UNCERTAINTY OF MEASUREMENT (ANALYTICAL MEASUREMENTS)
Chemical and Biological Laboratories

Aim of Course

During this course, students will be introduced to two complementary approaches to estimate the uncertainty associated with the measurements made in their laboratories. The first is a six-step approach based on the philosophy of the ISO Guide to the Expression of Uncertainties in Measurement (GUM) and will form the basis of the course, providing students with the basic skills to evaluate measurement uncertainties for any analytical application. In the second, more general approach, students will be shown how to use existing method validation and quality control data to estimate measurement uncertainty without the need for extensive and complicated mathematical procedures. This includes using information from reference materials analysed, proficiency testing results, quality control charts and more.

Pre-Requisites for attending this course

It is assumed that the attendee has a first degree/diploma level of knowledge in the sciences.

Course Overview

Day 1-2:   General introduction into the Estimation of Uncertainty of Measurement according to the principles described in the GUM. This includes identification and quantification of uncertainty sources (Type A and B), combining uncertainties and determination of combined standard and expanded uncertainties.

Day 3:   Students complete exercises illustrating how to use the GUM approach to estimate the measurement uncertainty for one or more general analytical laboratory applications.

Day 4:   Introduction into general concepts relating to Method Validation and Quality Control in the analytical laboratory. Using reproducibility and method and laboratory bias information to quickly and easily estimate measurement uncertainty.

Day 5:   Students complete exercises using the method validation and quality control approach to estimate measurement uncertainty for a variety of laboratory applications.

Throughout the course students are given ample opportunity to practice concepts introduced, through exercises covering a wide variety of analytical applications; enabling attendees to get a very good understanding of how they might implement these processes in their own laboratories.

Who should attend?

The target audience is Chemical and Biological Testing Laboratory Personnel with interest in quantitative analytical measurements. No prior knowledge regarding the estimation or calculation of uncertainties is assumed, although some experience with basic statistics will be an advantage.

Course Duration

5 Days

Evaluation

Daily tests and the passing of a final examination, as well as the completion of an Assignment, are required in order to successfully complete this course.

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

February 2018