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MAINTENANCE AND ENGINEERING | ME-006

AC Electrical Motors and Drives

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Course content

Why Attend

Why Attend AC motors and Variable Frequency Drives (VFDs) are essential components in modern industrial facilities, providing efficient control of pumps, compressors, fans, conveyors, and other critical equipment. This course equips participants with the knowledge and practical skills required to select, operate, maintain, troubleshoot, and protect AC motors and drive systems while incorporating modern diagnostic technologies and AI-enabled predictive maintenance techniques.

Course Methodology The course combines technical presentations, practical workshops, equipment demonstrations, troubleshooting exercises, case studies, diagnostic testing activities, and real-world industrial applications.

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

- Understand the operating principles of AC motors and drive systems
- Select appropriate motors and VFDs for industrial applications
- Perform effective troubleshooting and preventive maintenance activities
- Configure and optimize Variable Frequency Drives for reliable operation
- Apply modern diagnostic tools and predictive maintenance techniques
- Understand motor and drive protection systems and fault prevention methods
- Improve equipment reliability, efficiency, and operational safety

Target Audience

- Electrical engineers
- Electrical maintenance engineers and technicians
- Instrumentation and control engineers
- Reliability engineers
- Plant maintenance supervisors
- Operations engineers

Course content

Target Audience

• Industrial automation professionals

Target Competencies

• AC motor technology

• Variable Frequency Drives (VFDs)

• Electrical troubleshooting

• Predictive maintenance

• Motor protection systems

• Industrial automation

• Electrical diagnostics

• Equipment reliability

Course outline

Day 1: Fundamentals of AC Motors and Industrial Applications

• Understanding the operating principles of rotating electrical machines and AC motors

• Reviewing the construction, characteristics, and performance of three-phase induction motors

• Understanding torque-speed characteristics, rotor slip, and motor operating behavior

• Evaluating motor starting methods and acceleration techniques for industrial applications

• Identifying speed control requirements and motor performance considerations

• Selecting AC motors based on application requirements, operating conditions, and service factors

• Reviewing medium-voltage motor applications in industrial facilities

Day 2: Motor Maintenance, Diagnostics, and Troubleshooting

• Understanding motor operating characteristics, enclosure types, and cooling methods

Course content

Course outline

• Applying preventive and predictive maintenance strategies to improve motor reliability

• Performing diagnostic testing and condition monitoring for AC motors

• Troubleshooting common motor faults including starting failures, overheating, excessive vibration, and abnormal noise

• Utilizing modern testing instruments for electrical and mechanical diagnostics

• Exploring artificial intelligence applications for predictive maintenance and equipment health monitoring

Day 3: Variable Frequency Drives and Speed Control

• Understanding the principles and operation of AC Variable Frequency Drives (VFDs)

• Reviewing power electronic devices used in industrial drive systems

• Understanding inverter technologies, pulse width modulation, and speed control methods

• Evaluating the operational benefits and industrial applications of VFDs

• Applying motor control strategies for energy efficiency and process optimization

• Understanding regenerative braking, harmonic distortion, switching transients, and power factor considerations

• Reviewing medium-voltage drive applications and system integration principles

Day 4: Advanced Drive Maintenance and Performance Optimization

• Applying artificial intelligence and digital technologies to VFD monitoring and maintenance

• Diagnosing faults within converters, rectifiers, and inverter sections of VFD systems

• Performing structured troubleshooting and corrective maintenance procedures

• Configuring VFD parameters to optimize equipment performance and reliability

• Understanding bearing failure mechanisms associated with variable speed drives and implementing preventive measures

• Utilizing advanced diagnostic instruments, analyzers, and oscilloscopes for drive testing and performance evaluation

Course content

Course outline

Day 5: Protection of Motors and Drive Systems

• Understanding the importance of protecting motors and electronic drive systems

• Reviewing overload protection principles and motor protection relay characteristics

• Applying numerical protection relays and intelligent protection systems

• Protecting inverters, converters, and associated electronic equipment from electrical faults

• Developing integrated motor and drive protection strategies for industrial applications

• Practical workshop: Selecting motors, VFDs, and protection systems based on operational requirements and fault scenarios

• Course review, lessons learned, and final Q&A session

Seminar dates

Available seminar dates

Live dates and pricing for AC Electrical Motors and Drives generated from the course details page.

Date	Location	Format	Fee
4 - 8 January 2027	Amsterdam - Netherlands	Classroom	**€3,040.-**
1 - 5 February 2027	Geneva - Switzerland	Classroom	**€4,200.-**
1 - 5 March 2027	Barcelona - Spain	Classroom	**€3,080.-**
5 - 9 April 2027	London - U.K	Classroom	**€3,360.-**
3 - 7 May 2027	Barcelona - Spain	Classroom	**€3,080.-**
7 - 11 June 2027	Istanbul - Turkey	Classroom	**€2,280.-**
5 - 9 July 2027	Madrid - Spain	Classroom	**€3,400.-**
2 - 6 August 2027	Istanbul - Turkey	Classroom	**€2,280.-**
6 - 10 September 2027	Paris - France	Classroom	**€3,600.-**
4 - 8 October 2027	Barcelona - Spain	Classroom	**€3,080.-**
1 - 5 November 2027	Munich - Germany	Classroom	**€3,400.-**
6 - 10 December 2027	Kuala lumpur - Malaysia	Classroom	**€1,800.-**

Live online option Online delivery is available at €1,850.-.