



COURSE OVERVIEW LE0200-4D Process Analyzer Technology

Course Title

Process Analyzer Technology

Course Date/Venue

December 09-12, 2024/Fujairah Meeting Room,
Grand Millennium Al Wahda Hotel, Abu Dhabi,
UAE

Courser Reference

LE0200-4D

Course Duration/Credits

Four days/2.4 CEUs/24 PDHs



Course Description



This practical, highly-interactive course includes practical sessions and exercises where participants will visit the laboratory and they will be introduced to various lab instruments and process analyzers. Practical sessions will be performed using one instrument in order to apply the theory learnt in the class.



The analysis of process liquids and gases in today's oil, gas and chemicals industries requires accurate knowledge of composition and make up of process fluids. This in turn means accurate measurement of those compositions. Without measurement there can be no control and no information as to the state of the process. Similarly, we have no way of knowing if we are causing environmental damage without this type of monitoring.



With the advancement in computer applications and electronics, analyzers have gained popularity in recent years. They have taken the spot sampling capability of a laboratory and converted into a continuous sampling system. With continuous sampling, the process variable is being analyzed on a continuous basis with a much faster update time. Faster update time has given the analyzer the ability to be used for control purposes.

This course is designed to cover the purpose of analyzer systems, how they are selected and their installation and maintenance. Course participants will learn how a sample is conditioned so the analyzer will give a representative reading of the component that is of interest in the process.

The course describes the major types of process analyzers and the principles behind the selection, construction and operation of each analyzer. It covers multiple measurement techniques ranging from physical, thermal, electrical, and optical techniques through those utilized in electrochemistry, chromatography and spectroscopy. It also touches on maintenance, system packaging and system errors consideration.

Course Objectives

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

- Apply and gain an in-depth knowledge on process analyzer technology
- Explain mechanical measurement considerations and identify the various types of flowmeters, sensors, viscometers and densitometers
- Demonstrate knowledge on the application and selection of level and viscosity measurement
- Evaluate concepts on chemical analysis such as spectroscopy, LEL & NMR, oxygen analyzers, electrochemical analyzers, gas chromatography, gas analyzers and moisture analyzers
- Identify and discuss concepts related to instrumentation systems including sampling systems, process samples, stack particulates and analyzer safety

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, sample video clips of the instructor’s actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.

Who Should Attend

This course is intended for those working on process plants and plant laboratories who are seeking knowledge and skills in analytical measuring instruments and process analyzers. This includes instrumentation engineers, measuring engineers, UD engineers, supervisors, online instrument analyzer personnel, analytical instrument personnel and other technical staff on all types of oil, gas, refineries, petrochemical and other process plants. The course will also benefit the laboratory personnel who work closely with plant personnel and therefore should have an understanding of the types of process instruments used and any associated limitations.

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 Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations


Certificates are accredited by the following international accreditation organizations: -

- 
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 **2.4 CEUs** (Continuing Education Units) or **24 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.

- 
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.

Course Fee

US\$ 4,500 per Delegate + **VAT**. 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:



Mr. Dirk Horst (Dirk Matthias Horst) is a **Senior Instrumentation & Analyzer Engineer** with over **45 years** of extensive experience within the **Oil & Gas, Refinery and Petroleum** industries. His wide experience covers in the areas of **Analytical Instrumentation** for Laboratory, **Process Analyzer & Sampling Systems, Gas Chromatograph Analyzer Operation & Maintenance, Process Analyzer Technology, Process Analyzer Sampling System, Custody Transfer/Fiscal Metering, Industrial Sampling Systems Engineering, Process Analyser Systems & Instrumentation, Process Control & Instrumentation, Process Controller Tuning, Custody Transfer Metering, Process Gas Chromatography, Basic Instrumentation & Process Control, On-and Off-line Gas Chromatography, Sulphur & Vapour Pressure Analysis, Controller Tuning & Valves, Process Measurement, Process Analyzer Systems, Fiscal Measurement & Loss Control, Maintenance Water Treatment Analyzer, pH Analysis & Water Conductivity, Effective Management of the Chemical Analysis Support; Quality Assurance in a Laboratory; Practical Statistical Analysis of Lab Data, Analytical Laboratory Quality Management System, On & Off-Line Gas Chromatography, Natural Gas Determination, Quality Measuring Instruments, Crude Metering System, Analytical Instrumentation, Process Control & Instrumentation, Process Troubleshooting, Measuring Instruments, Calibrating Instruments, LNG Custody Transfer Analysis, Quality Assurance Monitoring System and In-Line Gasoline Blending System.**

Mr. Horst has performed significant contributions in various industries for handling challenging positions such as the **Senior Assistant Chemist, Process Analyzer Engineer, Quality Measurement Instrumentation (QMI) Maintenance Engineer, Instrument Engineer, Analyzer System Maintenance Supervisor, Senior Quality Measurement Instruments Assistant, Team Leader, Instrument Trainer Assessor & Internal Verifier, Senior Instructor/Trainer, Instrumentation & Analyzer Trainer, QMI Advisor/Consultant and Instrument Technician** for different international companies including **Shell Refinery, Shell Global Solutions, SIOP-Shell, Yokogawa LNG, QMI, Harburg Refinery, Nigeria LNG, Sakhalin LNG, SRTCA, Reliance Petroleum Refinery** and many more.

Mr. Horst has a **Bachelor's degree in Combined Sciences** from the **University of Leicester, UK**. Further, he is a **Certified Instructor/Trainer, a Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management (ILM)** has delivered numerous trainings, courses, workshops, conferences and seminars internationally.





Course Program

The following program is planned for this course. However, the course instructor(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: Monday, 09th of December 2024

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction & General Considerations Industrial Analytical Chemistry • Practical Aspects of Process Analytical Chemistry • Process Control & Analytical Instrumentation • Principles of Online and Offline Process Analyzer Concept • Measurement Accuracy • Maintenance
0930 – 0945	Break
0945 – 1115	Mechanical Measurements Flow Meters • Laminar, Magnetic and Ultrasonic Flowmeters • Level Measurement - Application and Selection • Radio Frequency, Laser, Radar and Ultrasonic Level Sensors • Temperature Measurement • Radiation and Infrared Pyrometers, Resistance Temperature Detectors and Ultrasonic Thermometers • Viscosity Measurement -.Application and Selection
1115 – 1245	Mechanical Measurements (cont'd) Industrial Viscometers • Laboratory Viscometers • Density Measurement • Oscillating Coriolis Densitometers • Radiation Densitometers • Vibrating Densitometers • Gas Densitometers
1245 – 1300	Break
1300 – 1420	Chemical Analysis: Introduction
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2: Tuesday, 10th of December 2024

0730 – 0900	Chemical Analysis: Spectroscopy UV (Ultraviolet), IR (Infrared) & NIR (Near Infrared)
0900 – 0915	Break
0915 – 1045	Chemical Analysis: Spectroscopy (cont'd) Raman Spectroscopy • TDL (Tunable Diode Lasers)
1045 – 1230	Chemical Analysis: LEL & NMR LEL (Lower Explosion Limit) • NMR (Nuclear Magnetic Resonance)
1230 – 1245	Break
1245 – 1420	Chemical Analysis: Oxygen Analyzers Introduction • Electrochemical Oxygen Analyzer • Paramagnetic Oxygen Analyzer • Zirconia Oxygen Analyzer
1420 – 1430	Recap
1430	Lunch & End of Day Two

Day 3: Wednesday, 11th of December 2024

0730 – 0900	Chemical Analysis: Electrochemical Analyzers Introduction • PH Analyzers • Contacting Conductivity Analyzers • Toroidal Conductivity Analyzers • Ion Selective Electrodes • Other Electrochemical Techniques
0900 – 0915	Break





0915 – 1045	Chemical Analysis: Gas Chromatography Process GC Theory • GC Columns
1045 – 1230	Chemical Analysis: Gas Analyzers GC Detectors • Column Switching and Backflushing • Interactive Audio Visual on Process GC • FID Gas Analyzers • Laser Gas Analyzers
1230 – 1245	Break
1245 – 1420	Chemical Analysis: Gas Analyzers (cont'd) TCD Gas Analyzers • Other Similar Types • FT-IR Mass Spectrometer Gas Analyzer • Air Quality Monitoring
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4: Thursday, 12th of December 2024

0730 – 0900	Chemical Analysis: Moisture Analyzers Moisture Measurement • Capacitance Based Analyzers • Wet and Dry Bulb Hygrometer Based Analyzers • Hair Hygrometer Based Analyzers • Dew Point Hygrometer Based Analyzers
0900 – 0915	Break
0915 – 1045	Instrumentation Systems Sampling Systems • Process Samples • Stack Particulates • Analyzer Safety
1045 – 1230	Summary & Open Forum
1230 – 1245	Break
1245 – 1345	Evaluation of Seminar & Presentation of Certificates
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Certificates
1430	Lunch & End of Course

Practical Sessions/Site Visit

Site visit will be organized during the course for delegates to practice the theory learnt:-



Course Coordinator

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org

