



Practical Uncertainty of Measurement Course – Electrical (DC/LF) Metrology

Aim of course

The course couples the metrology discipline specific course material with the Uncertainty of Measurement (UoM) material by using practical hands-on examples. This is a three-day intense course where there will be a brief refresher on UoM and DC/LF Metrology principles and then practical experiments will be conducted with the required UoMs calculated.

Pre-Requisites for attending this course

The course expects that the metrologist has a good understanding of the field of metrology and the principles of UoM. It is thus **required** that the metrologist has completed both of the following courses and that they bring their course material and calculators with them to this course:

- Uncertainty of Measurement – GUM (Physical)
- Electrical (DC/LF) Metrology – Part 1

It is also **preferred** that they have completed these courses:

- Introduction to Measurement
- Method Validation (Calibration)

Course Overview

Introduction

Experience and feedback from metrologists have shown that though they have completed both the DC/LF Metrology and UoM courses they still encounter difficulty in applying some of the measurement theory and particularly in relating the UoM principles to the practical work to be done in their field of measurements. Using practical measurement tasks, this course combines the measurement skills with the appropriate UoM considerations to ensure that the two disciplines are brought together and that the metrologist leaves the course armed with practical measurement experience and model UoM calculations.

Typical practical tasks

- a) Low resistance measurements.
- b) High resistance measurements.
- c) Substitution resistance measurements.
- d) Vdc & Vac measurements.
- e) Basic 3½ Digit DMM calibration based on a provided DMM specification only.
- f) Circuit Loading – Input impedance & burden.
- g) Ratio measurements.
- h) Bandwidth measurements.

Analysis of the calibration data

During the practical examples, metrologists will need to analyse the data to see if it reflects the required purpose. Some examples will show how easy it is to get the wrong result, if the proper precautions are not taken.

Measurement error and uncertainty

Some examples will require error correction to be applied to the measurements and all the examples will require an analysis and calculation of the uncertainty of measurement.

Who should attend?

Metrologists who have completed the required courses and have some laboratory experience, who wish to gain experience in combining measurement techniques with the appropriate UoM calculations.

Course Duration

3 Days

Evaluation

Daily tests and the passing of a final examination are required in order to successfully complete this course.

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

NB: In order to provide adequate practical resources, the number of attendees is restricted to 9 per course.

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