

Scandinavian Academy
Training Center

Mobile | 00966536473335 : Mobile | 00966112695229 : Phone : 00966552365295
Email | info.en@scandinavianacademy.co Web site:https://scandinavianacademy.co/en :
Riyadh - Al Khaleej District - Sheikh Abdul Aziz Bin Abdul Rahman Bin Bishr Street - 13223 - Office No. 5 | P.O.BOX : 13224

Course: Advanced Vibration Analysis

Code	City	hotel	Start	End	price	Language - Hours
CM-361SA	Al Khobar	Hotel Meeting	2027-06-06	2027-06-10	12950 SR	En - 25

Introduction

An application oriented programme for industry, which aims to convey the latest thinking and best practice of machinery vibration monitoring and analysis via lectures and case studies. Industrial case study examples are used throughout the programme to emphasise key points and to underline the relevance and applicability of the topics being addressed.

The programme gives a detailed treatment of the detection, location and diagnosis of faults in rotating and reciprocating machinery, using vibration analysis.

Objectives

Participants attending the programme will:

- Have a detailed understanding of the measurement and characteristics of vibration signals, and the ways in which vibration data can be stored and represented.
- Have acquired a knowledge of vibration-based fault detection and diagnostic techniques, and the practical implementation of these techniques.
- Have the knowledge to assess accurately machinery conditions, and to make detailed and reliable diagnoses for a range of common machinery and component types.

Training Methodology

Participants will learn by active participation during the programme through the use of

programme materials, software demonstrations, hands-on experience of vibration analysis software tools, group exercises, and discussions of “real life” case studies in their organisations.

Who Should Attend?

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Seminar outline

Vibration and its Measurement
• Components of a vibration signal
• Vibration transducers
• Overall and spectral vibration
• Monitoring point location
• Transducer mounting
• Common symptoms
• Time and frequency domains
• Frequency domain instrumentation
• Fast Fourier transforms
• Displacement and proximity probes
• Transducer selection
• Calibration, care and maintenance

Vibration Symptoms of Common Machine Faults
• Looseness issues
• Signal distortion
• Harmonic content
• Inter-harmonics
• Static and dynamic balancing of rigid rotors
• Types of imbalance
• Measurement set-ups
• Single and two-plane balance procedures
• Misalignment
• Distinction between angular and lateral effects
• Case studies

Vibration Based Fault Detection

- Vibration level classification
- ISO standards
- Peak and RMS levels
- Dynamic range
- Use of FFT analysers
- Constant percentage bandwidth spectra
- Automated CPB spectrum comparison
- Spectral zoom
- Case studies

Vibration Based Fault Diagnosis

- Time domain averaging
- Crest factor
- Sampling, digitising and aliasing
- Frequency and phase response
- Band selectable analysis
- RMS and linear averaging
- Real time bandwidth and dynamic range
- Case studie

Fundamentals of Bearing and Gear Vibration

- Calculation of bearing frequencies
- Pulse trains and line spectra
- Loaded element modulation
- Trending fault development
- Gear wear
- Toothmesh harmonics
- Ghost components
- Gear fatigue
- Modulation effects
- Bent shafts and gear misalignment
- Case studies

The Scandinavian Academy for Training Center adopts the latest scientific and professional methodologies in training and human resource development, aiming to enhance the efficiency of individuals and organizations. Training programs are delivered through a comprehensive approach that includes:

- Theoretical lectures supported by PowerPoint presentations and visual materials (videos and short films).
- Scientific evaluation of participants before and after the program to measure progress and knowledge acquisition.
- Brainstorming sessions and practical role-playing to simulate real-life scenarios.
- Case studies tailored to align with the training content and participants work nature.
- Assessment tests conducted at the end of the program to evaluate the achievement of training objectives.

Each participant receives the training material (both theoretical and practical) in printed form and saved on a CD or flash drive. Detailed reports, including attendance records, final results, and overall program evaluations, are also provided.

Training materials are prepared professionally by a team of experts and specialists in various fields. At the end of the program, participants are awarded a professional attendance certificate, signed and accredited by the Scandinavian Academy for Training Center.

Program Timings: 9:00 AM to 2:00 PM

The program includes:

- A daily buffet provided during the sessions to ensure participants comfort.
- A closing ceremony on the final day to distribute certificates and celebrate participants achievements.
- **Note: All prices are exclusive of 15% Value Added Tax (VAT).**

Our Success Partners

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المملكة العربية السعودية - الرياض - حي الخليج - شارع الشيخ عبد العزيز بن عبد الرحمن بن بشر - 13223 - مكتب رقم 5
Riyadh - Al Khaleej District - Sheikh Abdul Aziz Bin Abdul Rahman Bin Bishr Street - 13223 - Office No. 5