



# **Guide to Expression of Uncertainty in Measurement (ISO/IEC 98-3 2008)**

13 to 15 June 2016

Organized by

**Hong Kong Association for  
Testing, Inspection and Certification Ltd.**

Website: [www.hktic.org](http://www.hktic.org)

Email: [info@hktic.org](mailto:info@hktic.org)

Tel.: 3116 1376

Fax: 3116 1371

This three-day course provides training for estimation of measurement uncertainty to participants who work in testing laboratories.

# Objective

This three-day course focuses on the different aspects of measurement uncertainty mainly for physical measurements. It provides participants fundamental knowledge and guidelines on what is measurement uncertainty, statistics involved and how the uncertainty can be estimated under different testing conditions. On completion of the course, participants shall have adequate knowledge to build up the uncertainty model and evaluate the measurement uncertainty of the tests.

## Outline

### A. Basic statistics and application

- Population
- Different types of distributions and related standard deviation
- Experimental standard deviation of the mean
- student-t test
- confidence interval
- applications

### B. APLAC guidelines for estimation of measurement uncertainty

- Requirements of ISO/IEC 17025
- Approaches for different disciplines

### C. Measurement uncertainty based on ISO GUM

- Definitions
- Advantages
- Steps in evaluation of measurement uncertainty

### D. Sources of uncertainty

- Measurement process
- Environment
- Operator
- Equipment

### E. Step by step evaluation

- Model
- Standard uncertainty
- Sensitivity coefficient
- Combined uncertainty
- Degree of freedom, effective degree of freedom
- Expanded uncertainty

### F. Other consideration

- Higher order
- Correlation
- Monte Carlo Method

### G. Reporting measurement uncertainty and compliance against specification

- APLAC guidelines
- ILAC guidelines
- CNAS guidelines

### H. Examples and workshops on

- Calibration
- Physical and electrical measurements

## Who Should Attend

This course is designed for all laboratory staff who are actively involved in quality aspects of the laboratory, including managers, supervisors, approved signatories, authorized representatives, etc.

## Date

Monday, Tuesday and Wednesday  
13, 14 & 15 June 2016 (3 days)

## Time

9:30am to 5:00pm

## Venue

To be confirmed.

## Instructors

Ir C.K. Cheung, *BSc, MSc, DIC, MSc(Eng), MHKIE, RPE*  
*Previously Senior Engineer in CEDD and Senior Accreditation Officer in HKAS*  
*HKICA Registered Lead Auditor*  
*HKAS Assessor*  
*PAC Lead Evaluator*

## No. of Participants

14 persons on a first-come-first-served basis (Priority will be given to members.)

## Language

Chinese (with English course material)

## Registration

1. Complete the registration form
2. Prepare a crossed cheque payable to "Hong Kong Association for Testing, Inspection and Certification Ltd." for the fee .
3. Send the completed registration form and signed cheque to the following address:

Hong Kong Association for Testing,  
Inspection and Certification Ltd.  
HKTIC Secretariat, D1105, 11/F, Jubilee  
College, 81 Chung Hau Street, Homantin,  
Kowloon

## Fee

HK\$ 4,500 for HKTIC members  
HK\$ 4,950 for non-members

This fee covers course notes, handouts, and daily light refreshments. (Fees will be refunded for unsuccessful registration or course cancellation).

## Deadline

Friday, 3 June 2016

## Assessment

There will be an assessment in the form of a written examination at the end of each module. Those that pass the exam will receive a 'Certificate of Achievement' from HKTIC. Others will receive a 'Certificate of Completion'.

## Enquiry

Email: [swn.ho@snaconsultancy.com](mailto:swn.ho@snaconsultancy.com)  
Tel.: 9150 7740  
Fax: 3905 5850

HKTIC Organized

**Guide to Expression of Measurement Uncertainty (ISO/IEC 98-3 2008) Course**

Registration Form

Participants: Suitable for Managers, Supervisors, Approved Signatories,  
Authorized Representatives, Auditors

Course Content: Please see the attached outline

Date: Monday, Tuesday and Wednesday, 13, 14 & 15 June 2016

Time: 9:30am – 5:00pm

Venue: To be confirmed

No. of Participants: 14 persons per module on a first-come-first-served basis  
(Priority will be given to HKTIC member).

---

Participant: Dr./Ir./Mr./Mrs./Ms./Miss \_\_\_\_\_  
(Name to be shown on the certificate) (Full name in block letters, surname first)

Title: \_\_\_\_\_

Organization: \_\_\_\_\_

Membership:  HKTIC member  Non-member (Please tick as appropriate)

Address: \_\_\_\_\_  
\_\_\_\_\_

Contact No.: \_\_\_\_\_  
Telephone Fax e-mail

Email: \_\_\_\_\_

Sum (HK\$): \_\_\_\_\_

Payment: \_\_\_\_\_  
Cheque No. Amount Bank

Receipt Recipient:  Not Required  Organization  Participant  
(Please tick one)

Please send a signed crossed cheque payable to "Hong Kong Association for Testing, Inspection and Certification Ltd." for the fee and the completed registration form(s) on or before 3 June 2016 to the following address:

Hong Kong Association for Testing, Inspection and Certification Ltd.  
D1105, 11/F, Jubilee College, 81 Chung Hau Street, Homantin, Kowloon  
Email: [info@hktic.org](mailto:info@hktic.org); Tel.: 3116 1376 ; Fax: 3116 1371