COURSE OVERVIEW RE0805-9D
Vibration Analyst Category: Category IV (Mobius Institute)

Course Title
Vibration Analyst Category: Category IV (Mobius Institute)

Course Date/Venue
Session 1: April 12-16, 2026/Tamra Meeting Room, Al Baandar Rotana Creek, Dubai, UAE
Session 2: August 02-06, 2026/Crowne Meeting Room, Crowne Plaza Al Khobar, an IHG Hotel, Al Khobar, KSA

Course Reference
RE0805-9D

Course Duration/Credits
Nine days/6.4 CEUs/64 PDHs
(4 days: Part 1 – Online Component, plus
5 days: Part 2 – Classroom Component)

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.

Vibration analysis is defined as a process for measuring the vibration levels and frequencies of machinery and then using that information to analyze how healthy the machines and their components are. While the inner-workings and formulas used to calculate various forms of vibration can get complicated, it all starts with using an accelerometer to measure vibration. Anytime a piece of machinery is running, it is making vibrations. An accelerometer attached to the machine generates a voltage signal that corresponds to the amount of vibration and the frequency of vibration the machine is producing, usually how many times per second or minute the vibration occurs.

This course is designed to provide participants with a detailed and up-to-date overview of ISO Vibration Level IV in accordance with ISO 18436. It covers the principles of vibration, data acquisition and signal processing; the condition monitoring, fault analysis and corrective action; the equipment testing and diagnostics, reference standards and reporting and documentation; and the fault severity determination and rotor/bearing dynamics.

Course Objectives

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

- Get prepared for the next Vibration Analyst exam and have enough knowledge and skills to pass such exam in order to get certified as "*Vibration Analyst: Category IV*" in accordance with ISO 18436 standards from the Mobius Institute
- Discuss the vectors, modulation, phase, natural frequency, resonance and critical speeds
- Explain force, response, damping, stiffness, instabilities and non-linear systems
- Determine instrumentation, dynamic range and signal-to-noise ratio and apply test planning and procedures
- Carryout RMS/peak detection, analogue/digital conversion and sampling and FFT computation
- Discuss low pass, high pass, band pass and tracking filters including anti-aliasing, bandwidth, resolution and noise reduction
- Recognize averaging: linear, synchronous time, exponential, dynamic range, signal-to-noise ratio and spectral maps
- Illustrate monitoring programme design, oil analysis, infrared thermography, motor current analysis and acoustic emission
- Apply spectrum and time waveform analysis, phase and transient analysis as well as orbit and shaft centreline analysis
- Identify electric motor defects, flow induced vibration, aerodynamics, liquids, resonance, critical speeds and turbomachinery
- Carryout field balancing, flow control, isolation and damping and resonance control
- Employ impact testing, forced response testing, transient analysis, damping evaluation and modal analysis
- Review reference standards covering ISO, IEC and relevant national standards
- Discuss vibration diagnostics reports and apply spectrum analysis, time waveform analysis, orbit analysis, severity charts, graphs and formula
- Describe rotor/bearing dynamics covering rotor characteristics, bearing characteristics and rotor balancing

Who Should Attend

This course provides an overview of all significant aspects and considerations of ISO Vibration Analysis Category IV for those who are involved in the measurement, analysis, dynamics and balancing of turbomachinery. This includes maintenance, reliability, rotating equipment, process, control and instrumentation personnel, engineers, maintenance supervisors, mechanical foremen, specialists and other technical staff.

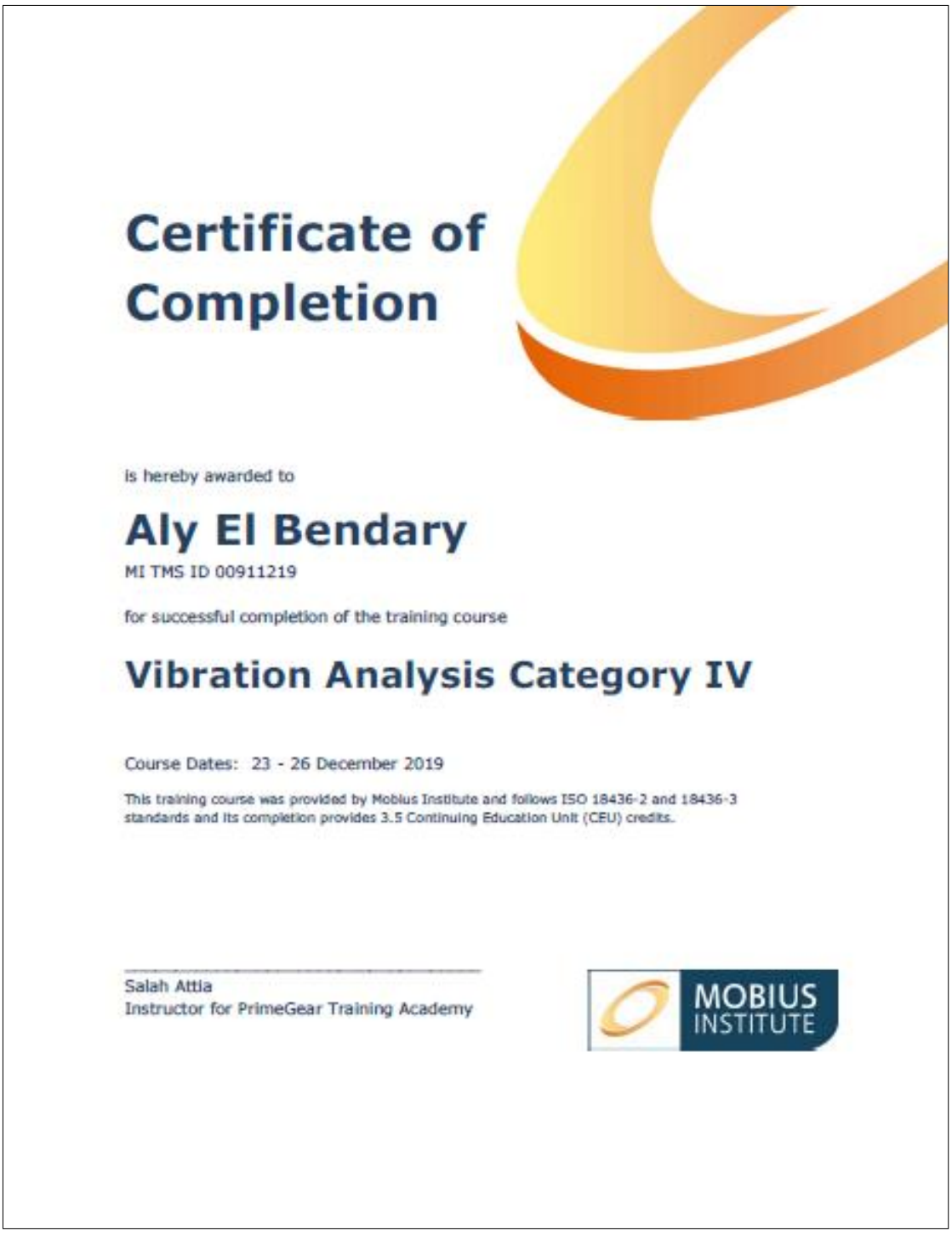
Exam Eligibility & Structure

Exam candidates shall have the following minimum prerequisites:-

- Successfully completed two (2) or more years of mechanical technology or mechanical engineering at an accredited college, university or technical school
- Should be familiar with current VA technology
- Minimum 60 months of Vibration Analysis experience
- Must hold a Vibration Analyst Category III

Course Certificate(s)

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



Certificate of Completion

is hereby awarded to

Aly El Bendary

MI TMS ID 00911219

for successful completion of the training course

Vibration Analysis Category IV

Course Dates: 23 - 26 December 2019

This training course was provided by Mobius Institute and follows ISO 18436-2 and 18436-3 standards and its completion provides 3.5 Continuing Education Unit (CEU) credits.

Salah Attia
Instructor for PrimeGear Training Academy

MOBIUS INSTITUTE

(2) Mobius Institute will certify the participants who will pass the examination for ***Vibration Analyst: Category IV***.

MOBIUS INSTITUTE
BOARD of CERTIFICATION

MOBIUS INSTITUTE
BOARD OF CERTIFICATION
certifies that

xxxxxxxxxxxxx

has met the experience, training and examination requirements
for conformity to ISO 18436 as

VIBRATION ANALYST: CATEGORY IV

ISO/IEC 17024 accredited in
accordance with ISO 18436-1

This certificate remains the property of
Mobius Institute Board of Certification.

www.mobiuscertification.org

Certification Number: M-138282-01
Date of Certification: 6 November 2019
Certification Expires: 6 November 2024

Jason Tranter, Founder, CEO
Mobius Institute Board of Certification

(3) Official Transcript of Records will be provided to the successful delegates with the equivalent number of ANSI/IACET accredited Continuing Education Units (CEUs) earned during the course.

Haward Technology Middle East

Continuing Professional Development (HTME-CPD)

Page 1 of 1

CEU Official Transcript of Records

TOR Issuance Date: 22-Aug-19

HTME No. 8667-2014-9020-2547

Participant Name: Ismail Al Hammadi

Program Ref.	Program Title	Program Date	No. of Contact Hours	CEU's
RE0805-IH	ISO Vibration Certification Level IV (CAT IV-ISO 18436) *Training, Exam and Certification*	August 18-22, 2019	32.5	3.25

Total No. of CEU's Earned as of TOR Issuance Date **3.25**

TRUE COPY

Maricel De Guzman
Academic Director

Haward Technology has been approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this approval, Haward Technology has demonstrated that it complies with the ANSI/IACET 1-2013 Standard which is widely recognized as the standard of good practice internationally. As a result of their Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for programs that qualify under the ANSI/IACET 1-2013 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 Association 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 is accredited by

P.O. Box 26070, Abu Dhabi, United Arab Emirates | Tel.: +971 2 3091 714 | Fax: +971 2 3091 716 | E-mail: info@haward.org | Website: www.haward.org

Certificate Accreditations

Haward's certificates are accredited by the following international accreditation organizations: -

- Mobius Institute Board of Certification (MIBoC) Scheme

  Mobius Institute Board of Certification (**MIBoC**) is ISO/IEC 17024 and ISO 18436-1 accredited and provides globally recognised certification for Vibration Analysis, Infrared Thermography, Ultrasound and Asset Reliability. MIBoC is an impartial and independent entity that is directed by scheme and technical committees to ensure that its certification meets or exceeds the requirements defined by the applicable ISO standards. Haward Technology is a partner of various Mobius Training Partners.

- 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 **6.4 CEUs** (Continuing Education Units) or **64 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. Khaled Ibrahim, BSc, APR-E, ARP-A, VA, is a **Senior Mechanical Engineer** and **Asset Management Specialist** with over extensive years of industrial experience within the **Oil & Gas**, **Refinery** and **Petrochemical** industries. His expertise widely covers in the areas of **Condition Monitoring & Asset** Management, **Asset Reliability & Lubrication**, **RBI** Assessment, AIV & FIV, **Vibration** Techniques, Advanced **Vibration** Analysis, **Acoustic & Flow Induced Vibration**, **Thermal Imaging** Technology, **Precision Machinery Alignment**, **Laser Alignment**, Machinery Balancing, Criticality Assessment, **FMEA**, **Root Cause** Analysis, Defect Elimination, **Ultrasound** Technology, Design Engineering System, Protection & Monitoring System, **Static** Equipment, **Static Risk** Assessment, Baseline Survey Analysis, **Machinery** Maintenance, **Shutdown & Turnaround**, **Thermal Imaging**, Oil Testing & Analysis, Borescope Inspection, Rockwell Automation, Azima, IT Concept, Metric Vibration, CTC Sensors, Artesis MCSA, Pipeline Corrosion Loops, Offshore Safety Induction & Emergency, Energy & Waste Management and BOSIET/OPITO. Currently, he is the **Business Development Manager** wherein he is in-charge of developing market and spreading awareness of asset management solutions in MENAT region.

During his career life, Mr. Khaled has gained his practical and field experience through his various significant positions and dedication as the Asset Manager, **Technical Services Manager**, **Senior Condition Monitoring Consultant**, **Condition Monitoring Team Leader**, **Senior Rotating Engineer** and **Senior Instructor/Trainer** for numerous multi-billion companies including the UDPS, KMT, Veolia, PROACT Engineering, PETROFAC and PETROMAINT.

Mr. Khaled has a **Bachelor's** degree in **Power Mechanical Engineering**. Further, he is a **Certified Asset Reliability Practitioner ARP-E & ARP I&II** from the **Mobius Institute**, Certified Level 1 Machinery Lubrication Analyst (**MLA-1**), Certified **ISO Vibration Level IV** Global Instructor, Certified Level 1 Ultrasound, Certified Reliability Leader (**CRL**), Certified Basic Offshore Safety Induction & Emergency BOSIET and Certified **ISO ARP-A** Global Instructor. He has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.

Training Methodology

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Workshops & Work Presentations
20% Case Studies & Practical Exercises
30% Videos, Software & Simulators

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US$ 17,750 per Delegate + **VAT**. 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	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Principles of Vibration: Vectors, Modulation***
0930 – 0945	*Break*
0945 – 1100	***Principles of Vibration: Phase***
1100 – 1200	***Principles of Vibration: Natural Frequency, Resonance, Critical Speeds***
1200 – 1300	*Lunch*
1300 – 1400	***Principles of Vibration: Force, Response, Damping, Stiffness***
1400 – 1500	***Principles of Vibration: Instabilities, Non-Linear Systems***
1500 – 1515	*Break*
1515 – 1600	***Data Acquisition: Instrumentation***
1600 – 1650	***Data Acquisition: Dynamic Range, Signal-to-Noise Ratio***
1650 – 1700	***Recap***
1700	*End of Day One*

Day 2

0730 – 0830	***Data Acquisition: Test Planning***
0830 – 0930	***Data Acquisition: Test Procedures***
0930 – 0945	*Break*
0945 – 1100	***Signal Processing: R.m.s./Peak Detection***
1100 – 1200	***Signal Processing: Analogue/Digital Conversion***
1200 – 1300	*Lunch*
1300 – 1400	***Signal Processing: Analogue Sampling, Digital Sampling***
1400 – 1500	***Signal Processing: FFT Computation***
1500 – 1515	*Break*
1515 – 1600	***Signal Processing: Filters: Low Pass, High Pass, Band Pass, Tracking***
1600 – 1650	***Signal Processing: Anti-aliasing***
1650 – 1700	***Recap***
1700	*End of Day Two*

Day 3

0730 – 0830	***Signal Processing: Bandwidth, Resolution***
0830 – 0930	***Signal Processing: Noise Reduction***
0930 – 0945	*Break*
0945 – 1100	***Signal Processing: Averaging: Linear, Synchronous Time, Exponential***

1100 – 1200	***Signal Processing: Dynamic Range***
1200 – 1300	*Lunch*
1300 – 1400	***Signal Processing: Signal-to-Noise Ratio***
1400 – 1500	***Signal Processing: Spectral Maps***
1500 – 1515	*Break*
1515 – 1600	***Condition Monitoring: Monitoring Programme Design***
1600 – 1650	***Condition Monitoring: Alternative Technologies - Oil Analysis, Infrared Thermography, Motor Current Analysis and Acoustic Emission***
1650 – 1700	***Recap***
1700	*End of Day Three*

Day 4

0730 – 0930	***Fault Analysis: Spectrum Analysis, Harmonics, Sidebands***
0930 – 0945	*Break*
0945 – 1100	***Fault Analysis: Time Waveform Analysis***
1100 – 1200	***Fault Analysis: Phase Analysis***
1200 – 1300	*Lunch*
1300 – 1400	***Fault Analysis: Transient Analysis***
1400 – 1500	***Fault Analysis: Orbit Analysis***
1500 – 1515	*Break*
1515 – 1600	***Fault Analysis: Shaft Centreline Analysis***
1600 – 1650	***Fault Analysis: Enveloping***
1650 – 1700	***Recap***
1700	*End of Day Four*

Day 5

0730 – 0930	***Fault Analysis: Rubs, Instabilities***
0930 – 0945	*Break*
0945 – 1100	***Fault Analysis: Electric Motor Defects***
1100 – 1200	***Fault Analysis: Flow Induced Vibration, Aerodynamics & Liquids***
1200 – 1300	*Lunch*
1300 – 1400	***Fault Analysis: Resonance & Critical Speeds***
1400 – 1500	***Fault Analysis: Turbomachinery***
1500 – 1515	*Break*
1515 – 1600	***Corrective Action: Field Balancing***
1600 – 1650	***Corrective Action: Flow Control***
1650 – 1700	***Recap***
1700	*End of Day Five*

Day 6

0730 – 0930	***Corrective Action: Isolation & Damping***
0930 – 0945	*Break*
0945 – 1100	***Corrective Action: Resonance Control***
1100 – 1200	***Equipment Testing & Diagnostics: Impact Testing***
1200 – 1300	*Lunch*
1300 – 1400	***Equipment Testing & Diagnostics: Forced Response Testing***
1400 – 1500	***Equipment Testing & Diagnostics: Transient Analysis***

1500 – 1515	*Break*
1515 – 1600	***Equipment Testing & Diagnostics: Transfer Functions***
1600 – 1650	***Equipment Testing & Diagnostics: Damping Evaluation***
1650 – 1700	***Recap***
1700	*End of Day Six*

Day 7

0730 – 0930	***Equipment Testing & Diagnostics: Cross Channel Phase, Coherence***
0930 – 0945	*Break*
0945 – 1100	***Equipment Testing & Diagnostics: Operating Deflection Shapes***
1100 – 1200	***Equipment Testing & Diagnostics: Modal Analysis***
1200 – 1300	*Lunch*
1300 – 1400	***Equipment Testing & Diagnostics: Torsional Vibration***
1400 – 1500	***Reference Standards: ISO***
1500 – 1515	*Break*
1515 – 1600	***Reference Standards: IEC***
1600 – 1650	***Reference Standards: Relevant National Standards***
1650 – 1700	***Recap***
1700	*End of Day Seven*

Day 8

0730 – 0930	***Reporting & Documentation: Vibration Diagnostics Reports***
0930 – 0945	*Break*
0945 – 1100	***Fault Severity Determination: Spectrum Analysis***
1100 – 1200	***Fault Severity Determination: Time Waveform Analysis, Orbit Analysis***
1200 – 1300	*Lunch*
1300 – 1400	***Fault Severity Determination: Severity Charts, Graphs & Formula***
1400 – 1500	***Rotor/Bearing Dynamics: Rotor Characteristics***
1500 – 1515	*Break*
1515 – 1600	***Rotor/Bearing Dynamics: Bearing Characteristics***
1600 – 1650	***Rotor/Bearing Dynamics: Rotor Balancing***
1650 – 1700	***Recap***
1700	*End of Day Eight*

Day 9

0730 – 0945	***Review & MOCK EXAM***
0945 – 1000	*Break*
1000 – 1500	***Mobius COMPETENCY EXAM (5 hrs)***
1500 – 1600	*Lunch*
1600 – 1615	***Course Conclusion***
1615 – 1630	*Presentation of Course Certificates*
1630	*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 the state-of-the-art simulator "iLearnVibration".

iLearnVibration Simulator

Course Coordinator

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