Advanced Machinery Lubrication and Bearing Maintenance Training Course



21 - 25 Dec 2026

Cairo

3700 € (Per Person)

Ref: #INM5548_277401

Course Introduction / Overview:

This comprehensive training course provides an in-depth exploration of the principles and practices essential for world-class machinery lubrication and bearing maintenance. In today's competitive industrial landscape, maximizing asset reliability and minimizing downtime are paramount to operational success. This program is meticulously designed to move beyond basic maintenance routines, equipping participants with the advanced knowledge needed to implement a proactive and predictive maintenance strategy. Drawing upon the foundational principles of tribology, as detailed by pioneers like Ernest Rabinowicz in his seminal work "Friction and Wear of Materials", the course delves into the science behind lubrication, lubricant analysis, and bearing failure modes. Participants will gain a profound understanding of how to select the correct lubricant for any application, control contamination, and diagnose issues before they lead to catastrophic failures. At BIG BEN Training Center, we are committed to transforming your maintenance team from a reactive force into a strategic asset, capable of extending equipment life, improving efficiency, and contributing directly to the bottom line through a robust lubrication management program. This course is the definitive guide for any professional seeking to master the art and science of machinery lubrication and bearing care.

Target Audience / This training course is suitable for:

- Maintenance Technicians and Supervisors.
- Reliability Engineers and Specialists.
- Mechanical Engineers and Technicians.
- Plant Managers and Operations Managers.
- Lubrication Engineers and Technicians.
- Condition Monitoring Specialists.
- Maintenance Planners and Schedulers.
- Industrial Mechanics and Millwrights.
- Asset Management Professionals.
- Predictive Maintenance Technicians.

Target Sectors and Industries:

- Manufacturing and Production Facilities.
- Oil and Gas Exploration and Refining.
- Power Generation and Utilities.
- Mining and Mineral Processing.
- Heavy Equipment and Construction.
- Transportation and Fleet Management.
- Pharmaceutical and Food Processing.
- Pulp and Paper Manufacturing.
- Government Agencies and Public Works Departments.
- Aerospace and Automotive Industries.

Target Organizations Departments:

- Maintenance and Reliability Departments.
- Engineering and Technical Services.
- Plant and Facility Operations.
- Asset Management and Integrity.
- Production and Manufacturing Units.
- Quality Assurance and Control.
- Health, Safety, and Environment (HSE).
- Procurement and Supply Chain.

Course Offerings:

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

- Master the fundamental principles of tribology and lubrication.
- Select the appropriate lubricant for various industrial applications based on operating conditions.
- Develop and implement an effective lubricant storage and handling program.
- Establish a robust contamination control strategy to protect machinery.
- Perform accurate oil sampling and interpret oil analysis reports for predictive maintenance.
- Identify various bearing types and their specific lubrication requirements.
- Execute proper bearing installation, mounting, and dismounting procedures.
- Conduct root cause analysis for common bearing and lubrication-related failures.
- Utilize advanced condition monitoring techniques like vibration analysis and thermography.
- Design and manage a world-class lubrication management program for enhanced asset reliability.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, engaging, and practical, ensuring that participants can immediately apply their new skills in the workplace. We believe that adult learning is most effective when it combines theoretical knowledge with hands-on application. The course will utilize a blend of expert-led presentations, detailed case studies from various industries, and interactive group discussions to foster collaborative problem-solving. Participants will analyze real-world bearing failures and lubrication challenges, working in teams to develop effective solutions. Practical workshops and demonstrations will provide a tangible understanding of techniques such as proper grease application, oil sampling, and bearing inspection. The instructor will facilitate open forums for Q&A, encouraging participants to share their own experiences and challenges. Continuous feedback and guided practice are integrated throughout the five days to reinforce learning and build confidence. This immersive approach ensures a comprehensive understanding of both the "why" and the "how" of advanced lubrication and bearing maintenance.

Course Agenda (Course Units):

Unit One: Fundamentals of Tribology and Lubrication

- Introduction to tribology, friction, wear, and lubrication.
- Functions and properties of lubricants.
- Understanding viscosity and the viscosity index.
- Base oils, mineral versus synthetic.
- Lubricant additives and their functions.
- Fundamentals of hydrodynamic and boundary lubrication.
- Reading and understanding lubricant technical data sheets.

Unit Two: Lubricant Selection and Grease Technology

- Principles of lubricant selection for industrial machinery.
- Understanding rolling element bearings and their components.
- Grease composition, thickeners, and properties.
- Grease compatibility and mixing guidelines.
- Calculating grease quantity and re-lubrication intervals.
- Advanced grease application techniques and tools.
- Selecting lubricants for gears, hydraulics, and compressors.

Unit Three: Contamination Control and Lubricant Handling

- Sources of lubricant contamination, solid particles, water, and air.
- The impact of contamination on machine reliability.
- ISO 4406 cleanliness codes and setting targets.
- Filtration methods and filter selection.
- Best practices for lubricant storage, handling, and dispensing.
- Designing and managing a clean and organized lube room.
- Oil sampling techniques for accurate analysis.

Unit Four: Bearing Maintenance and Failure Analysis

- Proper bearing handling, storage, and preservation.
- Bearing mounting and installation techniques.
- The importance of precision shaft alignment and balancing.
- Bearing removal and dismounting procedures.
- Common modes of bearing failure and visual identification.
- Introduction to root cause bearing failure analysis (RCBFA).
- Documenting failures and implementing corrective actions.

Unit Five: Condition Monitoring and Program Management

- Introduction to oil analysis for machinery health.
- Interpreting key oil analysis report parameters.
- Using vibration analysis to detect bearing faults.
- Introduction to infrared thermography and acoustic analysis.
- Developing a comprehensive lubrication schedule.
- Key performance indicators (KPIs) for a lubrication program.
- Building a business case for a world-class lubrication management program.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

Beyond extending component life, how can a world-class lubrication program be leveraged as a strategic tool for achieving broader corporate sustainability and energy efficiency goals?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by offering a holistic and strategic perspective on lubrication and bearing maintenance, moving far beyond the conventional focus on product selection and application schedules. While other programs may concentrate on isolated tasks, this training integrates the science of tribology with the practical realities of industrial asset management. It uniquely emphasizes the development of a proactive, reliability-centered culture, teaching participants not just how to lubricate a machine, but how to build and manage a comprehensive lubrication program that prevents failures before they occur. A significant portion of the curriculum is dedicated to advanced diagnostics, including root cause bearing failure analysis and the interpretation of complex oil analysis data, empowering attendees to become expert problem-solvers. The course content is grounded in established engineering principles and avoids reliance on specific brands or tools, focusing instead on universal best practices. By connecting lubrication excellence to broader business objectives like operational efficiency, cost reduction, and plant safety, it equips professionals to articulate the value of their work in a language that management understands, transforming them from technicians into strategic reliability leaders.