OFFICE OF CONSULTATION & TRAINING
College of Engineering and Petroleum

Kuwait University- College of Engineering & Petroleum - Mechanical Engineering – OCT

ME0023- Pumps Types, Operation, and Maintenance

Contact

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Training course duration:

Five Days

Timing:

8 a.m. - 2 p.m. Daily

Course objectives:

The objectives of this training course are to provide participants with a comprehensive understanding of pump technology, covering fundamental principles, diverse pump types, and their applications across various industries. It aims to equip attendees with the knowledge needed to select appropriate pumps based on system requirements and performance characteristics, while also emphasizing efficient operation, routine maintenance, and troubleshooting techniques. Additionally, the course seeks to instill awareness of critical safety protocols, environmental considerations, and energy-efficient practices, ensuring that participants can manage pump systems reliably, sustainably, and safely in their professional roles.

Course outline :

Day One Topics:

Introduction to Pumps:
• Definition and basic function of pumps.
• Importance of pumps in various industries.
• Historical development of pumps.
Types of Pumps:
• Centrifugal Pumps:
- Principles of operation.
- Different types (single-stage, multi-stage, axial flow, radial flow).
- Applications and limitations.
• Positive Displacement Pumps:

- Types (reciprocating, rotary).
- Working principles.
- Applications and considerations.
• Specialized Pumps:
- Diaphragm pumps, peristaltic pumps, gear pumps, etc.
- When and where to use specialized pumps.

Day Two Topics:

Pump System Components:
• Impellers and Casings:
- Design considerations.
- Materials used.
• Seals and Bearings:
- Types of seals.
- Bearing types and maintenance.
• Drive Systems:
- Direct drive vs. belt drive.
- Couplings and alignment

Day three topics:

Pump Performance and Selection:
• Performance Curves:
- Understanding pump curves.
- System curves and operating points.
• Efficiency and NPSH:
- Factors affecting pump efficiency.
- Net Positive Suction Head (NPSH) and its importance.
• Pump Selection Criteria:
- Matching pump characteristics to system requirements.
- Factors influencing pump selection.

Day Four topics:

Pump Operation and Maintenance:
• Start-up and Shutdown Procedures:
- Best practices for starting and stopping pumps.
- Importance of gradual changes in flow rates.
• Monitoring and Troubleshooting:
- Vibration analysis.
- Temperature and pressure monitoring.
- Common pump issues and troubleshooting.
• Preventive Maintenance:
- Lubrication.
- Inspection schedules.
- Predictive maintenance techniques.

Day Five topics:

Safety Considerations:
• Hazards and Precautions:
- Mechanical hazards.
- Electrical safety.
- Chemical exposure.
• Emergency Procedures:
- Response to pump failures.
- Contingency plans.
Environmental and Energy Considerations:
• Sustainable pump practices.
• Energy-efficient pump systems.
Closing Remarks and Answering Questions:
• Closing remarks
• Q and A

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Instructor:

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