HSA-SAC Joint Training Courses 2020

Basic Statistical Tools

21 Apr 2020 (9.00 AM – 5.00 PM)
Course fees per pax : $267.50 (inclusive of GST)

Method Validation for Chemical Testing

28 May 2020 (9.00 AM – 5.00 PM)
Course fees per pax : $267.50 (inclusive of GST)

Measurement Uncertainty for Chemical Testing

23 Jun 2020 (9.00 AM – 5.00 PM) &
24 Jun 2020 (9.00 AM – 1.00 PM)
Course fees per pax : $406.60 (inclusive of GST)

Venue:
Recreation Room, Level 1
Health Sciences Authority
11 Outram Road
Singapore 169078
(2 minutes walk from Outram MRT station)

Register at
http://go.gov.sg/hsa-sac-courses2020
or scan to register

go.gov.sg/hsa-sac-courses2020

Jointly organised by:

HSA Health Sciences Authority

Singapore Accreditation Council

Module 1: Basic Statistical Tools

Objectives
This module is designed to give a comprehensive introduction to fundamental concepts in statistics and basic tools used for data analysis in chemical and environmental testing. It provides the foundation for the modules on method validation and measurement uncertainty in chemical testing.

Syllabus
- Descriptive statistics
- Probability distribution
- Outlier's test – *Dixon's Q test and Grubbs' test*
- Significance testing – *F*-test and Student's *t*-test
- One-way analysis of variance (ANOVA)
- Linear regression
- Worked examples and exercises

Who Should Attend
Technical staff of laboratories, managers and others who are interested in understanding or need a refresher on basic statistical tools used for data analysis in chemical and environmental testing. This module is a pre-requisite for participants who wish to attend Modules 2 and 3 but have previously not attended any of these training courses.

Module 2: Method Validation for Chemical Testing

Objectives
This module enables the participants to know the parameters studied in a method validation, to select and apply the required statistical tools and to link the topic to estimation of measurement uncertainty. Worked exercises and practice questions in the form of spreadsheets will be provided to reinforce concepts and to enable the participants to apply what they have learnt to their work.

Syllabus
- Fundamental principles of analytical method validation
- Building a validation protocol
- Performance parameters:
  - Selectivity/specificity
  - Precision
  - Bias
  - Linearity and working range
  - Limit of detection
  - Limit of quantification
  - Robustness
  - Ruggedness
- Using validation data to estimate measurement uncertainty
- Verification of standard methods
- Documentation and report
- Worked examples and exercises

Who Should Attend
Technical staff of laboratories, managers and others, who are interested to learn how method validation is carried out and data are analysed, or needs to perform method validation in their laboratories.

Module 3: Measurement Uncertainty for Chemical Testing

Objectives

This module enables the participants to understand the methods of both the "top-down" and "bottom-up" approaches to estimating measurement uncertainty. Worked exercises and practice questions in the form of spreadsheets will be provided to reinforce concepts and to enable the participants to apply what they have learnt to their work.

Syllabus

- Measurement uncertainty and reasons for estimating measurement uncertainty
- Measurement errors and propagation of random errors
- Bottom-up approach to estimating uncertainty using ISO GUM measurement uncertainty principles
  - Specification of measurand
  - Identify sources of uncertainty
  - Quantify the components of uncertainty
  - Convert uncertainty data into standard uncertainties
  - Estimate combined uncertainty and expanded uncertainty
- Top-down approach to estimating uncertainty
  - Specification of measurand
  - Identify sources of uncertainty
  - Quantify precision
  - Quantify bias
  - Estimate combined uncertainty and expanded uncertainty
- Report results and uncertainty
- Decision rule and estimating uncertainty from sampling (New requirements in ISO/IEC 17025:2017)
- Worked examples and exercises

Who Should Attend

Technical staff of laboratories, managers and others, who want to gain knowledge, improve their understanding, or be able to apply the appropriate statistical tools in their estimation of measurement uncertainty.

Since 2014, HSA has been partnered with SAC to jointly organise statistics courses. The main objective of the training courses is to elevate the knowledge of basic statistical tools, method validation and measurement uncertainty among the testing laboratories. Till date, more than 300 trainees from about 70 companies/agencies/institutions have been trained. Most of the trainees whom attended the courses were from Singapore, while some were from regional countries such as Brunei, Cambodia, Indonesia, Malaysia and Maldives.

About the Trainers

Ms Cheow Pui Sze

Ms Cheow obtained her MSc (Chemistry) degree from the National University of Singapore in 2008. She is a Senior Scientist and Team Leader of the Organic Chemistry Section. Ms Cheow has over 9 years' experience in providing statistical training to analysts in local and overseas laboratories. She has also provided a number of consultancy services on statistics to testing laboratories. Ms Cheow also served as a member of a working group tasked to develop the SAC Technical Guide 4 – A Guide on Measurement Uncertainty in Medical Testing. She is involved in the method validation and estimation of measurement uncertainty in international and regional comparative studies participated by the Laboratory, and is also largely responsible for the implementation of statistical methods in the proficiency testing programmes organised by the Laboratory and certified reference materials produced by the Laboratory.

Dr Benny Tong

Dr Tong received his PhD degree from the National Technological University in 2014. He joined the Chemical Metrology Laboratory in HSA since 2015 as a Scientist with the Inorganic Chemistry Section and Statistical Support Unit. Since then, Dr Tong has been involved in new method development and validation for the Laboratory, in which the methodologies were used for providing proficiency testing programmes and external quality assessment programmes to commercial testing laboratories. Dr Tong has over 3 years' experience in providing statistical training to analysts in local and overseas laboratories. In the past years, he has been actively involved in performing method validation and estimation of measurement uncertainty, organising/participating in international and regional comparative studies participated by the Laboratory. Dr Tong is also interested in data analytics, in which data are analysed to understand underlying experimental designs.

For further information, please email us at HSA_CML@hsa.gov.sg, or call 6775 1605 ext 125