COURSE OVERVIEW ME0210
Mechanical Engineering for Non-Mechanical Engineers

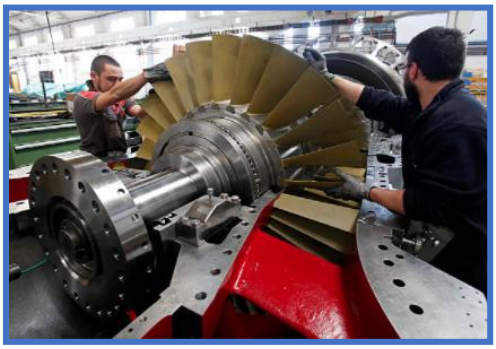
Course Title
Mechanical Engineering for Non-Mechanical Engineers

Course Date/Venue
July 27-31, 2025/Meeting Plus 9, City Centre Rotana, Doha, Qatar

Course Reference
ME0210

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

Course Description



This hands-on, 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.

Engineers from all disciplines and other professionals and technical personnel in both the industrial and commercial environments need a good understanding of the basic concepts that underlie the application of mechanical engineering to the successful and efficient installation and operation of mechanical and plant equipment and systems. This course is aimed at participants who either had no formal training in mechanical engineering or are seeking a refresher to increase and enhance their current knowledge.

This course is developed to provide non-mechanical engineers and technical staff with the necessary fundamentals training to ensure a basic understanding of mechanical components and mechanical systems. It includes information on diesel engines, heat exchangers, pumps, valves, and miscellaneous mechanical components. This information will provide participants with a foundation for understanding the construction and operation of mechanical components that are associated with the facility operations and maintenance.

Course Objectives

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

- Apply and gain a good working knowledge and overview on mechanical engineering
- Define the operation of pumps, drivers and pumping systems and identify the types of couplings, their application, function, operation and maintenance
- Operate pressure vessels, fans, blowers and compressors and become familiar with rotary, centrifugal and reciprocating compressors, the function of their respective components, and the operation and preventive maintenance required thereof
- List the fundamentals of diesel engines, their operating principles and protective features and experiment bearing and lubrication
- Recognize the applications and classifications of valves
- Evaluate heat exchangers and assess heat transfer systems and equipments, fired boilers, process heaters and heat recovery equipment
- Illustrate HVAC and refrigeration systems and design and inspect storage tanks and the various types of separators
- Manage instrumentation and control of mechanical equipments

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 a complete and up-to-date overview of mechanical engineering for professionals who need to upgrade their current experience and knowledge of mechanical engineering including engineers from other disciplines, mechanical engineers who require practical knowledge of certain aspects of mechanical engineering, industrial and commercial plant and facilities engineers and operators, consultants, property managers, project engineers, design engineers and other technical personnel who are involved in the operation and maintenance of mechanical equipment, systems and processes.

Accommodation

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

Course Fee

US$ 6,000 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

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

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. Karl Thanasis, PEng, MSc, MBA, BSc, is **Senior Mechanical & Maintenance Engineer** with over **30 years** of extensive industrial experience within the **Power & Water Utilities** and other **Energy Sectors**. His wide expertise includes **District Cooling Plant**, **District Cooling Plant Operations**, **HVAC** Basics, **HVAC&R**, **KOTZA**, **Refrigeration**, **Modern HVAC & Refrigeration Systems Design, Utilization, Operation & Effective Maintenance, Control Valve & Actuators**, **Fire Safe Valves**, **Piping & Pipeline**, Maintenance, Repair, **Shutdown**, **Turnaround & Outages**, **Maintenance & Reliability** Management, **Mechanical Maintenance** Planning, Scheduling & Work Control, Advanced Techniques in **Maintenance** Management, **Predictive & Preventive** Maintenance, **Maintenance & Operation Cost Reduction** Techniques, Reliability Centered Maintenance (**RCM**), **Machinery Failure** Analysis, **Rotating Equipment Reliability** Optimization & Continuous Improvement, **Material Cataloguing**, **Mechanical & Rotating Equipment** Troubleshooting & Maintenance, **Root Cause Analysis & Reliability** Improvement, **Condition** Monitoring, **Root Cause Failure Analysis** (RCFA), **Steam Generation**, **Steam Turbines**, **Power Generator Plants**, **Gas Turbines**, **Combined Cycle Plants**, **Boilers**, **Process Fired Heaters**, Air Preheaters, Induced Draft Fans, All Heaters Piping Work, Refractory Casting, Heater Fabrication, Thermal & Fired Heater Design, **Heat Exchangers**, Heat Transfer, Coolers, **Power Plant** Performance, Efficiency & Optimization, **Storage Tank** Design & Fabrication, **Thermal Power Plant** Management, **Boiler & Steam** System Management, **Pump** Operation & Maintenance, **Chiller & Chiller Plant** Design & Installation, **Pressure Vessel**, **Safety Relief Valve** Sizing & Selection, **Valve** Disassembling & Repair, Pressure Relief Devices (**PSV**), **Hydraulic & Pneumatic** Maintenance, Advanced **Valve** Technology, **Pressure Vessel** Design & Fabrication, **Pumps**, Turbo-Generator, Turbine **Shaft Alignment**, **Lubrication**, Mechanical **Seals**, Packing, **Blowers**, **Bearing** Installation, **Couplings**, **Clutches** and **Gears**. Further, he is also versed in **Wastewater Treatment** Technology, **Networking** System, **Water Network Design**, Industrial **Water Treatment** in Refineries & Petrochemical Plants, **Piping** System, Water Movement, Water Filtering, Mud Pumping, **Sludge Treatment** and **Drying**, **Aerobic Process** of **Water Treatment** that includes **Aeration**, **Sedimentation** and **Chlorination Tanks**. His strong background also includes **Design** and **Sizing** of all **Waste Water Treatment Plant Associated Equipment** such as **Sludge Pumps**, **Filters**, **Metering Pumps**, **Aerators** and **Sludge Decanters**.

Mr. Thanasis has acquired his thorough and practical experience as the **Project Manager**, **Plant Manager**, **Area Manager - Equipment Construction**, **Construction Superintendent**, **Project Engineer** and **Design Engineer**. His duties covered **Plant Preliminary Design**, **Plant Operation**, **Write-up** of **Capital Proposal**, **Investment Approval**, **Bid Evaluation**, **Technical Contract Write-up**, **Construction** and **Sub-contractor Follow up**, **Lab Analysis**, **Sludge Drying** and **Management** of **Sludge Odor** and **Removal**. He has worked in various companies worldwide in the **USA**, **Germany**, **England** and **Greece**.

Mr. Thanasis is a **Registered Professional Engineer** in the **USA** and **Greece** and has a **Master's** and **Bachelor's** degree in **Mechanical Engineering** with **Honours** from the **Purdue University** and **SIU** in **USA** respectively as well as an **MBA** from the **University of Phoenix** in **USA**. Further, he is a **Certified Internal Verifier/Trainer/Assessor** by the **Institute of Leadership & Management** (**ILM**) a **Certified Instructor/Trainer** and has delivered numerous trainings, courses, seminars, workshops and conferences worldwide.

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, 27th of July 2025***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Mechanical Engineering – An Overview*** *Strength of Materials ● Torque and Power*
0930 – 0945	*Break*
0945 – 1100	***Mechanical Engineering – An Overview (cont'd)*** *Power Transmission ● Fluid Engineering and Piping Systems*
1100 – 1230	***Pumps, Drivers and Pumping Systems*** *Explains the Operation of Centrifugal and Positive Displacement Pumps. Topics Include Net Positive Suction Head, Cavitations, Gas Binding, and Pump Characteristic Curves*
1230 – 1245	*Break*
1245 – 1420	***Couplings*** *Explains the Types of Couplings (Flexible Type & Fixed Type), Their Applications, How Do It Work and the Coupling Maintenance*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Monday, 28th of July 2025***

0730 – 0900	***Pressure Vessels***
0900 – 0915	*Break*
0915 – 1100	***Fans, Blowers and Compressors***
1100 – 1230	***Rotary Compressors*** *Explains Construction of Rotary Screw Compressor, the Function of the Compressor Components, Driving System, Accessories and Operation & Preventive Maintenance*
1230 – 1245	*Break*

1245 – 1420	***Centrifugal Compressors*** *Explains Basic Introduction, Centrifugal Compressor Components, Compressor Seals, Shaft Bearings, Lubrication System, Compressor Drivers & Couplings, Compressor Instrumentation and Control, Compressor Operation & Maintenance*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: ***Tuesday, 29th of July 2025***

0730 – 0930	***Reciprocating Compressors*** *Explains Reciprocating Compressor Working Principle, Compressor Components, and Cooling Systems, Lubrication, Compressor Operation, Maintenance*
0930 – 0945	*Break*
0945 – 1100	***Diesel Engines*** *Explains Diesel Engine Fundamentals, the Basic Operating Principles of 2-Cycle and 4-Cycle Diesel Engines. Includes Operation of Engine Governors, Fuel Ejectors, and Typical Engine Protective Features*
1100 – 1230	***Bearing & Lubrication*** *Explains Introduction to Bearings, Sliding Surface Bearings, Sliding Surface Bearing Failure, Rolling Element Bearings (Anti – Friction Bearings)*
1230 – 1245	*Break*
1245 – 1420	***Bearing & Lubrication (cont'd)*** *Bearing Installation, Lubrication System*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: ***Wednesday, 30th of July 2025***

0730 – 0930	***Valves*** *Explains Introduces the Functions of the Basic Parts Common to Most Types of Valves. Provides Information on Applications of Many Types of Valves. Types of Valves Covered Include Gate Valves, Globe Valves, Ball Valves, Plug Valves, Diaphragm Valves, Reducing Valves, Pinch Valves, Butterfly Valves, Needle Valves, Check Valves, and Safety/Relief Valves*
0930 – 0945	*Break*
0945 – 1100	***Heat Exchanger*** *Explains the Construction of Plate Heat Exchangers and Tube and Shell Heat Exchangers. Describes the Flow Patterns and Temperature Profiles in Parallel Flow, Counter Flow, and Cross Flow Heat Exchangers*
1100 – 1230	***Heat Transfer Systems and Equipment***
1230 – 1245	*Break*
1245 – 1420	***Fired Boilers, Process Heaters & Heat Recovery Equipment***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

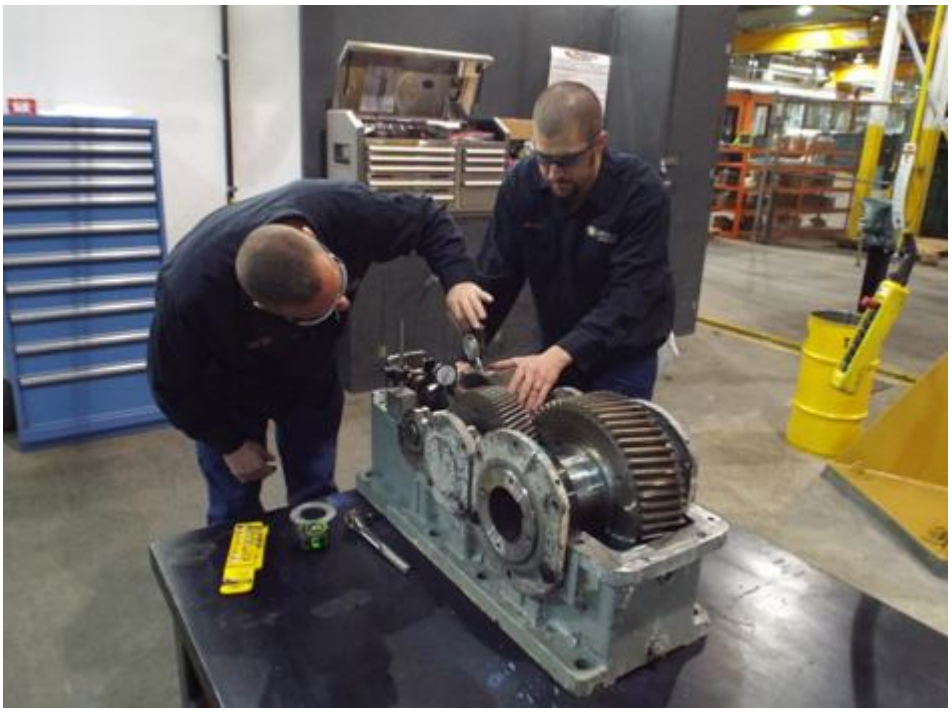
Day 5: ***Thursday, 31st of July 2025***

0730 – 0930	***HVAC and Refrigeration Systems and Design***
0930 – 0945	*Break*
0945 – 1100	***Storage Tanks*** *Explains the Types of Storage Tanks such as Liquid Storage Tanks, Maintenance of Storage Tanks (Basic Introduction), Hazardous Conditions and Safety Procedures*
1100 – 1230	***Separators*** *Explains Separation Fundamentals, Separators Description, Separator Types, Separator Internals and Material of Construction*
1230 – 1245	*Break*

1245 – 1345	***Instrumentation and Control***
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This hands-on, highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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