

**COURSE OVERVIEW ME0098**  
**Pump Technology**

**Course Title**  
 Pump Technology

**Course Reference**  
 ME0098

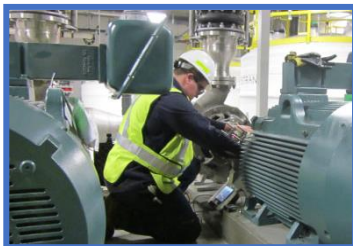
**Course Duration/Credits**  
 Five days/3.0 CEUs/30 PDHs

**Course Date/Venue**



Session(s)	Course Date	Venue
1	April 06-10, 2025	Olivine Meeting Room, Fairmont Nile City, Cairo, Egypt
2	May 25-29, 2025	Safir Meeting Room, Divan Istanbul, Turkey
3	July 28- August 01, 2025	Hampstead Meeting Room, London Marriott Hotel Regents Park, London, United Kingdom
4	September 14-18, 2025	Meeting Plus 9, City Centre Rotana, Doha, Qatar
5	November 23-27, 2025	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
6	January 25-29, 2026	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

**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.***



This course is designed to provide delegates with a detailed and up-to-date overview on the proper selection, installation, performance and control of pumps. It covers pump construction covering centrifugal pump, pump curves, characteristics, most common end-suction and in-line pump types, impeller and casing types, single-stage and multistage pumps, long coupled and close-coupled pumps as well as various types of pumps and mechanical shaft seals including its components, functions and factors affecting the seal performance.



The course will enable the participants to describe motors, liquids and materials and employ proper installation of pumps as well as analyze pump performance, system characteristics and pumps connected in series and parallel. Participants will be able to adjust pump performance and describe speed-controlled pump solutions for constant pressure and temperature control, constant differential pressure in a circulating system and flow compensated differential pressure control.

## Course Objectives

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

- Apply and gain an in-depth knowledge on the selection, installation, performance and control of various types of industrial pumps
- Recognize pump construction covering centrifugal pump, pump curves, characteristics, most common end-suction and in-line pump types, impeller and casing types, single-stage and multistage pumps as well as long coupled and close-coupled pumps
- Identify the various types of pumps and mechanical shaft seals including its components, functions and factors affecting the seal performance
- Describe motors, liquids and materials as well as employ proper installation of pumps
- Analyze pump performance, system characteristics and pumps connected in series and parallel

## 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 covers systematic techniques and methodologies in the selection, installation, performance and control of pumps for plant and maintenance engineers, process engineers, maintenance personnel, supervisors and reliability specialists working in refineries and petrol filling stations. The course is also highly valuable to senior maintenance technical staff who are involved with pumps, their operation and their maintenance.

## 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: -

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**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 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. Andrew Ladwig** is a **Senior Process & Mechanical Engineer** with over **25 years** of extensive experience within the **Oil & Gas, Refinery, Petrochemical & Power** industries. His expertise widely covers in the areas of **Ammonia Manufacturing & Process Troubleshooting, Distillation Towers, Crude Oil Distillation, Fundamentals of Distillation** for Engineers, **Distillation** Operation and Troubleshooting, **Advanced Distillation** Troubleshooting, **Distillation** Technology, **Vacuum Distillation, Ammonia Storage & Loading** Systems, **Ammonia Plant** Operation, Troubleshooting & Optimization, **Ammonia Recovery, Ammonia Plant Safety, Hazard of Ammonia Handling, Storage & Shipping, Operational Excellence in Ammonia Plants, Fertilizer Storage** Management (Ammonia & Urea), **Fertilizer Manufacturing** Process Technology, **Sulphur Recovery, Phenol Recovery & Extraction, Wax Sweating & Blending, Petrochemical & Fertilizer Plants, Nitrogen Fertilizer** Production, **Petroleum Industry Process** Engineering, **Refining Process & Petroleum Products, Refinery Planning & Economics, Safe Refinery Operations, Hydrotreating & Hydro-processing, Separators** in Oil & Gas Industry, **Gas Testing & Energy** Isolations, Gas Liquor Separation, **Industrial Liquid Mixing, Wax Bleachers, Extractors, Fractionation, Operation & Control of Distillation, Process of Crude ATM & Vacuum Distillation Unit, Water Purification, Water Transport & Distribution, Steam & Electricity, Flame Arrestors, Coal Processing, Environmental Emission Control, R&D of Wax Blending, Wax Molding/Slabbing, Industrial Drying, Principles, Selection & Design, Process Safety** Design, Certified **Process Plant** Operations, Control & Troubleshooting, **Operator** Responsibilities, **Storage Tanks Operations & Measurements, Tank Design, Construction, Inspection & Maintenance, Atmospheric Tanks, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Performance, Efficiency & Optimization, Continuous Improvement & Benchmarking, Process Troubleshooting** Techniques, Oil & Gas Operation/Introduction to **Surface Facilities, Pressure Vessel** Operation, **Plant & Equipment Integrity, Process Equipment** Performance & Troubleshooting, **Plant Startup & Shutdown, Startup & Shutdown** the Plant While Handling Abnormal Conditions, **Flare & Relief** System, **Process Gas Plant** Start-up, Commissioning & Problem Solving, **Process Liquid** and **Process Handling & Measuring** Equipment. Further, he is also well-versed in **Compressors & Turbines** Operation, Maintenance & Troubleshooting, **Heat Exchanger** Overhaul & Testing Techniques, Balancing of **Rotating Machinery (BRM), Pipe Stress** Analysis, **Valves & Actuators** Technology, Inspect & Maintain **Safeguarding Vent & Relief System**, Certified Inspectors for **Vehicle & Equipment**, Optimizing **Equipment Maintenance & Replacement** Decisions, Certified Maintenance Planner (**CMP**), Certified Planning and Scheduling Professional (**AACE-PSP**), **Material Cataloguing**, Specifications, Handling & Storage, **Steam Trap** Design, Operation, Maintenance & Troubleshooting, **Steam Trapping & Control, Column, Pump** Technology, **Pump** Selection & Installation, **Centrifugal Pumps** Troubleshooting, **Pumps** Design, Selection & Operation, **Pump & Exchangers**, Troubleshooting & Design, **Rotating Equipment** Operation & Troubleshooting, **Control & ESD** System, **Detailed Engineering Drawings**, Codes & Standards, **Budget** Preparation, Allocation & Cost Control, Root Cause Analysis (**RCA**), **Production Optimization**, Permit to Work (**PTW**), Project Engineering, **Data** Analysis, **Process Hazard** Analysis (**PHA**), **HAZOP** Study, Sampling & Analysis, **Training** Analysis, **Job Analysis** Techniques, Storage & Handling of **Toxic Chemicals & Hazardous Materials, Hazardous Material** Classification & Storage/Disposal, **Dangerous Goods**, Environmental Management System (**EMS**), Supply Chain, Purchasing, Procurement, **Logistics** Management & **Transport & Warehousing & Inventory, Risk** Monitoring Authorized Gas Tester (**AGT**), Confined Space Entry (**CSE**), Personal Protective Equipment (**PPE**), Fire & Gas, First Aid and Occupational Health & Safety.

During his career life, Mr. Ladwig has gained his practical experience through his various significant positions and dedication as the **Mechanical Engineer, Project Engineer, Reliability & Maintenance Engineer, Maintenance Support Engineer, Process Engineer, HSE Supervisor, Warehouse Manager, Quality Manager, Business Analyst, Senior Process Controller, Process Controller, Safety Officer, Mechanical Technician, Senior Lecturer** and **Senior Consultant/Trainer** for various companies such as the Sasol Ltd., Sasol Wax, Sasol Synfuels, just to name a few.

Mr. Ladwig has a **Bachelor's** degree in **Chemical Engineering** and a **Diploma** in **Mechanical Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and has delivered various trainings, workshops, seminars, courses and conferences internationally.



**Course Fee**

Doha	<b>US\$ 6,000</b> per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Istanbul	<b>US\$ 6,000</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
London	<b>US\$ 8,800</b> per Delegate + <b>VAT</b> . This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Cairo	<b>US\$ 5,500</b> per Delegate + <b>VAT</b> . 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 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	<i>Registration &amp; Coffee</i>
0800 – 0815	<i>Welcome &amp; Introduction</i>
0815 – 0830	<b>PRE-TEST</b>
0830 – 0930	<b>Pump Construction</b> <i>The Centrifugal Pump • Pump Curves • Characteristics of the Centrifugal Pump • Most Common End-Suction and In-Line Pump Types • Impeller Types (Axial Forces)</i>
0930 – 0945	<i>Break</i>
0945 – 1030	<b>Pump Construction (cont'd)</b> <i>Casing Types (Radial Forces) • Single-Stage Pumps • Multistage Pumps • Long-Coupled and Close-Coupled Pumps</i>
1030 – 1130	<b>Types of Pumps</b> <i>Standard Pumps • Split-Case Pumps • Hermetically Sealed Pumps • Sanitary Pumps</i>
1130 – 1245	<i>Break</i>
1245 – 1420	<b>Types of Pumps (cont'd)</b> <i>Wastewater Pumps • Immersible Pumps • Borehole Pumps • Positive Displacement Pumps</i>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day One</i>



**Day 2**

0730 – 0930	<b>Mechanical Shaft Seals</b> The Mechanical Shaft Seal's Components and Function • Balanced and Unbalanced Shaft Seals
0930 – 0945	Break
0945 – 1100	<b>Mechanical Shaft Seals (cont'd)</b> Types of Mechanical Shaft Seals
1100 – 1230	<b>Mechanical Shaft Seals (cont'd)</b> Seal Face Material Combinations
1230 – 1245	Break
1245 – 1420	<b>Mechanical Shaft Seals (cont'd)</b> Factors Affecting the Seal Performance
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Two

**Day 3**

0730 – 0930	<b>Motors</b> Standards • Motor Start-Up • Voltage Supply
0930 – 0945	Break
0945 – 1100	<b>Motors (cont'd)</b> Frequency Converter • Motor Protection
1100 – 1230	<b>Materials</b> What is Corrosion? • Types of Corrosion • Material and Metal Alloys • Ceramics
1230 – 1245	Break
1245 – 1420	<b>Materials (cont'd)</b> Plastics • Rubber • Coatings
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Three

**Day 4**

0730 – 0930	<b>Pump Installation</b> New Installation
0930 – 0945	Break
0945 – 1100	<b>Pump Installation (cont'd)</b> Existing Installation-Replacement
1100 – 1230	<b>Pump Installation (cont'd)</b> Pipe Flow for Single-Pump Installation
1230 – 1245	Break
1245 – 1420	<b>Pump Installation (cont'd)</b> Limitation of Noise and Vibrations • Sound Level (L)
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Four

**Day 5**

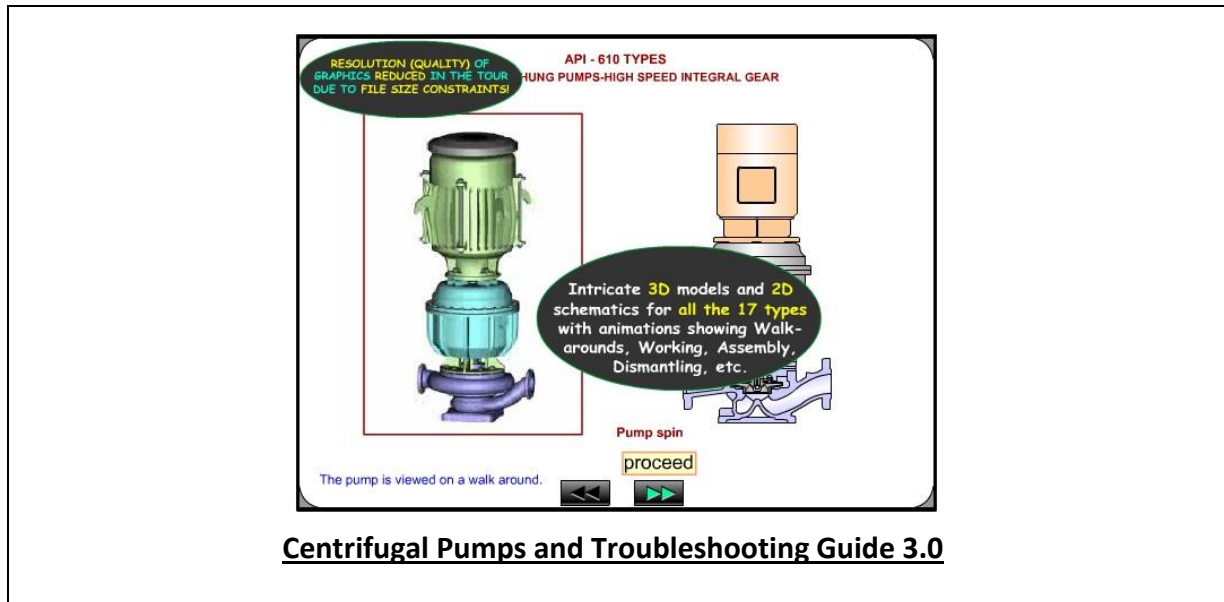
0730 – 0830	<b>Pump Performance</b> Hydraulic Terms
0830 – 0930	<b>Pump Performance (cont'd)</b> Electrical Terms • Liquid Properties
0930 – 0945	Break



0945 – 1230	<b>System Characteristics</b> Single Resistances
1230 – 1245	Break
1245 – 1345	<b>System Characteristics (cont'd)</b> Closed and Open Systems
1345 – 1400	<b>Course Conclusion</b>
1400 – 1415	<b>POST-TEST</b>
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

**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 simulator “Centrifugal Pumps and Troubleshooting Guide 3.0”.



**Course Coordinator**

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