COURSE OVERVIEW LE0270

High Performance Liquid Chromatography (HPLC)

Course Title
High Performance Liquid Chromatography (HPLC)

Course Date/Venue
September 08-12, 2024/Pearl Meeting Room, Cristal Amaken Hotel, Riyadh, KSA

Course Reference
LE0270

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description

This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

HPLC is used for separating, detecting and analyzing a variety of materials, including organic compounds and polymers. HPLC size-exclusion chromatography separates molecules based on differences in their molecular weights. Compounds varying in molecular weight from a few hundred to 10 million daltons can be easily separated. Three methods (laser light scattering, refractive index and UV-VIS) are used to detect the separated compounds and to characterize the components present. This technique provides valuable data on formulations for batch-to-batch comparisons.

This course covers the basics of the relevant scientific history, underlying theory and principles of operation of liquid chromatography. A description of HPLC hardware, its purpose and mode of operation, as well as basic separation principles are all covered in this course. A classroom approach with practical demonstrations and examples, together with written course notes helps to provide all the fundamental references someone starting out in HPLC needs.

This course is designed for beginners and intermediate-level users in HPLC who want practical laboratory experience. The lectures, supplemented by problems sets, slides, and video tapes, provide the fundamentals needed to understand the techniques and instrumentation involved in this powerful analytical tool. No prior experience in advanced mathematics, theoretical chemistry, or physics is required for this course. Some experience in HPLC or introductory course work in organic chemistry is desirable but not necessary.

Course Objectives

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

- Perform proper analysis using HPLC
- Describe HPLC instrumentation, detector details and hardware
- Discuss important HPLC parameters, separation fundamentals and mobile phase
- Distinguish separation modes such as reverse phase, normal phase, ion exchange and size exchange as well as carryout column selection and optimization
- Carryout quantitative and qualitative analysis
- Troubleshoot HPLC systems such as hardware, separation, etc
- Carryout gradients and develop methods from completely unknown mixtures

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 high-performance liquid chromatography (HPLC) for laboratory and R&D staff who are seeking a good working knowledge in HPLC. The lectures, supplemented by problems sets, slides, and video tapes, provide the knowledge needed to understand the techniques and instrumentation involved in this powerful analytical tool. The course is essential for chemists, scientists, researchers, instrumentation engineers and other laboratory staff.

Course Fee

US$ 7,000 per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), 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 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 **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.

- 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 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. Hesham Abdou, PhD, MSc, BSc, is a **Senior Engineer** with over **35 years** of practical experience in various industrial fields. His specialization widely covers in the areas of **High Performance Liquid Chromatography (HPLC)**, **Laboratory Quality Management & Quality Assurance**, Management, Operations, SPC & Quality **ISO 17025**, Risk Management & **ISO 17025**, Medical Laboratory Quality Management **ISO** 15189:2007, Lab Instrument Calibration & Troubleshooting Techniques, Modern **Analytical** Laboratory, Safety in **Analytical** Laboratories, **Analytical** Chemistry & Precise Results Generation, **Network** Management & Supervision, **Basics** Waste Water Treatment, Fundamentals of Water **Utility Regulation**, Operation & Maintenance of **Water Networks**, Water Meter Reading System (**MMR**), Operation & Maintenance of **Sewerage System**, **Principles** of Routine & Preventive Maintenance, **Safety Procedures** in Water Networks, **Sewer & Treated Effluent Network** System, **Sewer Network** Repair & Maintenance, **Valve Chamber** Maintenance, **Water** Analysis & Testing, **Water** Sampling Procedures, **Water System Design** & Installation, **Water Networks Design** Procedures, **Water Pumping** Process, **Equipment Handling** Procedures, **Pipes**, **Fitting & Valves**, **Pipelines**, **Pumps**, **Turbines**, **Heat Exchangers**, **Separators**, **Heaters**, **Compressors**, **Storage Tanks**, **Valves** Selection, **Compressors**, **Tank & Tank Farms** Operations & Performance, **Piping & Pumping** Operations, **Pump** Performance Monitoring, **Rotor Bearing** Modelling, **Hydraulic** Repairs & Cylinders, **Root Cause Analysis**, **Vibration & Condition** Monitoring, **Piping Stress** Analysis, **Gas Conditioning & Processing**, **Cooling Towers** Operation & Troubleshooting, **PCP & Jet Pump**, **Acid Gas** Removal, **Chemical Engineering Process** Design, **Hydrocracker Process Unit** Technology, **Hydro-Treating** Technology, **Distillation** Design, **Production Quality & Process** Troubleshooting, **Process Plant** Optimization, **Rehabilitation**, **Revamping & Debottlenecking**, **Heat Medium Fired Heater** Troubleshooting & Maintenance, **Hydro-Treating** Technology, **Process Plant** Performance & Efficiency, **Hydro Treating & Hydrocracker** Technology, Basics of Operation and Supervision of **Water Tanks Filling Stations**, **Amine Gas Sweetening & Sulfur Recovery**, Heat & Mass Transfer and Fluid Mechanics.

During his career life, Dr. Hesham held significant positions and dedication as the **General Manager**, **Laboratory Manager**, **Operations Manager**, **Maintenance Manager**, **Section Head**, **Quality Control Analyst**, **Process Engineer** and **Mechanical Engineer** in various companies.

Dr. Hesham has a **PhD** and **Master** degrees in **Mechanical Engineering** and a **Bachelor's** degree in **Process Engineering**. Further, he is a **Certified Instructor/Trainer** and a **Peer Reviewer**. Dr. Hesham is a member of Egyptian Engineering Syndicate. Moreover, he has published technical papers and journals and has delivered numerous trainings, workshops, courses, seminars and conferences internationally.

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 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: ***Sunday, 08th of September 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0900	***HPLC Overview***
0900 - 0930	***Introduction to HPLC***
0930 – 0945	*Break*
0945 - 1100	***Instrumentation Overview***
1100 – 1230	***Detector Details***
1230 – 1245	*Break*
1245 – 1420	***Laboratory: Basic HPLC Hardware***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Monday, 09th of September 2024***

0730 – 0830	***Separation Fundamentals & Mobile Phase***
0830 - 0930	***Practical HPLC Theory***
0930 – 0945	*Break*
0945 – 1100	***Important HPLC Parameters***
1100 – 1230	***The Mobile Phase***
1230 – 1245	*Break*
1245 – 1330	***Laboratory: Mobile Phase Strength Flow Rate & Temperature***
1330 - 1420	***Separation Modes & Columns***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: ***Tuesday, 10th of September 2024***

0730 – 0930	***Reversed Phase***
0930 – 0945	*Break*
0945 – 1100	***Normal Phase***
1100 – 1230	***Ion Exchange***

1230 – 1245	Break
1245 - 1330	***Size Exchange***
1330 – 1420	***Laboratories: pH Effects in Reversed Phase & Column Dimensions***
1420 – 1430	***Recap***
1430	Lunch & End of Day Three

Day 4: Wednesday, 11th of September 2024

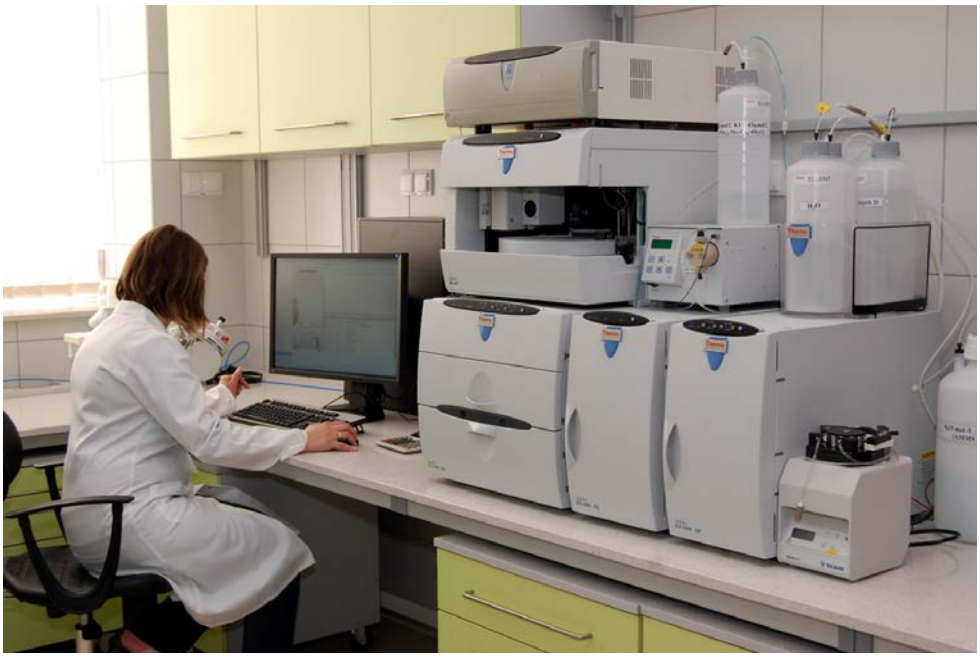
0730 – 0830	***Quantitative Analysis & Troubleshooting***
0830 - 0930	***Qualitative & Quantitative Analysis***
0930 – 0945	Break
0945 – 1100	***LC/MS***
1100 – 1230	***Hardware Troubleshooting***
1230 – 1245	Break
1245 - 1330	***Separation Troubleshooting***
1330 – 1420	***Laboratory: Internal Vs. External Standard***
1420 – 1430	***Recap***
1430	Lunch & End of Day Four

Day 5: Thursday, 12th of September 2024

0730 – 0830	***Hardware Troubleshooting***
0830 - 0930	***Gradients & Method Development***
0930 – 0945	Break
0945 – 1100	***Gradients***
1100 – 1230	***Fundamentals of Method Development***
1230 – 1245	Break
1245 – 1345	***Laboratory: Develop a Method from a Completely Unknown Mixture***
1345 - 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

Practical Sessions/Site Visit

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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