

## Water Treatment Processes Overview

### Course general description:

Water treatment is a vital process that enhances water quality for various applications such as drinking, industrial use, and irrigation by removing contaminants to meet safety standards. This course will explore the different stages of water treatment, including physical methods, chemical processes. We will also delve into advanced techniques like reverse osmosis, membrane filtration, ion exchange, and adsorption, as well as waste treatment and disposal. Ensuring sustainable and safe water availability is crucial for public health, industrial activities, and ecosystem preservation.

### Audience:

This course is designed for:

1. Operation engineers
2. Environmental engineers
3. Maintenance Engineers
4. Technical and Managerial Staff those seeking to enhance their knowledge in Water treatment.

### Course objectives:

By end of the course participants will gain:

1. Understand the importance and applications of water treatment in various industries.
2. Identify common water contaminants and assess water quality parameters.
3. Explain the principles and techniques of water treatment processes.
4. Evaluate advanced water treatment methods and emerging technologies.
5. Apply practical knowledge through case studies and exercises.

### Course duration:

5 days

### Course location:

Cairo-Dubai-Istanbul

### Course contents:

#### **Day-1**

- Pretest
- Introduction to Water Treatment
- Overview of water treatment processes
- Regulatory standards and guidelines
- Water chemistry concepts
- Water contaminants and quality parameters

#### **Day-2**

- Physical & Chemical Treatment Processes
- Screening and sedimentation
- Filtration techniques
- Flocculation and coagulation
- Chemical dosing and control
- Disinfection methods

#### **Day-3**

- Membrane Technologies
- Basics of membrane filtration
- Reverse osmosis, nanofiltration, ultrafiltration
- Applications and limitations of membrane technologies

- Advanced Water Treatment Techniques

#### **Day-4**

- Operation of Water Treatment Plants
- Equipment Monitoring
- Common Plant Problems & Troubleshooting
- Plant Waste Disposal

#### **Day-5**

- Real-world examples of water treatment plants
- Success stories and challenges faced
- Future trends and innovations in water treatment
- Posttest

#### **Methodology:**

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

**Course code: (TPRS051)**