# COURSE OVERVIEW RE0803
# ISO Vibration Certification Level II (CAT II-ISO 18436-2) Training, Exam & Certification (Mobius Institute)

## Course Title

ISO Vibration Certification Level II (CAT II-ISO 18436-2)
Training, Exam & Certification (Mobius Institute)

## Course Date/Venue

Session 1: August 11-15, 2024/Club B Meeting Room, Ramada Plaza by Wyndham Istanbul City Center, Istanbul, Turkey
Session 2: November 10-14, 202/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

## Course Reference

RE0803


## Course Duration/Credits

Four days/2.4 CEUs/24 PDHs
Training: Four days
Exam: One day

## 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 is designed to provide participants with a detailed and up-to-date overview of ISO Vibration Level II in accordance with ISO 18436-2. It covers the maintenance practice and condition monitoring techniques; the principles of vibration, data acquisition and transducer types of non-contact displacement; the proximity probes, velocity sensors and accelerometers covering transducer selection, transducer mounting and natural frequency and measurement point selection; and the following routes and test planning, common measurement errors and signal processing.

During this interactive course, participants will learn the vibration analysis, spectrum analysis, time waveform analysis, orbit analysis, phase analysis and enveloping; the fault analysis, equipment testing and diagnostics, impact testing, bump test and phase analysis; the corrective action for general maintenance repair activities, balancing process and shaft alignment procedures; running a successful condition monitoring program; and acceptance testing and ISO standards review.

## Course Objectives

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

- Get certified as a "*Vibration Analyst: Category II*" in accordance with ISO 18436 standards from Mobius Institute
- Review maintenance practice and condition monitoring techniques
- Discuss the principles of vibration covering complete review of basics, waveform, spectrum (FFT), phase and orbits and modulation, beating and sum/difference of signals
- Carryout data acquisition and identify the transducer types of non-contact displacement
- Discuss proximity probes, velocity sensors and accelerometers covering transducer selection, transducer mounting & natural frequency and measurement point selection
- Apply following routes and test planning and avoid common measurement errors
- Employ signal processing and identify the low pass, band pass, high pass and band stop filters
- Illustrate sampling, aliasing, dynamic range, resolution, Fmax and data collection time
- Describe linear, overlap, peak hold and time synchronous averaging as well as windowing and leakage
- Carryout vibration analysis, spectrum analysis, time waveform analysis, orbit analysis, phase analysis and enveloping
- Apply fault analysis, equipment testing and diagnostics, impact testing, bump test and phase analysis
- Employ corrective action for general maintenance repair activities, balancing process and shaft alignment procedures
- Run a successful condition monitoring program, apply acceptance testing and review ISO standards

## Who Should Attend

This course provides an overview of all significant aspects and considerations of ISO Vibration Analysis Category II for those who have mastered the basics but need to be able to take a good data and decide how the data collector should be set up. This includes maintenance, reliability, rotating equipment, process, control and instrumentation personnel, engineers, maintenance supervisors, mechanical foremen, specialists and other technical staff.

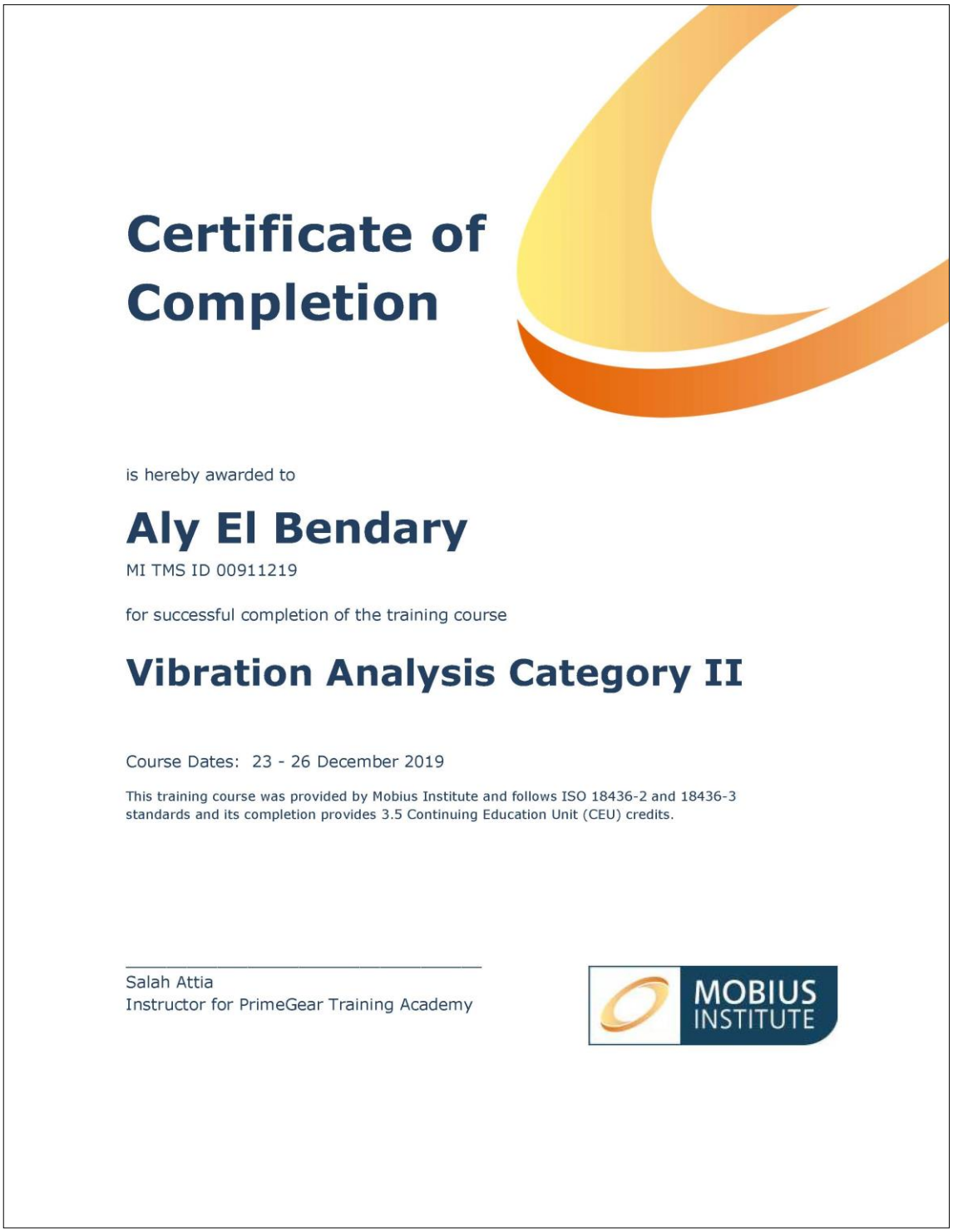
## Exam Eligibility & Structure

Exam candidates shall have the following minimum prerequisites:-

- At least Secondary School Graduation Diploma or its equivalent
- Minimum 18 months of Vibration Analysis experience, verified by an independent person
- Training Course Completed

**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 II

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 II***.

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 18436-2 as

VIBRATION ANALYST: CATEGORY II

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 |
|---|---|---|---|---|
| RE0803-IH | ISO Vibration Certification Level II (CAT II-ISO 18436-2) *Training, Exam & 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

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## 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 **2.4 CEUs** (Continuing Education Units) or **24 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.

## Course Fee

**US$ 7,000** per Delegate + **VAT**. This rate includes Participants Pack (Folder, Manual, Hand-outs, etc.), 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 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. Riyadh Bsiso**, MBA, BSc, ISO-VA, ARP-I, ADNT-NDT, LEEA, is a **Senior Mechanical Engineer** with extensive years of industrial experience within the **Oil & Gas**, **Refinery** and **Petrochemical** industries. His expertise widely covers in the areas of **Machine Reliability**, **Rotating Equipment** Faults & Malfunctions Troubleshooting, **Diagnostic** Techniques, **Vibration** Analysis, **Oil** Analysis, **Boroscopy & Corrective Actions**, Machinery **Balancing**, Machinery **Alignment**, **Vibration** Isolation, Resonance Control, Structural Analysis, **Modal** Testing Techniques, ODS Testing, **Torsional Vibration** Measurements, **Condition Monitoring** Systems, **Machinery** Fault Diagnostics, **Bearing** Technology, Mounting & Dismounting of **Roller Element Bearings** and Machine Diagnostic. He is also well versed in MS Office (Word, Excel, Power Point), AutoCAD, Mechanical Desktop & AutoDesk, Matlab, Ansys, Simulink, Vibration Analysis & Machinery Diagnostics Software - SPM Instruments, GE Scouts, SPM Intellinova, FAG Bearing Analyzer III, Detector III, FAG DetectX1s, FAG ProCheck, FAG Pro Torq, Bearinx - Bearing Calculation Software, ADRETM software (GE Bentley Nevada PL), VB8 – Commtest, and ERP (CRM, Salesforce, Service & Sales Management Modules).

During his career life, Mr. Riyadh has gained his practical and field experience through his various significant positions and dedication as the **Asset Management Specialist**, **Technical Manager**, **Sales & Services Manager**, **Managing Partner**, **Technical/Business Development Manager**, **Mechanical Engineer** - Condition Monitoring & Machine Diagnostic, **Condition Monitoring Engineer** and **Certified Trainer/Instructor** for UPDS, Samir Odeh Engineering Solutions and Schaeffler, just to name a few.

Mr. Riyadh has a **Master's** degree in **Business Administration** (Quality & Innovation Management) from the **University** of **Leicester**, **UK**, a **Bachelor's** degree in **Mechanical Engineering** (**Mechatronics**) and a **Diploma** in **IAM** Engineering Services, Roller Bearing Maintenance & Application Engineering. Further, he is a **Certified Mobius ISO Category I-IV Instructor/Examiner**, **Certified Asset Reliability Practitioner** (**ARP-I**) and has delivered numerous trainings, courses, seminars, conferences and workshops internationally

## 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***

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|---|---|
| *0830 – 0900* | *Registration & Coffee* |
| *0900 – 0915* | *Welcome & Introduction* |
| *0915 – 0930* | ***PRE-TEST*** |
| *0930 – 1030* | ***Review of Maintenance Practices*** |
| *1030 – 1100* | *Break* |
| *1100 – 1200* | ***Review of Condition Monitoring Technologies*** |
| *1200 – 1300* | *Lunch Break* |
| *1300 – 1330* | ***Principles of Vibration***<br>*Complete Review of Basics ● Waveform, Spectrum (FFT), Phase & Orbits ● Understanding Signals: Modulation, Beating, Sum/Difference* |
| *1330 – 1345* | *Break* |
| *1345 – 1550* | ***Data Acquisition***<br>*Transducer Types: Non-Contact Displacement* |
| *1550 – 1600* | ***Recap*** |
| *1600* | *End of Day One* |

***Day 2***

| | |
|---|---|
| *0830 – 0930* | ***Proximity Probes, Velocity Sensors & Accelerometers***<br>*Transducer Selection ● Transducer Mounting & Natural Frequency ● Measurement Point Selection ● Following Routes & Test Planning ● Common Measurement Errors* |
| *0930 – 0945* | *Break* |
| *0945 – 1200* | ***Signal Processing***<br>*Filters: Low Pass, Band Pass, High Pass, Band Stop ● Sampling, Aliasing, Dynamic Range ● Resolution, Fmax, Data Collection Time ● Averaging: Linear, Overlap, Peak Hold, Time Synchronous ● Windowing & Leakage* |
| *1200 – 1300* | *Lunch Break* |
| *1300 – 1430* | ***Vibration Analysis***<br>*Spectrum Analysis ● Time Waveform Analysis (Introduction) ● Orbit Analysis (Introduction)* |
| *1430 – 1445* | *Break* |
| *1445 – 1550* | ***Vibration Analysis (cont'd)***<br>*Phase Analysis: Bubble Diagrams & ODS ● Enveloping (Demodulation), Shock Pulse, Spike Energy, PeakVue* |
| *1550 – 1600* | ***Recap*** |
| *1600* | *End of Day Two* |

**Day 3**

| | |
|---|---|
| 0830 – 0930 | ***Fault Analysis***<br>*Natural Frequencies & Resonances ● Imbalance, Eccentricity & Bent Shaft ● Misalignment, Cocked Bearing & Soft Foot ● Mechanical Looseness ● Rolling Element Bearing Analysis* |
| 0930 – 0945 | *Break* |
| 0945 – 1200 | ***Fault Analysis (cont'd)***<br>*Analysis of Induction Motors ● Analysis of Gears ● Analysis of Belt-Driven Machines ● Analysis of Pumps, Compressor & Fans* |
| 1200 – 1300 | *Lunch Break* |
| 1300 – 1430 | ***Equipment Testing & Diagnostics***<br>*Impact Testing & Bump Tests ● Phase Analysis* |
| 1430 – 1445 | *Break* |
| 1445 – 1550 | ***Corrective Action***<br>*General Maintenance Repair Activities ● Review of the Balancing Process ● Review of Shaft Alignment Procedures* |
| 1550 – 1600 | ***Recap*** |
| 1600 | *End of Day Three* |

**Day 4**

| | |
|---|---|
| 0830 – 0930 | ***Running a Successful Condition Monitoring Program***<br>*Setting Baselines ● Setting Alarms: Band, Envelope/Mask, Statistical ● Setting Goal & Expectations (Avoiding Common Problems)* |
| 0930 – 0945 | *Break* |
| 0945 – 1200 | ***Running a Successful Condition Monitoring Program***<br>*Report Generation ● Reporting Success Stories* |
| 1200 – 1300 | *Lunch Break* |
| 1300 – 1430 | ***Acceptance Testing*** |
| 1430 – 1445 | *Break* |
| 1445 – 1550 | ***Review of ISO Standards*** |
| 1550 – 1600 | ***Recap*** |
| 1600 | *End of Day Four* |

**Day 5**

| | |
|---|---|
| 0830 – 0900 | ***Review*** |
| 0900 – 1200 | ***ISO 18436-2 Category-II Examination*** |
| 1200 – 1215 | *Presentation of Course Certificates* |
| 1215 | *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