S K Titus titus@nplindia.org 011-4560 8680 Dr. S.K. Jaiswal skjaiswal@nplindia.org 011-4560 9426 |

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| | | | (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, Precision measurement of force, torque and hardness, primary and secondary methods, Calibration of force proving instruments, torque measuring devices, | |
| 21. | Training on 'Recent techniques in atmospheric measurements' | January 21-23, 2019 | A number of techniques are used to measure pollutants and understanding of physical & chemical properties of atmosphere. The training course intends to acquaint participants about these techniques. | Dr. C. Sharma csharma@nplindia.org 011-45608299 Dr. S. Singh ssingh@nplindia.org 011-45608243 Dr. Radhakrishnan S.R. rkrishnan@nplindia.org 011-45608289 |
| 22. | Training Programme on Length, Dimension and Nano Metrology | February 14-15, 2019 2 Days | Introduction to Angle measurement, angle measuring instruments, calibration angle gauges, levels, polygons etc. calibration procedure error sources and uncertainty budget | Rina Sharma rina@nplindia.org , sanjid@nplindia.org +91-11-45609490 +91-11-47091669 |
| 23. | Training Programme on Organic Photovoltaics & Electronics Technology | 18 th to 22 nd Feb 2019 (5 Days) | Organic/perovskite solar cells parameter measurements and stress test. Degradation and durability of organic/perovskite solar cells. Hands-on training on fabrication and validation of Organic/perovskite solar cells. Precise measurements in the field of organicsolar | Dr. Ritu Srivastava ritu@nplindia.org 011-45608654/8644 |

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| | | | technology and few talks related organic semiconductor devices | |
| 24. | Training Programme on Mass, Pressure and Flow Metrology | March 11-15, 2019 (5 Days) | <p>Procedures and methodology for calibration of weights, weighing balances, Density and volume</p> <p>Measurement of barometric, high vacuum, pneumatic and Hydraulic Pressures, Primary and Secondary Pressure Standards, Calibration Procedures of Industrial Pressure Gauges, Transducers and Dead Weight Testers.</p> <p>Introduction to fluid flow measurements, types of fluid flow standards (primary, secondary, reference/ transfer standards), various types of flow-meters and their applications, testing and calibration procedures of water meters, water flow-meters and gas flow-meters (as per IS 779, IS 6784, ISO 4064, ISO 4185 etc.).</p> | <p>Mr. Anil Kumar kumarak1@nplindia.org 011-4560 8348</p> <p>Dr. Sanjay Yadav syadav@nplindia.org 011-4709 1206</p> <p>Dr. S.K. Jaiswal skjaiswal@nplindia.org 011-4560 9426</p> |
| 25. | Training Programme on Acoustics and Vibration Metrology | March 26-28, 2019 (3 Days) | <p>Sound and Vibration Measurement, Analysis and Control, Primary and Secondary of Sound and Vibration Standards, Calibration Procedures of Sound Level Meter, Sound Calibrator, Vibration Meter, Accelerometer, etc.;</p> <p>NRC & STC 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. Kirti Soni 011-4560 2129 soniks@nplindia.org</p> |