

# ALIGNMENT, BALANCING & CORRECTION METHODS OF ROTATING MACHINERY

*"Enhancing Machinery Reliability through Precision Maintenance Techniques"*

## Schedule

Date	Venue	Fees (Face-to-Face)
23 - 24 Jun 2026	Manama, Bahrain	USD 1995 per delegate
15 - 16 Oct 2026	Dubai, UAE	USD 1995 per delegate

► **Available delivery methods:** Face-to-Face & Online Training

## Introduction

Poor alignment and unbalance in rotating machinery are major contributors to equipment failure, energy losses, and increased operational costs. This course provides hands-on guidance and technical expertise in identifying, correcting, and preventing common mechanical issues related to misalignment and unbalance.

Designed for maintenance, reliability, and mechanical professionals, the course introduces best practices, tools, and procedures for achieving optimal alignment and balance in pumps, compressors, turbines, and other rotating equipment—boosting efficiency and prolonging machinery life.

## Objectives

By the end of this course, participants will be able to:

- Understand the principles of alignment and balancing in rotating machinery
- Identify symptoms and root causes of misalignment and unbalance
- Apply corrective techniques using modern tools and instrumentation
- Perform precision alignment and balancing procedures on typical equipment
- Reduce vibration, energy losses, and equipment wear through proactive methods

## Why Attend

- Enhance equipment performance and reduce breakdowns
- Gain hands-on experience with alignment and balancing equipment
- Increase safety, reliability, and efficiency of rotating assets
- Reduce maintenance costs and avoid unplanned shutdowns
- Build technical confidence in diagnosing and correcting machinery issues

## Target Audience

This program is designed for:

- Maintenance engineers and mechanical technicians
- Reliability and condition monitoring professionals
- Rotating equipment specialists and plant engineers
- Supervisors involved in equipment installation and maintenance
- Anyone responsible for machinery performance and uptime

## Individual Benefits

Key competencies that will be developed include:

- Proficiency in alignment tools and vibration diagnostics
- Ability to assess and resolve machinery vibration and misalignment
- Confidence in applying correction procedures to prevent early failure
- Improved troubleshooting of unbalance conditions in rotating systems

## Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Improved operational reliability of rotating machinery
- Reduced equipment downtime and maintenance frequency
- Better root cause identification and problem-solving capability
- Minimized energy loss and mechanical wear across operations
- Enhanced compliance with safety and maintenance best practices

## Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings - Key concepts of alignment, balance, and vibration causes
- Case Studies - Examples of real-world machinery issues and corrections
- Workshops - Practical exercises on aligning and balancing rotating equipment
- Peer Exchange - Discussion of challenges from various industries and plant types
- Tools - Checklists, alignment guides, and balancing procedures

## Course Outline

Detailed 2-Day Course Outline

**Training Hours: 7:30 AM - 3:30 PM** Daily Format: 3-4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 - 02:00

### Day 1: Principles and Diagnosis

- **Module 1: Introduction to Rotating Machinery Dynamics (07:30 - 09:30)** • Overview of rotating components: shafts, bearings, couplings • Dynamic behavior and failure modes of rotating systems • Signs and effects of poor alignment and unbalance
- **Module 2: Machinery Alignment - Concepts and Tools (09:45 - 11:15)** • Types of misalignment: angular, parallel, thermal growth effects • Measurement techniques: dial indicators, laser alignment tools • Soft foot and other mechanical conditions affecting alignment
- **Module 3: Performing Precision Alignment (11:30 - 01:00)** • Step-by-step shaft alignment procedures • Shim adjustments and coupling corrections • Live demo or video tutorial on alignment process
- **Module 4: Hands-On Workshop: Shaft Alignment (02:00 - 03:30)** • Team-based alignment task using mock-up or virtual simulator • Troubleshooting misalignment challenges • Interpretation of measurement data and corrective actions

### Day 2: Balancing Techniques and Field Applications

- **Module 1: Understanding Machinery Unbalance (07:30 - 09:30)** • Types of unbalance: static, couple, dynamic • Causes of unbalance and how it affects machine vibration • Signs, diagnosis, and vibration analysis indicators
- **Module 2: Balancing Methods and Equipment (09:45 - 11:15)** • Field vs. shop balancing • Balancing instruments and rotor correction techniques • ISO balance quality grades and tolerances
- **Module 3: Correction of Unbalance and Case Review (11:30 - 01:00)** • Procedures for single- and two-plane balancing • Weight placement and trial weight methods • Examples of successful field balancing corrections
- **Module 4: Final Group Exercise & Course Recap (02:00 - 03:30)** • Group balancing case: interpreting vibration data and applying corrections • Interactive Q&A and knowledge check • Wrap-up discussion and certificate presentation

## Certification

Participants will receive a Certificate of Completion in Rotating Machinery Alignment & Balancing Techniques, validating their skills in precision maintenance and corrective methods for rotating equipment.

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