Industrial Wastewater Treatment & Management

Course general description:

Comprehensive training on industrial wastewater treatment processes, technologies, and management strategies. Covers theoretical principles, practical applications, and regulatory compliance through hands-on exercises and case studies.

Audience:

This course is designed for:

1. Wastewater treatment plant operators
2. Environmental engineers
3. Process engineers
4. Plant managers
5. Environmental compliance officers
6. Project engineers
7. Maintenance technicians
8. Quality control personnel.

Course objectives:

By end of the course participants will:

1. Master industrial wastewater characterization techniques
2. Design and optimize treatment processes
3. Apply appropriate treatment technologies
4. Ensure regulatory compliance
5. Implement troubleshooting strategies
6. Develop cost-effective management solutions.

Course duration:

5 days

Course location:

Dubai

Course contents:

Day-1

- Pretest
- Overview of wastewater sources, characteristics, sampling techniques, and analysis.
- Examination of physical and chemical parameters and treatment regulations.
- Flow measurement, loading calculations, and preliminary treatment processes.
- Key processes in screening, grit removal, sedimentation, and oil/water separation.
- Principles of coagulation and flocculation in primary treatment systems

Day-2

- Basics of wastewater microbiology and activated sludge systems.
- Control parameters for biological processes and nutrient removal strategies.
- Aerobic and anaerobic treatment systems, including fixed-film and MBR technologies.
- Troubleshooting biological systems and optimizing sludge management.
- Case studies highlighting biological treatment applications

Day-3

- Introduction to chemical and advanced oxidation processes, and ion exchange.
- Overview of membrane technologies, reverse osmosis, and ultrafiltration.
- Techniques for activated carbon adsorption and heavy metal removal.

- Concepts of zero liquid discharge, water reuse, and resource recovery.
- Exploration of emerging technologies for advanced wastewater treatment.

Day-4

- Methods for process monitoring, control, and performance optimization.
- Preventive maintenance, troubleshooting, and chemical handling safety.
- Emergency procedures and strategies for cost optimization.
- Ensuring environmental compliance, documentation, and reporting.
- Establishing effective sampling programs and systems for regulatory reporting.

Day-5

- Analysis of industry-specific case studies in wastewater treatment.
- Economic evaluation and sustainability practices in treatment systems.
- Application of wastewater treatment principles to specific industries.
- Final course assessment and wrap-up discussion.

Methodology:

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

Course code: (TPRS058)