



# ELECTRICAL (DC/LF) METROLOGY – PART 1

## Aim of Course

This course forms the basic building block for personnel who wish to gain a fundamental knowledge and background in making traceable measurements in the electrical field. It serves as an introduction to the fundamentals of Electrical Metrology, which is the science of accurate measurements in the following fields: AC/DC Voltage, Resistance, AC/DC Current, Uncertainty of Measurement and general metrology fundamentals.

Whilst the course has an emphasis on making measurements in a calibration environment, it is equally useful to anybody that is required to make accurate measurements in the field or process plant application as it will make the student aware of what is required to get an accurate measurement and what precautions to take to ensure the readings are reliable.

## Pre-Requisites for attending this course

- Introduction to Measurement (strongly recommended)
- Method Validation (Calibration) (strongly recommended)

## Course Overview

In this course we explore the fundamentals of electrical measurements from Ohms law, Series/Parallel resistances and a bit more. Then we focus on how a multi-meter works so that the student understands what is actually happening in the multi-meter when it is used to make measurements and what (and why) to test during a verification procedure. We spend a fair amount of time on interpreting and understanding specifications of instruments and showing why the correct Standard to UUT accuracy ratios are required. We then take the case of an unknown meter (with no specs available) and show how to determine the count, functions, ranges and probable accuracies and develop a calibration procedure for it. We also touch on the principles of uncertainty of measurement and what to consider at this level of measurement accuracy.

Where possible, practical exercises will be done.

## Course requirements

Attendees are expected to have an understanding of the basics of electricity, e.g. Voltage, Current, and Ohm's Law etc.

A scientific calculator (such as a Sharp EL 531 or similar) must be brought by each student. (Pens, Paper, Course notes, Tea/Coffee and Lunch will be provided). Arrangements can normally be made for special dietary requirements but please advise the NLA-SA at least a week before the course is due to start.

## Who should attend?

Electricians, instrumentation & process control technicians, metrologists and testing laboratory personnel.

## Course Duration

5 Days

## Evaluation

Attendance of the course, daily tests and the passing of a final examination are required (counting typically 30% for Daily tests and 70% for the Final Exam) in order to successfully complete this course.

The examination will be written approximately two weeks after the completion of the course.

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