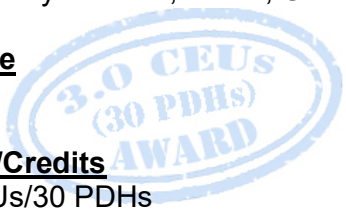
COURSE OVERVIEW ME0765
Hydraulic in Oil and Gas Pipeline

Course Title
Hydraulic in Oil and Gas Pipeline

Course Date/Venue
Session 1: June 23-27, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: December 07-11, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE



Course Reference
ME0765

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

Course Description

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

This course is designed to provide delegates with a detailed and up-to-date overview of the techniques used to provide the solution to a wide variety of problems involving the flow of oil (and other liquids) and gases through pipes.

The course will address aspects of both low-speed and high-speed pipe flows and will draw upon numerous exercises to facilitate the communication of the subject matter.

Whilst the course will involve a substantial amount of mathematics, it is intended to minimize the level required so that participants can extract the more important engineering features of the subject.

Participants will acquire the practical knowledge to enable them not only to analyze a wide range of oil and gas flow pipework problems, but also to design optimum pipe networks.

Course Objectives

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

- Apply and gain an in-depth knowledge on pipeline hydraulic engineering including liquid and gas flows in pipes, engineering calculation, analysis and practices
- Discuss the oil and gas flows and the general approach to problem solving
- Define fluid mechanics, static, dynamic and hydrostatic pressures
- Discuss one-dimensional steady flows and perform proper applications to flow measurements
- Explain steady flows of inviscid fluids, flows through pipe nozzles, sudden expansions and bends, steady flows of viscous fluids through pipes, power transmission through pipes and pipe friction
- Carryout dimensional analysis and determine compressible pipe flows

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

The course has been developed for project engineers, process engineers and plant engineers in the oil, chemical and other process industries who require the necessary skills to be able to analyze the flow of oil and gas through pipes. No prior knowledge of the topic is required and participants will be taken through all the fundamental principles of the subject of fluid mechanics using a level of mathematics which at all times is purposely kept to a minimum level. The course makes use of a very substantial number of worked examples giving the participants the necessary time and opportunity to learn from practical problem-solving.

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 Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day

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: -

- 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.

- 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.

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. Rod Larmour, PEng, MSc, BSc, is a **Senior Mechanical Engineer** with over **30 years** of **Onshore & Offshore** practical experience within the **Power**, **Petrochemical**, **Oil & Gas** industries. His expertise greatly covers the application of **Rotating Machinery**, **Mechanical Alignment**, **Stress Analysis**, **Thermodynamics**, **Fluid Mechanics**, **Heat & Mass Transfer Engineering**, **Air Conditioning & Refrigeration Technology**, Cooling Towers, **Gas & Steam Turbines**, **Centrifugal Compressor & Pumps** and the **design**, **failure investigation**, and **maintenance** of **Atmospheric Storage Tanks & Tank Farms** and **Bolted Flanges & Joints**.

Currently, Mr. Larmour is working with Transnet overseeing the performance and safety of several **fuel pipelines** including **pumping stations** and **inland tank farms** locally. He also takes lead in the **planning** of detailed design of a **fuel gas supply system** from a site to the **proposed new power station**, the **management** of an **EPC booster gas compressor station** including an **overland piping**, and **spearheads** the **commercial & contractual management** within the **Ilitha Process Group**.

Throughout Mr. Larmour's lengthy career, he has worked with **several international companies** like **Mobil**, **Mossgas**, **Stewarts & Lloyds** and **Ilitha** with prime positions such as **Operations Manager**, **Principal Project Manager**, **Senior Mechanical Engineer**, **Offshore Projects Manager**, **Design Manager**, **Quality Assurance Manager** and **Project Engineer**.

Mr. Larmour's experience was not only confined to the industry alone. He was also able to largely contribute his expertise and impart his knowledge in the academe. He has engaged himself with **researches** and **lectures** in for several **universities** and **companies** and has held numerous **training courses** on **Thermomechanics** & **Fluid mechanics**, **Engineering Design**, **Refrigeration & Air Conditioning** and **Heat Transfer**.

Mr. Larmour is **Registered Professional Engineer** and has **Master** & **Bachelor** degrees in **Mechanical Engineering** and has a **Diploma** in **Nuclear Science**. Further, he is a **Certified Instructor/Trainer**.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Oil and Gas Flows*** *General Approach to Problem Solving*
0930 – 0945	*Break*

0945 – 1100	***Definitions Used in Fluid Mechanics*** *Properties of Fluids ● Density ● Specific Gravity ● Compressibility ● Surface Tension ● Viscosity ● Vapor Pressure*
1100 – 1230	***Static, Dynamic and Hydrostatic Pressures***
1230 – 1245	*Break*
1245 – 1420	***Worked Examples***
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***One-Dimensional, Steady Flows*** *General Introduction ● Continuity Relationship ● Bernoulli's Equation ● Worked Examples*
0930 – 0945	*Break*
0945 – 1100	***Applications to Flow Measurement 1*** *Venturi Meter ● Orifice-Plate ● Worked Examples*
1100 – 1230	***Applications to Flow Measurement 2*** *Flow Nozzle ● Worked Examples*
1230 – 1245	*Break*
1245 – 1330	***Applications to Flow Measurement 3*** *Pitot-Tube ● Pitot-Static Tube ● Worked Examples*
1330 – 1420	***Numerical Exercises***
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Steady Flows of Inviscid Fluids*** *Introduction to Momentum Concepts ● Applications*
0930 – 0945	*Break*
0945 – 1100	***Flows through Pipe Nozzles, Sudden Expansions and Bends*** *Worked Examples*
1100 – 1230	***Steady Flows of Viscous Fluids through Pipes*** *Introduction ● Flow Between Reservoirs ● Series and Parallel Pipes in Pipe Networks ● Worked Examples*
1230 – 1245	*Break*
1245 – 1330	***Power Transmission through Pipes*** *Nozzle at Pipe Outlet*
1330 – 1420	***Pipe Friction*** *Worked examples*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0930	***Dimensional Analysis*** *Introduction ● Model Testing ● Worked Examples*
0930 – 0945	*Break*
0945 – 1100	***Steady Flow of Viscous Fluids 1*** *Shear Stress in Pipes ● Laminar Flow through Circular Pipes ● Worked Examples*
1100 – 1230	***Steady Flow of Viscous Fluids 2*** *Laminar Flow Between Parallel Pipes ● Worked Examples*
1230 – 1245	*Break*
1245 – 1330	***Steady Flow of Viscous Fluids 3*** *Worked Examples*
1330 – 1420	***Steady Flow of Viscous Fluids 4*** *Worked Examples ● Discussion Forum*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Steady Compressible Pipe Flows 1*** *Introduction ● Stagnation Properties ● Velocity of Sound ● Mach Number*
0930 – 0945	*Break*
0945 – 1100	***Steady Compressible Pipe Flows 2*** *Additional Worked Examples*
1100 – 1230	***Steady Compressible Pipe Flows 3*** *Critical Ratio ● Nozzle Efficiency ● Worked Examples*
1230 – 1245	*Break*
1245 – 1345	***Group Discussion on Worked Examples*** *Final Discussion*
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

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

Course Coordinator

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