

HRODC Training Institute



152

Introduction to Uncertainty in Measurement: Based on the ISO Guide to the Expression of Uncertainty in Measurement (GUM)

Course or Seminar

Leading to

DIPLOMA - POSTGRADUATE IN Introduction to Uncertainty in Measurement (Double Credit)

Progressing to a Masters Degree

MBA – MSc – MA

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Prof. Dr. R. B. Crawford - Director HRODC Postgraduate Training Institute
PhD (London), MEd.M. (Bath), Adv. Dip. Ed. (Bristol), PGCIS (TVU), ITC (UWI), MAAM, MAOM, LESAN, MISGS. Visiting Prof. P.U.P.

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HRODC Postgraduate Training Institute - UKRLP Registration

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<http://www.wmld.org> and other Govt. Training and Learning Directories. It offers Full-Time, On-Line & Intensive Postgraduate Courses

For Whom This Course is Designed:

This Introduction to Uncertainty in Measurement: Based on the ISO Guide to the Expression of Uncertainty in Measurement (GUM) Seminar or Course is designed for:

- ✓ Metrologist
- ✓ Senior Calibration Technicians
- ✓ Staff in calibration and testing laboratories
- ✓ Measurement Engineers
- ✓ Quality and Design Engineers
- ✓ Laboratory and Technical Personnel
- ✓ Assessors of quality systems
- ✓ Quality and Technical Managers
- ✓ Measurement system designers and specifiers
- ✓ Machinists
- ✓ Toolmakers
- ✓ Senior Inspectors
- ✓ Statisticians
- ✓ Mechanical engineers at all levels
- ✓ Professional or experienced technical staff who are required to undertake measurement uncertainty estimation or who are required to oversight this work
- ✓ Senior staff in accredited laboratories that need to understand uncertainty estimation in order to conform to ISO 17025
- ✓ Anyone with the responsibility of establishing measurement procedures and analyzing the implications of various measurement methods and techniques for achieving precision measurements

COURSE CO-ORDINATOR:

Prof. Dr. R. B. Crawford

- ✚ PhD (London),
- ✚ MEd. M. (Bath),
- ✚ Adv. Dip. Ed. (Bristol),
- ✚ PGCIS (TVU),
- ✚ ITC (UWI),
- ✚ MSCOS
- ✚ Member of the Asian Academy of Management - MAAM,
- ✚ Member of the International Society of Gesture Studies - MISGS
- ✚ Member of the Academy of Management - MAOM,
- ✚ LESAN,
- ✚ Visiting Professor Polytechnic University of the Philippines – PUP



Duration: 2 Weeks

Cost:

- ✓ **£8,000.00 + VAT (UK Government Tax) Per Delegate** for UK Delivery
- ✓ **£10,000.00 + VAT (EU Tax) Per Delegate** for non-UK European Delivery
- ✓ **£10,000.00 Per Delegate** for Non-European Delivery (**No Tax Charged**)

Cost includes:

- ✓ Continuous refreshments,
- ✓ Hot Lunch,
- ✓ Stationery,
- ✓ Course Guide and Supplement,
- ✓ HRODC Diploma – Postgraduate - or
- ✓ HRODC Certificate of Attendance and Participation

Location: HRODC Training Centre - Central London – UK and International Locations

Seminar runs from: 9:30 a.m. to 4:30 p.m.

Dates: Schedule attached or at:

Schedule - Part 1:

http://www.hrodc.com/HRODC_Seminar_Schedule_06-07.International_Seminar_Schedule_UK_Seminars.htm

Schedule - Part 2:

http://www.hrodc.com/London_Postgraduate_Courses_Postgraduate_Diploma_Postgraduate_Executive_MBA_Schedule_MBA_Diploma_London_UK.htm

Schedule - Part 3:

http://hrodc.com/Postgraduate_Training_Institute_HRODC_Download_Folder/HRODC_Course-Sem_Schedule_2012-2013_Part_3.pdf

Click to book this course: <http://www.hrodc.com/Course%20Booking%20Form.htm>



Course Programme for Introduction to Uncertainty in Measurement: Based on the ISO Guide to the Expression of Uncertainty in Measurement Leading to Diploma-Postgraduate in Uncertainty in Measurement

- ❖ The Importance of Uncertainty in Science and Technology
- ❖ Measurement Fundamentals
 - ✓ The System of Units of Measurement
 - ✓ Scientific and Engineering Notations
 - ✓ Rounding and Significant Figures
 - ✓ Another Way of Expressing Proportional Uncertainty
- ❖ Measurement and Other Related Terms
- ❖ Introduction to Uncertainty in Measurement
 - ✓ Measurement and Error
 - ✓ Uncertainty and the Dispersion of Values
 - ✓ Standard Deviation as a Basic Measure of Uncertainty
 - ✓ The Uncertainty in the Estimate of Uncertainty
 - ✓ Combining Standard Uncertainties
- ❖ Some Statistical Concepts
 - ✓ Sampling from A Population
 - ✓ The Least-Squares Model and Least-Squares Fitting
 - ✓ Covariance and Correlation
- ❖ Systematic Errors
 - ✓ Systematic Error Revealed by Specific Information
 - ✓ Systematic Error Revealed by Changed Conditions
- ❖ Calculation of Uncertainties
 - ✓ The Measurand Model and Propagation of Uncertainties from Inputs to Measurand
 - ✓ Correlated Inputs
- ❖ Probability Density, the Gaussian Distribution and Central Limit Theorem
 - ✓ Distribution of Scores When Tossing Coins or Dice



- ✓ General Properties of Probability Density
- ✓ The Uniform or Rectangular Distribution
- ✓ The Gaussian Distribution
- ✓ Experimentally Observed Non-Gaussian Distributions
- ✓ The Central Limit Theorem
- ❖ Sampling a Gaussian Distribution
 - ✓ Sampling the Distribution of the Mean of a Sample of Size N , From a Gaussian Population
 - ✓ Sampling the Distribution of the Variance of a Sample of Size N , From a Gaussian Population
 - ✓ Sampling the Distribution of the Standard Deviation of a Sample of Size N , From a Gaussian Population
- ❖ The T -Distribution and Welch–Satterthwaite Formula
 - ✓ The Coverage Interval for a Gaussian Distribution
 - ✓ The Coverage Interval Using a T -Distribution
 - ✓ The Welch–Satterthwaite Formula

Modes of Study for Postgraduate Diploma Courses

There are three delivery formats for Postgraduate Diploma Courses, as follows:

1. Intensive Full-time Mode (3 months)
2. Full-time Mode (6 month)
3. Video-Enhanced On-Line Mode

Whichever study mode is selected, the aggregate of 360 hours direct lecturer contact must be achieved.



Cumulative Postgraduate Diploma Courses

All short courses can accumulate to the required number of hours, for the Postgraduate Diploma, over a six-year period from the first registration. In this regard, it is important to note that short courses vary in length, the minimum being 5 days (Diploma – Postgraduate) – equivalent to 30 hours. A six-day course (Diploma – Postgraduate) is, therefore, equivalent to 36 hours direct lecturer contact. For those delegates choosing the accumulative route, it is advisable that at least two courses per year be taken. Twelve short courses or the equivalent of 360 hours of lectures are, therefore, required for the Award of Postgraduate Diploma. This type of Postgraduate Diploma might include both General and Specialist groupings.

Progression to Postgraduate Degree – MA, MBA, MSc

1. On the successful completion of the *Postgraduate Diploma*, delegates may register for the Masters Degree;
2. The Delegates' Degree Registration Category will be dictated by the courses or modules studied at Postgraduate Diploma Level. The categories relate to Master of Business Administration (MBA); Master of Arts (MA) Master of Science (MSc); Executive Master of Business Administration (Executive MBA).
3. Delegates' progression to the Masters Degree Dissertation will be confirmed on their successful completion of Course #7: *Research Project: Design, Conduct & Report*;

Course Admission and Registration:

As an Award-bearing Postgraduate Course, it is essential that we assess the aptitude of our potential participants. We, would, therefore appreciate if you might complete our standard Postgraduate Application Form, which is available on request (please see our contact details above), or downloadable from:

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http://www.hrodc.com/Brochure_Download_Centre.Company_Brochures_Seminar_Brochures_Seminar_Schedule.htm

If your previous qualifications and experience are in line with our admission criteria, you will be sent an official notification of your admission to the course or courses for which you have applied, along with a Performa invoice, for the payment of the relevant fees. You will then be duly registered for the course/s as soon as we have received your payment.

Terms and Conditions

HRODC Policy Terms and Conditions are Available for viewing at:

<http://www.hrodc.com/COSTS.htm>

Or Downloaded, at:

http://www.hrodc.com/Brochure_Download_Centre.Company_Brochures_Seminar_Brochures_Seminar_Schedule.htm

The submission of our application form or otherwise registration is an attestation of the candidate's subscription to our Policy Terms and Conditions, which are legally binding.

Professor Dr. R. B. Crawford – Director HRODC Training Institute.

