Water and Wastewater Treatment Plant Design Training Course



16 - 20 Nov 2026

Cairo

3700 € (Per Person)

Ref: #ACE3569_265868

Course Introduction / Overview:

This training course gives a comprehensive look into the principles and practices of designing water and wastewater treatment plants. The global demand for clean water and the need to manage waste responsibly make this field crucial for public health and environmental protection. This course gives participants a solid foundation in the fundamental physical, chemical, and biological processes used in treatment plants, from preliminary screening to advanced disinfection technologies. We cover the entire design process, including flow rate calculations, selection of treatment units, and compliance with regulatory standards. The curriculum is informed by leading academic and industry resources, such as the widely respected work of George Tchobanoglous, Frank Burton, and H. David Stensel, authors of the book Wastewater Engineering: Treatment and Resource Recovery. BIG BEN Training Center is committed to giving a forward-thinking curriculum that equips professionals with the skills needed to create sustainable and efficient water and wastewater treatment solutions for a wide range of applications.

Target Audience / This training course is suitable for:

- Civil and environmental engineers.
- Chemical and process design engineers.
- Water and wastewater treatment plant operators.
- Project managers in the water sector.
- Public health officials and regulators.
- Urban planners and developers.
- Consultants in environmental engineering.

Target Sectors and Industries:

- Water and utilities.
- Municipal and public works.
- Industrial manufacturing.
- Consulting and engineering firms.
- Construction and infrastructure.
- Government agencies and environmental departments.
- Research and development.

Target Organizations Departments:

- Engineering and design.
- Operations and maintenance.
- Environmental compliance.
- Research and development.
- Urban planning.
- Public health.
- Project management.

Course Offerings:

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

- Describe the physical, chemical, and biological processes of water treatment.
- Perform design calculations for treatment plant components.
- Understand and apply regulatory standards for water quality.
- Design and evaluate disinfection and filtration systems.
- Analyze wastewater characteristics and influent loads.
- Select appropriate technologies for different types of wastewaters.
- Integrate sustainability and resource recovery into plant design.
- Develop preliminary design reports for new or upgraded facilities.

Course Methodology:

This training course uses a blend of theoretical instruction, guided exercises, and hands-on projects to ensure a complete understanding of the design process. The training begins with a clear explanation of the scientific principles behind water and wastewater treatment before moving on to practical applications. We use a case study-based approach where participants will analyze real-world design challenges, from municipal treatment plants to industrial facilities. The course includes interactive sessions where participants can discuss design options, compare technologies, and solve problems in a collaborative environment. This approach helps participants see the complete picture, from initial concept to final design. We also give feedback on each participant's work, which helps them improve their skills. At BIG BEN Training Center, we are dedicated to helping professionals master complex engineering tools, and this course is designed to build confidence and competence in applying process design principles to water and wastewater treatment.

Course Agenda (Course Units):

Unit One: Introduction and Preliminary Treatment.

- Overview of water and wastewater treatment.
- Water quality parameters and standards.
- Wastewater characteristics and collection systems.
- Preliminary treatment: screening and grit removal.
- Flow equalization and primary sedimentation.

Unit Two: Biological Treatment Processes.

- Principles of biological wastewater treatment.
- Activated sludge process design.
- Trickling filters and rotating biological contactors.
- Anaerobic treatment and digesters.
- Nutrient removal (N and P) processes.

Unit Three: Physical and Chemical Processes.

- Coagulation and flocculation.
- Sedimentation and filtration.
- Disinfection methods: chlorine, UV, and ozone.
- Chemical precipitation and ion exchange.
- Advanced oxidation processes.

Unit Four: Plant Hydraulics and Sludge Management.

- Hydraulic design of treatment units.
- Pumping stations and head loss calculations.
- Sludge generation and characteristics.
- Sludge thickening and dewatering.
- Sludge stabilization and disposal methods.

Unit Five: Regulatory Compliance and Plant Optimization.

- Environmental regulations and permits.
- Plant layout and site selection.
- Energy efficiency and resource recovery.
- Instrumentation and process control.
- Case study: a comprehensive plant design project.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

In what ways can the principles of a circular economy be fully integrated into the design of future water and wastewater treatment plants to recover energy, nutrients, and clean water?

What unique qualities does this course offer compared to other courses?

This training course is unique because it combines a strong theoretical foundation with practical, hands-on design principles. While some courses may focus on just one aspect, we give a complete overview of the design process for both water and wastewater systems. Our curriculum is not just about what technologies exist, but rather how to choose, size, and integrate them into a complete and functional plant. The course is heavily focused on real-world scenarios and case studies, allowing participants to work through the same kind of problems they would face in a professional setting. This practical approach helps bridge the gap between academic knowledge and on-the-job application. The course also puts a lot of weight on current trends like sustainability, energy efficiency, and resource recovery, which are crucial for the future of the industry.