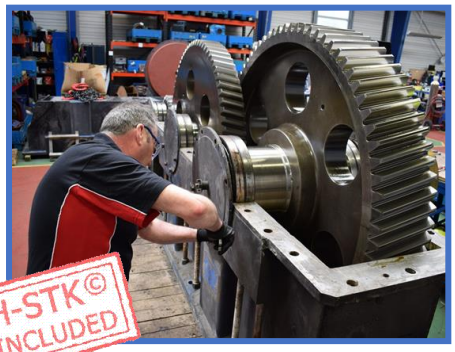
COURSE OVERVIEW ME0230-2D
Gearboxes

Course Title
Gearboxes

Course Reference
ME0230-2D

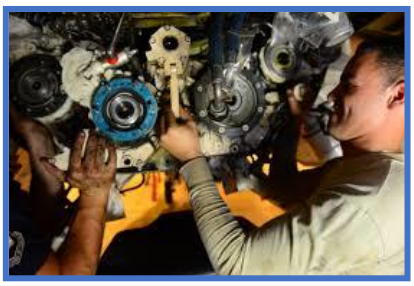
Course Duration/Credits
Two days/1.2 CEUs/12 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	May 11-12, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	July 14-15, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	September 14-15, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	November 10-11, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

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.

This course is designed to provide participants with a detailed and up-to-date overview of the selection, inspection, maintenance, troubleshooting and repair of gearboxes. It covers the types of gears, including its arrangement and geometry, gear ratings and quality; the configurations and operating characteristics of bearings; and the gearbox lubrication including its various system types, key lubricant characteristics and modes of lubrication failure.

During this interactive course, participants will learn the gear instrumentation measurements and the various analytical tools used in gearboxes; the gearbox testing that spin testing, partial and full load testing and full torque testing; the different gear element failure modes; and the bearing failure modes and gearbox selection requirements.

Course Objectives

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

- Select, inspect, maintain, troubleshoot and repair a variety of industrial gearboxes
- Develop good background and foundation on gearing and identify the types of gears, their arrangement and geometry, gear ratings and quality
- Recognize the configurations and operating characteristics of bearings and become familiar with the gearbox lubrication including its various system types, key lubricant characteristics and modes of lubrication failure
- Implement gear instrumentation measurements and identify the various analytical tools used in gearboxes
- Perform gearbox testing such as spin testing, partial & full load testing and full torque testing and be able to determine the different gear element failure modes
- Characterize bearing failure modes and apply the gearbox selection requirements

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 gearboxes for those who are involved in the selection, inspection, maintenance, troubleshooting and repair of gearboxes. This includes maintenance and mechanical design staff. Further, the course can serve as a good primer for those who would like a general understanding of fundamental gearing issues.

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$ 2,750 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 **1.2 CEUs** (Continuing Education Units) or **12 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. Karl Thanasis, PEng, MSc, MBA, BSc, is **Senior Mechanical & Maintenance Engineer** with over **30 years** of extensive industrial experience. His wide expertise includes **Compressors** Maintenance & Troubleshooting, **Screw Compressor MK/WRV** Operation Maintenance & Troubleshooting, **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.

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	***Gearing Fundamentals*** *Types of Gears ● Arrangement and Geometry ● Mesh Operations • Heat treating Techniques ● Gear Ratings and Quality*
0930 – 0945	*Break*
0945 – 1030	***Bearings*** *Rolling Element ● Fixed, Floating, Ball, etc. ● Hydrodynamic Fluid Film Bearings • Bearing Configurations ● Operating Characteristics*
1030 – 1130	***Gearbox Lubrication & Principles*** *Viscosity Index and Pour Point ● Types of Lubrication Systems • Thermal Ratings ● Key Lubricant Characteristics ● Modes of Lubrication Failure*
1130 – 1215	***Gear Instrumentation Measurements*** *Temperature ● Flow ● Pressure • Vibration ● Noise*
1215 – 1230	*Break*
1230 – 1330	***Analytical Tools*** *Gear Design and Rating ● Rotor Dynamics • Bearing and Shaft Analysis ● Unbalanced Response Program ● Finite Element Analysis*
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 – 0830	***Gearbox Testing*** *Spin Testing ● Partial Load Testing ● Full Load Testing • Full Torque Testing ● Post-Test Disassembly and Inspection*
0830 – 0930	***Gear Element Failure Modes*** *Pitting Failures ● Overloading Failures • Tooth Fractures ● Misalignment ● Abrasive Wear*
0930 – 0945	*Break*
0945 – 1100	***Bearing Failure Modes*** *Overheating ● Corrosion ● Scoring • Slippage Tracks ● Contamination*
1100 – 1215	***Gearbox Selection Requirements*** *Prime Movers ● Driven Equipment • Couplings • System Arrangement ● Operating Conditions*
1215 – 1230	*Break*

1230 – 1345	***General Discussion, Question & Answers***
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about t 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

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org