



HECO PSG Vibration, Balancing and Alignment Course Outlines

Introduction:

These courses are designed to broaden each participant's knowledge base of vibration analysis to use as a component of their employer's predictive maintenance program. Additionally, for those looking for certifications, these courses prepare individuals for the Vibration Institute (ISO) Category I or II certification examinations.

Prerequisites:

Category I: No previous vibration experience is required to attend this course. However, per ISO requirements, to qualify to take the Cat. I exam, a minimum of 6-months of vibration experience is required.

Category II: HECO Basic Vibration Analysis & Machinery Reliability Cat. I class (or equivalent) is recommended prior to taking this course. In addition, at least 12 months of vibration experience is highly recommended to attend this course. Per ISO requirements, to qualify to take the Cat. II exam, a minimum of 18 months of vibration experience is required.

ISO/ANSI Requirements for Examination:

Starting in 2015, ISO (International Standards Organization) and ANSI (American National Standards Institute) Implemented new requirements for eligibility to take the Category I & II examinations. To see if you meet these new requirements please visit: <https://vi-institute.org/wp-content/uploads/Cert-Handbook.pdf>

Vibration Condition Monitoring and Diagnostics Category I

This introductory course to vibration analysis is designed to provide classroom instruction for maintenance personnel and managers who are responsible for machine reliability with their employer. This course will provide technical definitions of vibration terminology, introduction of vibration and analysis theory, instruction on proper vibration data collection techniques and recognition of quality readings. This course is intended to provide introductory knowledge and prepare attendees for the Vibration Analysis Category I Certification Exam. The exam is optional at the end of the course. This class meets the classification requirements of 30 hours instruction and workshop for Cat. I certification via 8 hour days, Monday-Thursday. For those requiring the exam, testing takes place Friday mornings.

Vibration Condition Monitoring and Diagnostics Category II

This course builds off the introductory Cat. I knowledge base to extend reliability personnel's knowledge and understanding of vibration analysis. This course goes deeper into vibration analysis and data collector set up. New topics such as signal processing, fault analysis and the basics of single plane balancing will be discussed as well as conversion of measurements, analysis techniques and machine condition evaluation. This course is intended to provide knowledge and prepare attendees for the Vibration Analysis Category II Certification Exam. The exam is optional at the end of the course. This class meets the classification requirements of 38 hours instruction and workshop for Cat. II certification via 8 hour days, Monday-Thursday and 4 hours Friday morning. For those requiring the exam, testing takes place Friday afternoon.

VIBRATION COURSE TOPICS

Reliability Based Maintenance
 Introduction to Vibration Analysis Based Predictive Maintenance for Rotating Machinery
 Vibration Measurement Parameters (Amplitude, Frequency)
 Vibration Diagnostic Plots (Trend, time waveform, frequency (FFT) spectrum)
 Vibration Sensors (Types of sensors, sensor selection, mounting requirements)
 Vibration Instrumentation and Monitors
 Diagnosis of: Anti-friction (ball and roller) Bearing Defects
 Natural Frequency, Resonance, and Critical Speed Testing
 Condition Assessment and Vibration Standards
 Diagnosis of Imbalance and Rotor Balancing Procedures
 Detection of Misalignment and Shaft Alignment Procedures
 Diagnosis of Mechanical Looseness
 Vibration Analysis of Gearboxes
 Analysis of Vibration on Electric Motors
 Analysis of Vibration on Pumps, Fans and Compressors
 Vibration Analysis Procedures on Special Machines

Basics of Balancing and Alignment

This is an introductory course of balancing and alignment. Causes and resulting conditions of imbalance and misalignment will be discussed. Various tools and techniques will be presented as well as industry standards of balance and alignment will be explained.

The balancing portion will describe proper recognition of imbalance, single plane and multi-plane corrective actions, unusual conditions that do not follow conventional balancing theories and next step instructions. The alignment portion will describe proper recognition of misalignment, the geometry of alignment and corrective actions. This is an intense 16-hour course intended to provide theory and application to maintenance personnel. There will be a comprehension exam at the end of the class and all attendees will receive a Balancing and Alignment Certificate of Completion presented by HECO PSG. There are not any prerequisites to attend this course.

Requests for any additional information about this course should be directed to psgtraining@hecoinc.com.

Location: HECO PSG Training Room
 630 Gibson Street
 Kalamazoo, M 49007

Offsites are available as needed. Request a quote if desired.

Fees: Cover classroom lecture, study materials and includes food and beverages
 for breaks and lunch each day

You will be required to fill out a form (CF009) stating you meet the experience requirements as indicated on the webpage listed above prior to taking the examination and must be submitted 15 business prior to start of the class. If you apply for the examination (and pay) and then do not meet the requirements as indicated, the testing fee will not be refunded.

HECO Predictive Service Group, LLC

3509 South Burdick Street | Kalamazoo, MI | 49001

Phone: 269-381-7200 | **24Hr Emergency:** 1-800-432-2645 | **Fax:** 269-381-0099

Registration, CF009 Form, & payment must be received 15 days prior to class date

Name: _____ Company: _____

Phone: _____ Email: _____

Registering for: *(Check all that apply)*

| |
|---|
| Vibration Condition Monitoring and Diagnostics Category I |
| December 4-7, 2023 (optional VI Exam will be administered on the 8th) |
| May 6-9, 2024 (optional VI Exam will be administered on the 10th) |

| |
|--|
| Vibration Condition Monitoring and Diagnostics Category II |
| February 5-9 2024 (optional VI Exam will be administered on the 9th) |
| December 9-13 2024 (optional VI Exam will be administered on the 13th) |

| |
|--|
| Balancing and Alignment Certification |
| March 6-7 2024 |

| |
|--------------------------------------|
| Off-site Classes upon request |
| As required by customers |
| |
| |
| |

| | | |
|-------------------------------------|--------------|-----------------|
| Cat I 4 day Class | \$1400 | Location: _____ |
| Cat I Exam (Friday morning) | \$400 | |
| Cat II 4.5 day Class | \$1700 | |
| Cat II Exam (Friday afternoon) | \$450 | |
| Balancing and Alignment 2 day Class | \$700 | |
| Off-site Class | As quoted \$ | |
| Off-site Exam | As quoted \$ | |
| TOTAL: | \$ | |

Method of Payment:

Check* Credit Card (VISA, M/C, AE) Purchase Order (Please Attach)

Credit Card Payments:

| | | |
|------------------|-----------------------|----------------------|
| Name: | Card #: | Exp. Date: |
| Billing Address: | Authorized Signature: | Total Authorized: \$ |

Please Mail Registration Form (with payment) for EACH ATTENDEE to:

HECO PSG
 Attn: Vince Aldrich
 3509 South Burdick St.
 Kalamazoo, MI, 49001

OR via email: psgtraining@hecoinc.com

**Make checks & Purchase Orders payable to: HECO Predictive Service Group, LLC*

***All Credit cards will be charged the first week of the course with emailed receipts to the email shown above.*