MERCURY

Wastewater Treatment Plant Processing, Operations, and Maintenance

1 – 5 February 2027
Madrid (Spain)



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Wastewater Treatment Plant Processing, Operations, and Maintenance

Ref: 16036_1003676 **Date:** 1 – 5 February 2027 **Location:** Madrid (Spain) **Fees:** 6200 Euro

Introduction:

The Wastewater Treatment Plant Processing, Operations, and Maintenance course provides an in-depth exploration of the processes, technologies, and management strategies essential for effective wastewater treatment. It equips participants with the skills required to operate, monitor, and maintain treatment facilities while ensuring environmental and regulatory compliance. It covers every stage of the wastewater treatment plant process, from influent collection to effluent discharge, with emphasis on operational efficiency and safety.

Participants will learn how to handle primary, secondary, and tertiary treatments, as well as advanced methods used in modern facilities. The Wastewater Treatment Plant Processing, Operations, and Maintenance training course also includes practical insights into process optimization, plant troubleshooting, and preventive maintenance planning. It gives a special focus to wastewater treatment operator training and technical practices that align with industry standards.

Through real-world examples, participants will gain expertise in diagnosing operational issues, implementing corrective actions, and applying sustainable treatment methods. This Wastewater Treatment Plant Processing, Operations, and Maintenance program also introduces innovations in advanced wastewater treatment training, preparing professionals to adapt to evolving technologies. Attendees will manage daily operations and long-term plant maintenance effectively.

Targeted Groups:

This Wastewater Treatment Plant Processing, Operations, and Maintenance training course targets professionals seeking specialized knowledge and skills:

- Wastewater treatment plant operators and technicians.
- Environmental engineers working in the water and wastewater sectors.
- Utility and facility maintenance staff.
- Supervisors and managers oversee wastewater operations.
- Environmental health and safety officers.
- Process engineers and consultants in plant design and optimization.
- Government and municipal staff involved in wastewater management training.
- Professionals pursuing a wastewater plant operator license.
- Specialists seeking career advancement in wastewater plant operations training.
- Technical staff involved in industrial wastewater treatment maintenance training.

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Course Objectives:

Participants will achieve the following objectives by completing the Wastewater Treatment Plant Processing, Operations, and Maintenance course:

- Understand core wastewater treatment plant processes and functions.
- Identify physical, chemical, and biological treatment methods.
- Evaluate influent and effluent characteristics effectively.
- Apply safety measures and environmental compliance protocols.
- Monitor treatment efficiency through data analysis and control systems.
- Diagnose common plant issues and apply structured troubleshooting methods.
- Develop preventive and predictive wastewater treatment maintenance plans.
- Implement energy efficiency and sustainable operations strategies.
- Interpret and apply regulatory standards in plant management.
- Operate pumps, aeration systems, and advanced filtration equipment.
- Design schedules for inspection and equipment longevity.
- Prepare technical reports that meet regulatory expectations.
- Optimize resource utilization to minimize operational costs.
- Utilize SCADA and modern instrumentation for wastewater operator training.
- Apply innovative technologies for plant upgrades and modernization.
- Strengthen decision-making skills in emergencies.

Targeted Competencies:

Participants will gain the following competencies during the Wastewater Treatment Plant Processing, Operations, and Maintenance program:

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- Operate wastewater treatment systems with accuracy.
- Analyze operational and laboratory data.
- Apply effective wastewater treatment plant maintenance training techniques.
- Troubleshoot process disruptions confidently.
- Ensure compliance with safety and discharge regulations.
- Optimize treatment processes using modern control tools.
- Prepare accurate operational and environmental reports.
- Implement strategies to enhance plant efficiency.
- Manage preventive maintenance and reduce downtime.
- Adapt to advanced wastewater treatment training innovations.

Course Content:

Unit 1: Fundamentals of Wastewater Treatment Processes:

- Define wastewater characteristics and pollutant types.
- Explain primary, secondary, and tertiary treatment processes.
- Compare physical, biological, and chemical treatment methods.
- Discuss the significance of sludge handling and processing.
- Study anaerobic and aerobic digestion technologies.
- Review disinfection techniques and oxidation processes.
- Examine screening, grit removal, and sedimentation stages.
- Understand the role of microbial communities in biological treatment.
- Analyze treatment outcomes through laboratory testing.
- Introduce sustainable wastewater management strategies.

Unit 2: Operations and Monitoring of Treatment Facilities:

- Apply process control principles in wastewater treatment plant operations.
- Monitor flow rates, pH levels, and dissolved oxygen.
- Operate pumps, blowers, and screening systems.
- Perform chemical dosing and monitor chemical reactions.
- Conduct regular water quality laboratory tests.
- Use SCADA and remote monitoring systems.
- Adjust treatment operations based on influent variations.
- Ensure effluent discharge meets compliance requirements.
- Record plant operations data accurately.
- Respond to emergency events effectively.
- Manage day-to-day plant operations with efficiency.

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Unit 3: Maintenance Planning and Troubleshooting Techniques:

- Develop preventive maintenance programs for plant reliability.
- Inspect pumps, motors, and valves systematically.
- Apply predictive maintenance for early failure detection.
- Troubleshoot aeration, sludge, and filtration systems.
- Manage maintenance records and spare parts inventory.
- Use diagnostic tools for identifying mechanical faults.
- Apply safety inspections to prevent hazards.
- Resolve operational disruptions quickly.
- Maintain mechanical and electrical components effectively.
- Strengthen skills in wastewater treatment plant maintenance training.
- Ensure maintenance plans reduce long-term costs.

Unit 4: Advanced Wastewater Treatment and Technology Innovations:

- Explore advanced filtration methods such as membranes and reverse osmosis.
- Study nutrient removal and resource recovery systems.
- Apply energy-saving techniques in daily operations.
- Implement smart sensors for real-time monitoring.
- Explore automation in wastewater operations.
- Introduce case studies on successful technology integration.
- Review water reuse and recycling technologies.
- Understand emerging sustainable practices.
- Apply innovations to reduce costs and improve efficiency.
- Integrate digital transformation in plant operations.
- Strengthen knowledge of advanced wastewater treatment training.

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Unit 5: Environmental Compliance and Reporting Requirements:

- Interpret regulatory frameworks governing wastewater discharge.
- Prepare technical compliance reports accurately.
- Develop emergency spill and violation response plans.
- Assess environmental impact and implement mitigation.
- Ensure discharge limits meet municipal and industrial standards.
- Monitor industrial wastewater discharges for compliance.
- Engage in stakeholder communication and community trust.
- Apply public health protection strategies.
- Review global and regional best practices.
- Stay updated on international wastewater standards.
- Strengthen knowledge in wastewater management training.

Final Insights & Key Takeaways:

This wastewater treatment training program equips participants with the technical and managerial expertise needed to excel in plant operations and maintenance. It provides practical strategies for troubleshooting, compliance, and efficiency improvements. The skills learned will enhance environmental protection while ensuring safe and reliable plant performance. Professionals will learn leadership roles in the water treatment sector. This course is a vital step for those seeking certification or advancement in wastewater operator training and plant management.