

COURSE OVERVIEW ME0200
Bearing Lubrication, Installation, Inspection, Maintenance,
Troubleshooting & Failure Analysis
Bearing Root Cause Failure Analysis

Course Title

Bearing Lubrication, Installation, Inspection, Maintenance, Troubleshooting & Failure Analysis: *Bearing Root Cause Failure Analysis*

Course Reference

ME0200

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	January 19- 23, 2025	Oryx Meeting Room, Double Tree by Hilton Al Saad, Doha, Qatar
2	April 20- 24, 2025	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
3	June 30- July 04, 2025	Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	October 19-23, 2025	Al Khobar Meeting Room, Hilton Garden Inn, Al Khobar, KSA

Course Description



This practical and highly-interactive course includes practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.



It is an industry recognized fact that in excess of 90% of premature bearing failures can be attributed to lubrication, contamination or installation issues. Determining the true cause of bearing failure, subsequently correcting this problem and then adopting the correct fitting procedures can dramatically increase bearing life and resulting in an overwhelming increase in equipment reliability and a dramatic reduction in unplanned downtime.



This course introduces a maintenance employee to the basic types of bearings and common nomenclature used. Bearing design, installation and maintenance is discussed with a focus on preventing premature failure. The participant is also trained to analyze failed bearings so a similar occurrence will not happen again.

Upon the successful completion of this course, each participant will be able to identify common sources of premature machinery failure and define precision mechanical maintenance practices to improve performance and extend machinery life.

This course is designed to get the most critical part of a Machinery Improvement program into action. Skills and awareness to both maintain and considerably improve your equipment are presented and practiced in an easy to understand format. It is also designed in order to make participants familiar with how to remove, inspect, maintain, select, design, handle, install, and troubleshoot bearings according to manufacturers' instructions and best practices. Participants learn how to identify replacement bearings and install and maintain the bearings properly using the right tools.

Course Objectives

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

- Apply systematic techniques on bearing lubrication, installation, inspection, maintenance, troubleshooting and failure analysis
- Identify different bearing components including plain bearing, ball or roller bearings, cage assembly and others
- Estimate the improvement in bearing materials and designs
- Enumerate different bearing types and their applications
- Perform bearing installation and inspect bearing lubrications
- Analyze the lead, speed, life and tolerance of bearings and evaluate the reasons for bearing failure and failures caused by internal radial clearance
- Identify shaft and housing fits of bearings
- Conduct failure analysis, condition monitoring and proper handling to preserve bearing life
- Demonstrate proper precision alignment, mounting and dismounting procedures
- Evaluate the precision balancing and the effect of assembly errors
- Estimate bearing life and identify the causes of immediate bearing failures

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 on the lubrication, installation, inspection, maintenance, troubleshooting and failure analysis of bearings for maintenance and reliability engineers and other maintenance staff.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations


Certificates are accredited by the following international accreditation organizations: -

-  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.

-  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.

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:

	<p>Mr. Karl Thanasis, PEng, MSc, MBA, BSc, is Senior Mechanical & Maintenance Engineer with over 45 years of extensive industrial experience. His wide expertise includes 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.</p> <p>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.</p> <p>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.</p>
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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

Doha	US\$ 6,000 per Delegate. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.
Dubai	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.
Abu Dhabi	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.
Al Khobar	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 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 and Coffee</i>
0800 – 0815	<i>Welcome & Introduction</i>
0815 – 0830	PRE-TEST
0830 – 0930	Introduction <i>The Bearing Equation • Improvements in Bearing Materials and Design • Dynamic Load Ratings of Bearings Versus Actual Forces</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Bearing Components <i>Plain Bearings • Ball or Roller Bearings • Cage Assembly • Seals, Shields, Snap-Rings and Bearing Hardware</i>
1100 – 1230	Bearing Types & Applications <i>Types of Radial Ball Bearings and Their Uses • Types of Radial Roller Bearings and Their Uses • Pre-Mounted Bearings (Flange, Pillow Block, etc.) • Understanding Manufacturers Identification Numbers</i>
1230 – 1245	<i>Break</i>
1245 – 1420	Bearing Types & Applications (cont'd) <i>ABMA Identification • Identifying Bearing Hardware • Internal Clearance and Bearing Application • ABEC and RBEC Tolerances</i>

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	Bearing Installation The Importance of Cleanliness • Mounting Tapered Shaft Bearings • Proper Bearing Fits and Methods to Correct Loose Fits
0930 – 0945	Break
0945 – 1100	Bearing Installation (cont'd) Proper Bearing Installation Using Heat, Force and Other Methods • Classroom Exercise
1100 – 1230	Bearing Lubrication Purpose of Lubrication in Bearings • When to Use Oil vs. Grease • Lubrication Methods and Frequency
1230 – 1245	Break
1245 – 1420	Bearing Inspection Proper Disassembly and Cleaning for Inspection • Common Failure Modes • Classroom Inspection and Analysis Exercise
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	Bearing Maintenance Overview of Precision Maintenance and Why it Contributes to Bearing Life • Understanding Proactive Rather than Reactive Maintenance Philosophy
0930 – 0945	Break
0945 – 1100	Tolerance Examining Bearing Tolerance and the Reason for Them
1100 – 1230	Shaft & Housing Fits What & Why Bearing Fit has an Effect on Bearing Performance and Life
1230 – 1245	Break
1245 – 1420	Internal Radial Clearance A look at Why Internal Clearances can Cause Failure
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0930	Failure Analysis & Condition Monitoring Overview of Vibration Sources and Effects
0930 – 0945	Break
0945 – 1100	Failure Analysis & Condition Monitoring (cont'd) Effects of Balance on Vibration Analysis
1100 – 1230	Proper Handling How Handling Preserves Bearing Life and Ease of Installation
1230 – 1245	Break

1245 – 1420	Mounting & Dismounting <i>Common Errors in Bearing Removal and Installation</i>
1420 – 1430	Recap
1430	<i>Lunch & End of Day Four</i>

Day 5

0730 – 0930	Vibration Terminology & Analysis <i>Understanding Vibration Causes, Effects and Remedies</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Precision Alignment Fundamentals <i>What it Takes to Perform Precision Alignment</i>
1100 – 1230	Precision Balancing & the Effect of Assembly Errors <i>Why Balancing Effects Maximum Bearing Life</i>
1230 – 1245	<i>Break</i>
1245 – 1345	Bearing Life & Why Bearings Fail Early <i>Typical Causes of Bearing Failure and How to Avoid Them</i>
1345 – 1400	Course Conclusion
1400 – 1415	POST-TEST
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

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 the state-of-the-art simulator “iLearnVibration”.



Course Coordinator

Jaryl Castillo, Tel: +974 4423 1327, Email: jaryl@haward.org