# Artificial Lift Systems: Design, Operations, and Optimization in Oil Production

## Course general description:

This intensive 5-day training course provides comprehensive coverage of artificial lift systems used in oil and gas production operations. Participants will gain in-depth knowledge of various lift technologies, their applications, design considerations, troubleshooting, and optimization strategies. The course combines theoretical concepts with practical case studies and hands-on exercises to ensure thorough understanding of artificial lift operations.

## Audience:

This course is designed for:

1. Production Engineers
2. Petroleum Engineers
3. Field Operations Personnel
4. Maintenance Engineers
5. Well Intervention Specialists
6. Project Engineers transitioning to production roles
7. Technical Supervisors in oil and gas operations

## Course objectives:

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

1. Evaluate and select appropriate artificial lift methods for different well conditions
2. Design and optimize artificial lift systems for maximum efficiency
3. Troubleshoot common artificial lift problems
4. Analyze production data to optimize lift performance
5. Implement best practices in artificial lift operations
6. Conduct economic analysis of different lift methods

## Course duration:

5 days

## Course location:

Cairo-Dubai-Istanbul

## Course contents:

**Day 1: Fundamentals and Gas Lift Systems**

1. Overview of artificial lift methods, production analysis, and lift selection criteria.
2. Fundamentals of gas lift operations, types, design considerations, and equipment.
3. Gas lift valve operations, installation, unloading sequences, and optimization.

**Day 2: Electrical Submersible Pumps (ESP)**

1. Components of ESP systems: pumps, motors, cables, and surface equipment.
2. Design and selection: well analysis, pump performance, motor sizing, and VFD applications.
3. Operations: installation, startup, performance monitoring, and troubleshooting.

**Day 3: Rod Pump Systems**

1. Fundamentals of sucker rod pumps: components, operation, and design.
2. Analysis techniques: dynamometer usage, rod string design, and efficiency calculations.
3. Maintenance: preventive programs, troubleshooting, and failure analysis.

**Day 4: Progressive Cavity Pumps and Other Lift Methods**

1. PCP systems: components, operating principles, design, and installation.
2. Hydraulic pumping systems: design, operations, and maintenance.
3. Emerging technologies: jet pumps, plunger lifts, hybrid systems, and innovations.

**Day 5: Optimization and Economic Analysis**

1. Review of artificial lift selection criteria and economic comparison.
2. Life cycle cost analysis, case studies, and practical applications.
3. Course summary, evaluation, and lessons learned.
4. final assessment.

**Methodology:**

- 50% lectures & concepts
- 10% Videos
- 15% Case studies
- 15% Exercises
- 10% Discussions

**Course code: (TPTR003)**