



## COURSE OVERVIEW ME0630 The Layout of Piping Systems & Process Equipment

### Course Title

The Layout of Piping Systems & Process Equipment

### Course Reference

ME0630

### Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



### Course Date/Venue

Session(s)	Course Date	Venue
1	May 18-22, 2025	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
2	August 24-28, 2025	Safir Meeting Room, Divan Istanbul, Turkey
3	September 14-18, 2025	Meeting Plus 9, City Centre Rotana, Doha, Qatar
4	December 15-19, 2025	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
5	January 12-16, 2026	Hampstead Meeting Room, London Marriott Hotel Regents Park, London, United Kingdom
6	January 25-29, 2026	TBA Meeting Room, Four Seasons Hotels Cairo at Nile Plaza, Cairo, Egypt

### 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 will familiarize engineers, designers and construction personnel with layout, design procedures and practices involved in the location of equipment and layout of piping systems. Traditionally there has been little formal training in this area and design decisions have to be made based on practical considerations without formulae or code reinforcement.



Completing piping arrangements take up the majority of manhours in the design of a process plant and the designer is required to apply acceptable layout procedures. This is an intensive five-day course that will give attendees the background required to complete a typical equipment layout and piping arrangement.

The course will also highlight the equipment layout and plot plans; civil, structural, electrical, instrumentation and maintenance considerations; distribution systems; pipe racks; pumps and piping, layout at horizontal centrifugal, vertical inline, double suction, positive displacement, performance characteristics, maintenance, cavitation, suction piping considerations, strainers, valving, parallel layouts, series layouts, supports, loads at nozzles.





During this interactive course, participants will learn the heat exchanger piping, maintenance requirements, shell and tube, plate, fin fan, valving, T.E.M.A. standards; horizontal and vertical vessels, placement, nozzle orientation, internals, platforms, ladders, manholes, maintenance requirements, valving, instrumentation, process considerations; and the process and utility piping.

### Course Objectives

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

- Apply systematic techniques in the layout of piping systems and process equipment including design procedures and good international practices
- Implement the correct procedures involved in the layout of process equipment and piping system for a typical process unit containing pumps, valves, hangers, tanks, exchangers, horizontal drums and vertical towers
- Employ the requirements for the design and layout of piping system in order to achieve a well-structured installation of piping systems and process equipment
- Identify the factors that should be considered in the layout of equipment and plotting of plans including civil, structural, electrical and instrumentation aspects and other maintenance considerations
- Practice the various types of design and layout of piping system through workshops including process & utility piping, pump piping, storage tank piping, steam and condensate piping
- Implement nozzle orientation procedures in horizontal and vertical vessels
- Apply proper CAD techniques used in piping layout and piping stress analysis
- Perform the proper methodology for stress analysis using stress analysis programs and build flexible layouts

### 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 of the layout of piping systems & process equipment for piping, process and design engineers and designers entering the plant design field, senior draftsmen, piping and process draftsmen and practicing engineers requiring to expand their understanding of layout procedures. Further, it is suitable for piping fabricators, contractors and suppliers wishing to understand the relationship of manufacture and fabrication to the design, layout and construction of piping systems and piping design as well as analysis personnel wishing to expand their knowledge through this program which will offer practical solutions to design problems.



**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.
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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.

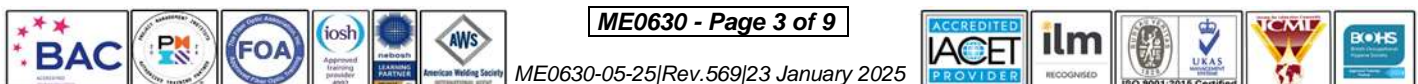
Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation 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.

**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 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, 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, 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, Steam & Electricity, Flame Arrestors, Coal Processing, Environmental Emission Control, R&D of Wax Blending, Wax Molding/Slabbing, Industrial Drying, Principles, Selection & Design, Certified Process Plant Operations, Control & Troubleshooting, Operator Responsibilities, Storage Tanks Operations & Measurements, 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, Process Equipment Performance & Troubleshooting, Plant Startup & Shutdown, Startup & Shutdown the Plant While Handling Abnormal Conditions, Process Gas Plant Start-up, Commissioning & Problem Solving, Process Liquid, Process Handling & Measuring Equipment, Steam Trap Design, Operation, Maintenance & Troubleshooting, Steam Trapping & Control, Column, Pump & Exchangers, Troubleshooting & Design, Rotating Equipment Operation & Troubleshooting, Control & ESD System, Root Cause Analysis (RCA), Dangerous Goods, Production Optimization, Permit to Work (PTW), Project Engineering, Data Analysis, HAZOP Study, Sampling & Analysis, Job Analysis Techniques, Hazardous Material Classification & Storage/Disposal, Risk Monitoring Authorized Gas Tester (AGT), Confined Space Entry (CSE), Process Hazard Analysis (PHA), 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.



**Accommodation**

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

**Course Fee**

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.
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.
Abu Dhabi	<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.
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.

**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>Introduction to Piping Layout</b> <i>P&amp;ID's • Piping Arrangements • Isometrics • B.O.M.'s • Piping Specifications</i>
0930 – 0945	<i>Break</i>
0945 – 1100	<b>Piping Components &amp; Valves</b> <i>Fittings – Butt Weld • Socket Weld • Threaded, Valve Types &amp; Application</i>
1100 – 1215	<b>Equipment Layout &amp; Plot Plans</b> <i>Civil, Structural, Electrical, Instrumentation, Maintenance Considerations</i>
1215 – 1230	<i>Break</i>
1230 – 1420	<b>Workshop (1)</b> <i>Problem Set</i>
1420 – 1430	<b>Recap</b>
1430	<i>Lunch &amp; End of Day One</i>





**Day 2**

0730 – 0830	<b>Workshop (1) Review</b>
0830 – 0930	<b>Process &amp; Utility Piping</b> Design & Layout of Piping Containing Liquid • Vapour • Steam • Condensate • Slurries • Etc.
0930 – 0945	Break
0945 – 1100	<b>Distribution Systems</b> Plot Plans • Pipe Racks – Line Spacing • Pipe Spans • Alloy Lines • Vibrating Lines • Expansion Loops
1100 – 1215	<b>Pipe Supports &amp; Hangers</b> Selection & Location • Anchors • Guides • Restraints • Variable Springs • Constant Load Springs
1215 – 1230	Break
1230 – 1420	<b>Horizontal Vessels</b> Placement • Nozzle Orientation • Internals • Platforms • Ladders
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Two

**Day 3**

0730 – 0830	<b>Workshop (2)</b> Review
0830 – 0930	<b>Pumps &amp; Piping</b> Layout at Horizontal Centrifugal • Vertical Inline • Double Suction • Positive Displacement • Performance Characteristics • Maintenance
0930 – 0945	Break
0945 – 1100	<b>Pumps &amp; Piping (cont'd)</b> Cavitation • Suction Piping Considerations • Strainers • Valving • Parallel Layouts • Series Layouts • Supports • API 610 Loads at Nozzles
1100 – 1215	<b>Heat Exchangers</b> Shell & Tube • Fin-Tube • Plate • Piping Layout Considerations • Nozzle Loading
1215 – 1230	Break
1230 – 1420	<b>Fin Fans</b> Locations • Types • Piping Arrangements
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Three

**Day 4**

0730 – 0830	<b>Workshop (3)</b> Review
0830 – 0930	<b>Storage Tanks</b> Tank Types • Fixed & Floating Roofs • Dyked Area Design • Fire Protection • Off Site Piping
0930 – 0945	Break
0945 – 1100	<b>Instrumentation</b> Level, Flow, Pressure & Temperature Variables • Control Valves & Sets • Relief Valves





1100 – 1215	<b>Steam &amp; Condensate Piping</b> Steam Traps • Condensate Collection Systems • Drip Legs • Steam Tracing Manifolds
1215 – 1230	Break
1230 – 1420	<b>Workshop (4)</b> Problem Set
1420 – 1430	<b>Recap</b>
1430	Lunch & End of Day Four

**Day 5**

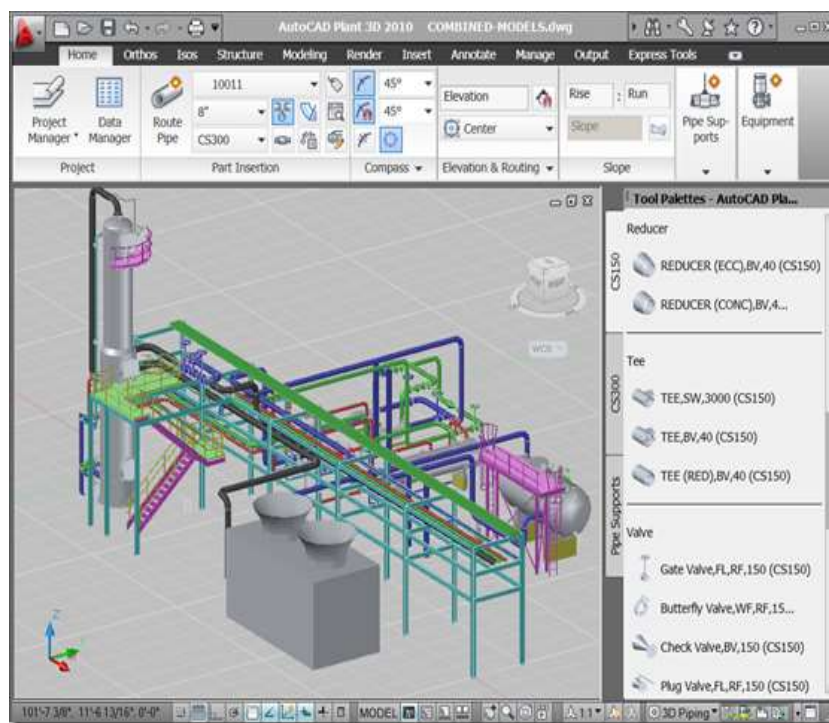
0730 – 0830	<b>Towers &amp; Vertical Vessels</b> Distillation Columns • Tower Internals • Trays • Packings • Reboilers • Nozzle Orientation • Piping at Towers • Supports
0830 – 0930	<b>Towers &amp; Vertical Vessels (cont'd)</b> Platforms & Ladders • Piping Layout
0930 – 0945	Break
0945 – 1115	<b>Compressors</b> Reciprocating • Centrifugal • Piping at Compressors • Vibration Considerations
1115 – 1215	<b>Purposes of Stress Analysis</b> Methodology • Static Analysis • Using Stress Analysis Programs
1215 – 1230	Break
1230 – 1315	<b>Stress Analysis</b> Building Flexible Layouts
1315 – 1345	<b>Static Stress Analysis</b> Problem Set
1345 – 1400	<b>Course Conclusion</b> Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
1400 – 1415	<b>POST-TEST</b>
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course



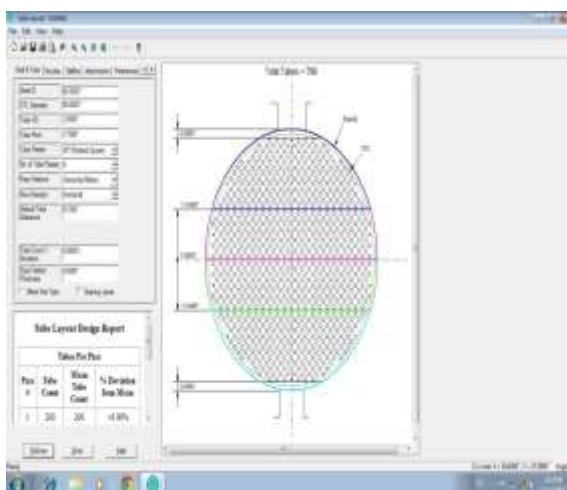


### Simulator (Hands-on Practical Sessions)

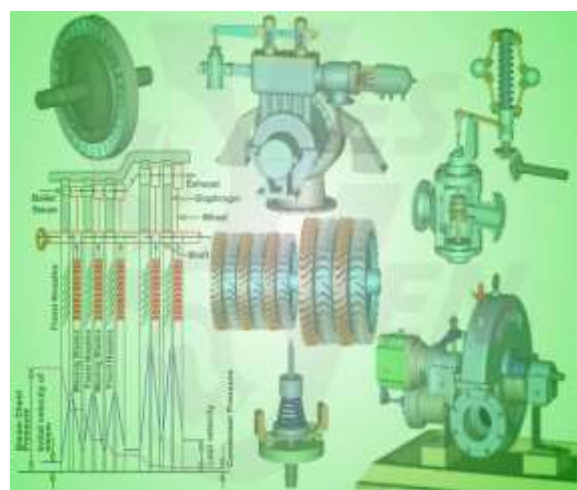
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators “Autocad Piping Software”, “Heat Exchanger Tube Layout Simulator”, “Steam Turbines & Governing System CBT”, “Single Shaft Gas Turbine Simulator” and “Two Shaft Gas Turbine Simulator”.



**Autocad Piping Software**

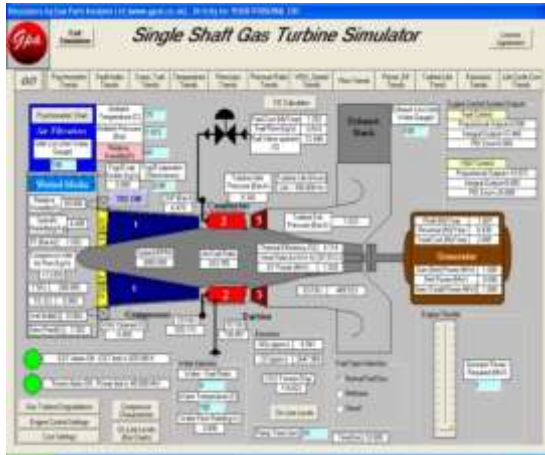


**Heat Exchanger Tube Layout Simulator**

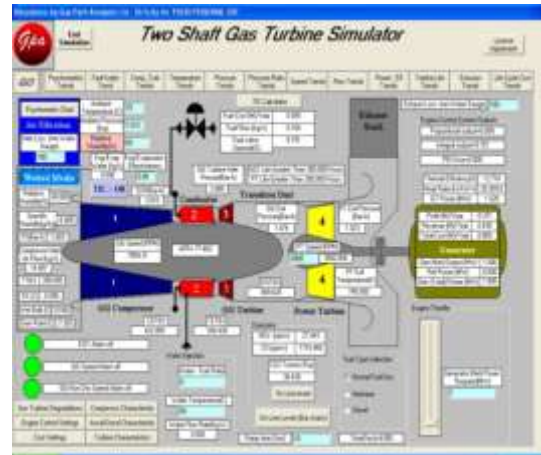


**Steam Turbines & Governing System CBT**





**Single Shaft Gas Turbine Simulator**



**Two Shaft Gas Turbine Simulator**

**Course Coordinator**

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