

COURSE OVERVIEW LE0490
Uncertainty of Measurement & Method
Validation in Accordance with ISO 17025

Course Title

Uncertainty of Measurement & Method Validation in Accordance with ISO 17025

Course Date/Venue

Session 1: April 13-17, 2025/Meeting Plus 9, City Centre Rotana, Doha, Qatar

Session 2: September 07-11, 2025/Meeting Plus 9, City Centre Rotana, Doha, Qatar

Course Reference

LE0490

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

Statistical tools play an important role in GLP to calculate the Uncertainty Measurement. This course will focus on the latest techniques and standards developed to measure the uncertainty of the data. The Guideline for Uncertainty Measurement (GUM) will be introduced in a simple way. Every effort is made in this course to eliminate unnecessary complications, to apply the GUM at its simplest level and to take away apparent mystery.



Participants who have never drawn up uncertainty budgets before usually develop the required skill well before the end of the course. Others who seek explanations of GUM complexities obtain clarifications expressed in simple terms. Measurement uncertainty problems are solved by brainstorming methods so as to generate interaction by all participants.



The course will use the Statistical Process Control (SPC) module as a tool to validate the uncertainty measurement. It covers control charts and their applicability to uncertainty before covering a step-by-step process of calculating uncertainty for a typical application. Methods of reporting uncertainty, the uncertainty budget and applicable standards and guidelines for expressing measurement uncertainty are covered in some detail. Successful completion of this course will enable participants to understand, evaluate and express measurement uncertainty.



Laboratories have a professional obligation to provide accurate and reliable analytical results to customers. The Laboratory should justify the customer's trust by providing the correct answer to the analytical part of the problem, in other words, results that have demonstrable 'fitness for purpose'. Analytical method validation is one of the measure universally recognized by laboratory as a necessity for a comprehensive system of quality assurance.

Method validation is the process that provides evidence that a given analytical method, when correctly applied, produces results that are fit for purpose. No matter how well a method performs elsewhere, analysts need to confirm that the method is valid when applied in their laboratory. There is now a much greater emphasis on method validation in the ISO/IEC 17025 accreditation standard. Through a number of workshops within this course, delegates build a validation protocol for a method of their choice.

The ability to estimate measurement uncertainty is now a requirement of testing laboratories accredited to ISO/IEC 17025. This course is in line with ISO principles and with the EURACHEM/CITAC guide. 'Quantifying Uncertainty in Analytical Measurement'. The course will introduce the principles of evaluating uncertainty and the tools for identifying uncertainties and using validation data. The course will take participants through the process of evaluating uncertainty. Completion of this course should provide sufficient training to enable analysts to carry out an uncertainty evaluation for their own laboratory methods.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply systematic techniques in uncertainty of measurement and method validation in accordance with ISO 17025
- Discuss the principles of uncertainty of measurement
- Differentiate between errors and uncertainties as well as measures of central tendency and measures of the spread of measurements
- Describe the various types of hypothesis testing and the concept of ANOVA
- Explain basic principles of correlation and regression
- Draw up an uncertainty budget
- Explain the process of method validation and documentation in accordance with ISO 17025
- Set validation criteria that will satisfy the needs of customers
- Recognize the method of validation by considering the proof of the performance of a method and/or assuring the quality of a measurement according to ISO 17025
- Perform maintenance of validation by means of analysis of QC samples & CRMs, reproducibility studies and customer management
- Demonstrate the process of writing a method validation document by presenting some case studies and practical exercises to enhance knowledge and understanding of the subject

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive "Haward Smart Training Kit" (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.





Who Should Attend

This course provides an overview of all significant aspects and considerations of uncertainty of measurement and method validation in accordance with ISO 17025 for laboratory managers of test laboratories, scientists doing measurements in test laboratories, chemists and other technical staff.

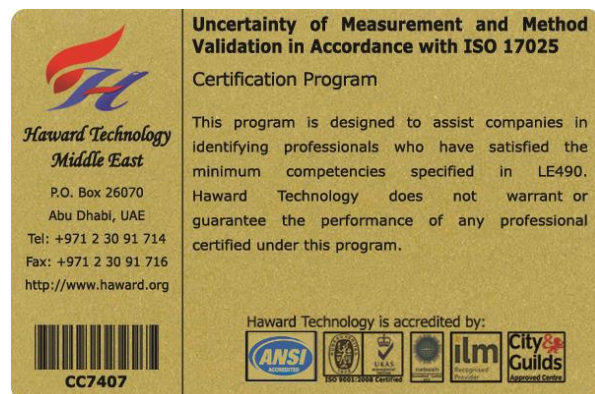
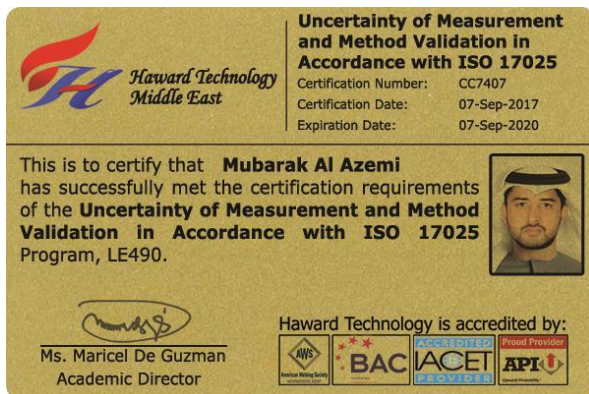
Course Certificate(s)

(1) Internationally recognized Competency Certificates and Plastic Wallet Cards will be issued to participants who completed a minimum of 80% of the total tuition hours and successfully passed the exam at the end of the course. Certificates are valid for 5 years.

Recertification is FOC for a Lifetime.

Sample of Certificates

The following are samples of the certificates that will be awarded to course participants: -





- (2) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

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Haward Technology Middle East
Continuing Professional Development (HTME-CPD)

CEU Official Transcript of Records

TOR Issuance Date: 07-Sep-17
HTME No. PAR21902
Participant Name: Mubarak Al Azemi

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
LE490	Uncertainty of Measurement and Method Validation in Accordance with ISO 17025	September 03-07, 2017	30	3.0

Total No. of CEU's Earned as of TOR Issuance Date **3.0**

TRUE COPY

 Maricel De Guzman
 Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 Standard.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking Continuing Education Units (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology is accredited by


P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | Fax: +971 2 3091 716 | E-mail: info@haward.org | Website: www.haward.org





Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:-

- 
British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

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The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

Haward Technology’s courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant’s involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant’s CEU and PDH Transcript of Records upon request.

Course Fee

US\$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.





Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Dr. Tarek Awad, PhD, MSc, PGDip, BSc, is a **Senior Analytical Chemist** with over **25 years** of experience within the **Oil, Gas, Refinery & Petrochemical** industries. His experience widely covers in the areas of **Mercury Removal & Analysis** Techniques, **Mercury (Hg) Analyzer**, **Mercury Vapor Analyzers**, **Natural Gas & LNG**, **Analytical Laboratory Management**, **Gas Chromatography (GC)**, **Laboratory Quality Management**, **Lab Management** Systems, **Product & Chemical Analysis**, **QA/QC**, **Analytical Management Activities/Techniques**, **Crude Oil Testing & Equipment**, **IP/ASTM Test Methods**, **Crude Oil Sample Analysis**, Analysis of **Water Quality Specification**, **Water Sampling** Techniques, **Water Analysis & Quality Control**, **Laboratory Environmental Analysis** (Soil, Water, Air), **Health & Safety** and **Laboratory Operations**. Further, he is well-versed in **Six Sigma** Analysis, **Six Sigma** Technology, **Tool Landscape**, **Lean Six Sigma**, **DMAIC**, **Statistical Process Control**, **Measurement System Analysis**, **Business Analysis**, **Corporate Strategies**, **Budget Preparations & Follow-Up**, **Capital & Resources Planning & Management**, **Planning Claims Management**, **Quality Assurance & Control**, **Total Quality Management**, **Project Management**, **Quality Management System**, **Analytical Problem-Solving & Decision Making** and **Communication & Leadership** Skills. He is a **Certified Data Analyst**, **Lean Six Sigma Black Belt (LSSBB)**, and **Certified Lead Auditor** in accordance with **ISO 9001**, **ISO14001**, **OHSAS 18001** and **ISO 17025**.

Dr. Tarek gained his expertise through his long-term dedication as a **Senior Laboratory Analyst** in **SEGAS LNG**. He was in-charge of plant optimization, Quality, Environmental & OHSAS Standards. Prior to this, he was the **Laboratory Manager**, an **Advisor** for a reputable oil, gas and LNG company in the Middle East and was the **Senior Corrosion & QC Chemist** of **WEPCO** wherein his duties involved quality control, corrosion control and chemical optimization for oilfield. He has built-up a formidable reputation with his professionalism and practical problem-solving abilities and has performed significant contribution to his fields.

Dr. Tarek has **PhD** in **Analytical Chemistry**, a **Post Graduate Diploma** and **Master's** degree in **Material Science (Corrosion)** and **Bachelor's** degree in **Chemistry**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)**, a **Certified CLSSBB Lean Six Sigma**, a **Certified ISO Auditor/Lead Auditor (QMS)**, a **Certified IEMA Auditor (EMS)** and an active member of **International Register of Certificated Auditors (IRCA)**, **American Center Library**, **Egyptian Accreditation Council (EGAC)**, **Technical Assistance Center (TAC)**, **Egyptian Corrosion Society**, **Egyptian Arab Society of Material Science**, **Egyptian Syndicate of Scientific Profession** and **Egyptian Petroleum Association**. He has further published various scientific papers, technical journals as well as delivered numerous trainings, courses, seminars and workshops worldwide.



Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course director(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 - 0800	Registration & Coffee
0800 - 0815	Welcome & Introduction
0815 - 0830	PRE-TEST
0830 - 0930	Basic Principles The Difference Between Errors and Uncertainties • Measures of Central Tendency Like the Mean
0930 - 0945	Break
0945 - 1100	Basic Principles (cont'd) Measures of the Spread of Measurements like the Standard Deviation, Variance, RSD • Populations and Samples
1100 - 1200	Basic Principles (cont'd) Confidence Limits and Confidence Intervals • Hypothesis Testing
1200 - 1215	Break
1215 - 1420	Basic Principles (cont'd) Analysis of Variance (ANOVA) • Basic Principles of Correlation and Regression
1420 - 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 - 0930	Method of Validation Customer Management According to ISO 17025
0930 - 0945	Break
0945 - 1100	Method of Validation (cont'd) Customer Management According to ISO 17025 (cont'd)
1100 - 1200	Method of Validation (cont'd) Setting Validation Criteria that will Satisfy the Needs of Customers
1200 - 1215	Break
1215 - 1420	Method of Validation (cont'd) Setting Validation Criteria that will Satisfy the Needs of Customers (cont'd)
1420 - 1430	Recap
1430	Lunch & End of Day Two



Day 3

0730 - 0830	Method of Validation (cont'd) <i>The Validation Proper. To Prove the Method Can Achieve What was Promised to Customers.</i>
0930 - 0945	Break
0945 - 1100	Method of Validation (cont'd) <i>The Validation Proper. To Prove the Method Can Achieve What was Promised to Customers. (cont'd)</i>
1100 - 1200	Method of Validation (cont'd) <i>The Validation Proper. To Prove the Method Can Achieve What was Promised to Customers. (cont'd)</i>
1200 - 1215	Break
1215 - 1420	Method of Validation (cont'd) <i>The Validation Proper. To Prove the Method Can Achieve What was Promised to Customers. (cont'd)</i>
1420 - 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730- 0930	Method of Validation (cont'd) <i>Proof of the Performance of a Method and/or Assuring the Quality of a Measurement According to ISO 17025</i>
0930 - 0945	Break
0945 - 1100	Method of Validation (cont'd) <i>Maintenance of Validation by Means of: Analysis of QC samples; Analysis of CRM's</i>
1100 - 1200	Method of Validation (cont'd) <i>Maintenance of Validation by Means of: Analysis of QC samples; Analysis of CRM's (cont'd)</i>
1200 - 1215	Break
1215 - 1420	Method of Validation (cont'd) <i>Maintenance of Validation by Means of: Reproducibility Studies like Proficiency Testing and Interlaboratory Studies; Customer Management</i>
1420 - 1430	Recap
1430	Lunch & End of Day Four

Day 5

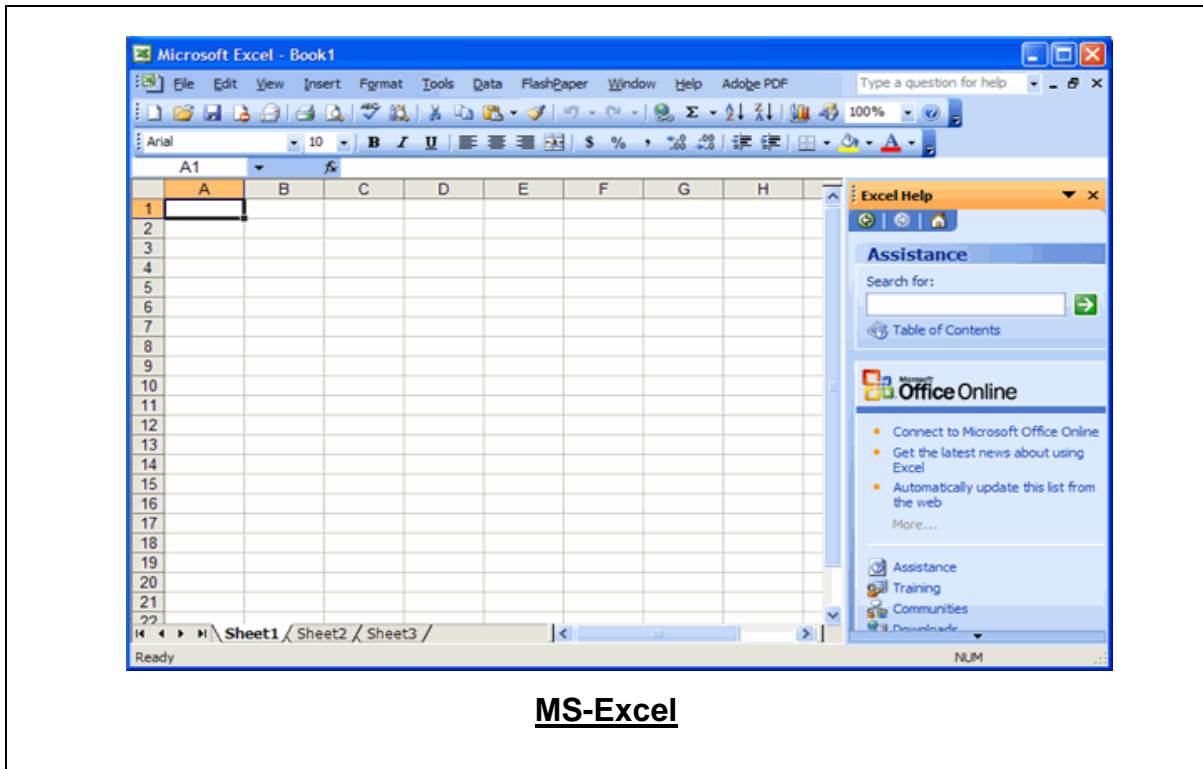
0730 - 0930	Case Study <i>How to Write a Method Validation Document. Students will Work in Groups or Individually to Solve a Case Study</i>
0930 - 0945	Break
0945 - 1100	Case Study (cont'd) <i>How to Write a Method Validation Document. Students will Work in Groups or Individually to Solve a Case Study (cont'd)</i>
1100 - 1200	Case Study (cont'd) <i>How to Write a Method Validation Document. Students will Work in Groups or Individually to Solve a Case Study (cont'd)</i>

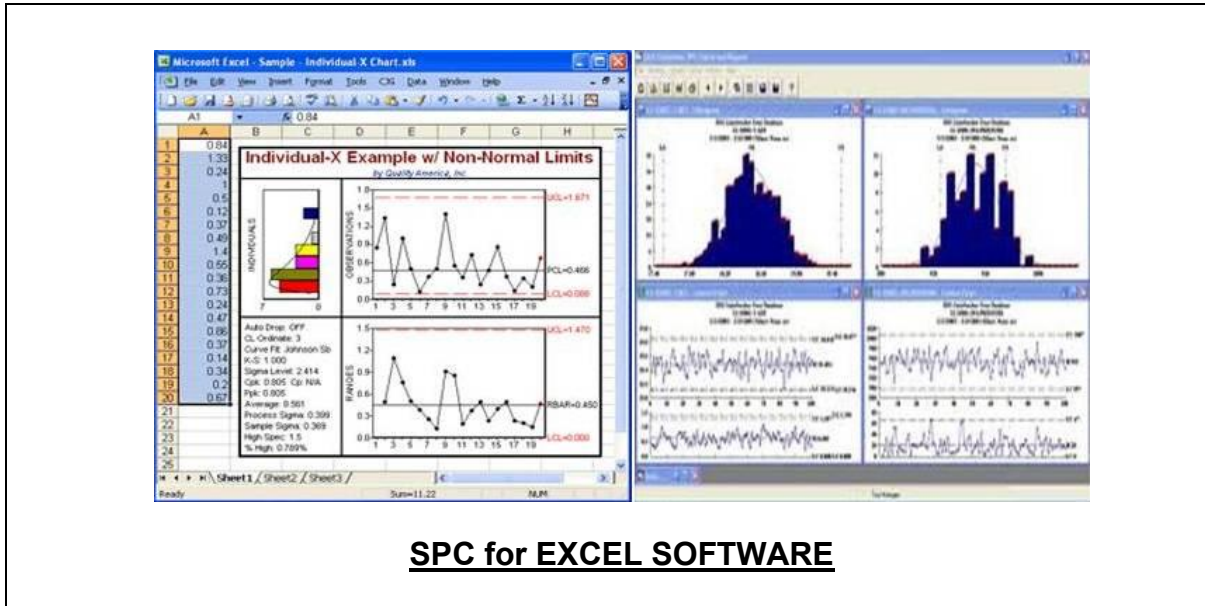


1200 – 1215	Break
1215 – 1300	Case Study (cont'd) <i>How to Write a Method Validation Document. Students will Work in Groups or Individually to Solve a Case Study (cont'd)</i>
1300 – 1315	Course Conclusion
1315 – 1415	COMPETENCY EXAM
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators “MS-Excel” and “SPC for Excel Software”.





SPC for EXCEL SOFTWARE

Course Coordinator

Reem Dergham, Tel: +974 4423 1327, Email: reem@haward.org

