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# WE028:
# Modern Water Desalination Technologies (RO Desalination)

## Training Description:

Water desalination technologies play a crucial role in socio-economic development in a number of countries in the world. Desalinated water is an essential and often the sole, source of fresh water in several of these countries, and rising living standards and high population growth are likely to render desalination a viable option for many areas of the world. Fresh water is rapidly becoming a scarce resource in many countries around the world. Modern desalination technologies, applied to seawater and brackish water, offer effective alternatives in a variety of circumstances. For some countries in the world particularly in Gulf States they are on the most aired part of the globe and characterized by some of the world's highest population growth rates, would benefit greatly from the adaptation, further development and wider dissemination of desalination technologies.

Large-scale thermal desalination technologies have been in use since the 1950s. The larger desalination plants have provided fresh water supplies for drinking municipal use and agricultural development, particularly in the Gulf States. In the past, high capital costs and heavy energy consumption generally translated into excessive desalinated water costs. However, advances in technology have helped to drastically reduce capital and running costs as well as energy requirements, rendering desalination more viable an option than ever before.

This five-days course is essentially aimed at outlining trends in modern desalination technologies and highlighting the options offered by recent technological advances. The course covers available technologies, proposed design improvements and market potential in the near future. Through case studies, some of their more salient features are examined. Energy demands for both current processes and the newer innovations will be discussed. The course will cover both major processes in water desalination, the thermal and the membrane separation.

## Training Objectives:

By the end of the training, participants will be able to:

- ✓ Apply and gain a basic understanding of thermal desalination processes
- ✓ Perform the role of membrane separation processes
- ✓ Use the basic concepts of desalination economics
- ✓ Understand the strategic issues in desalination technology capacity building
- ✓ Analyze and understand the renewable energy desalination technologies
- ✓ Use the recent trends and expected future developments in water
- ✓ Use the basic concepts of desalination technologies
- ✓ Wastewater collection pumping systems

## Training Designed for:

This course is aimed for Engineers, Scientists and Technologists involved in the planning, management and operation of water desalination systems and also for Manufacturers, Consultants, Designers, Researchers and Water Personnel. This course is also suitable for Water Laboratory Staff including Lab Managers, Chemists, Scientists, Analysts, Technologists and other Lab Technical Staff.

## Training Program:

***DAY ONE:***

- Source of Feed Water
- Water Desalination Main Processes
  - Reveres Osmosis
  - Distillation
  - Ion exchange
  - Electro dialysis
- Filtration Process
  - Micro filtration
  - Ultra filtration
  - Nano filtration
  - Reveres Osmosis

***DAY TWO:***

- Theory of Reverse Osmosis
- Reveres Osmosis Terminology
- Definitions-RO Process
- Factors and Parameters Related to RO Process

***DAY THREE:***

- Membranes
  - Membranes configurations and types
  - Spiral wound membrane
    - Overview
    - Construction
    - Separation
    - Fluid dynamics
- Reverse Osmosis Plant
  - Feed water intake system
  - Pre-treatment system
  - Desalination system
  - Post treatment system
  - Operating data
  - Operating procedures

***DAY FOUR:***

- Troubleshooting
- Fouling
  - Types of fouling
  - How to prevent fouling
- Scaling
  - Nature of scaling
  - Prevention of scale formation

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***DAY FIVE:***

- Chemical Cleaning
  - Timing for cleaning
  - Cleaning system
  - Types of cleaning
  - Cleaning procedure
  - Cleaning chemicals
- Main Equipments & Devises are Using in Water Desalination R.O. Plants:-
  - Pumps, high pressure pump and centrifugal pump
  - Air compressors and pneumatic valves
  - Meters /flow & quantity
  - PH, cond. & ORP devices
- Course Conclusion
- POST- ASSESSMENT and EVALUATION

## Training Requirement:

"Hand's on practical sessions, equipment and software will be applied during the course if required and as per the client's request."

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

## Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

## Training Certificate(s):

Internationally recognized certificate(s) will be issued to each participant who completed the course.

## Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

## Training Timings:

**Daily Timings:**

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|---|---|
| 07:45 - 08:00 | Morning Coffee / Tea |
| 08:00 - 10:00 | First Session |
| 10:00 - 10:20 | Recess (Coffee/Tea/Snacks) |
| 10:20 - 12:20 | Second Session |
| 12:20 - 13:00 | Recess (Prayer Break & Lunch) |
| 13:00 - 14:00 | Last Session |

For training registrations or in-house enquiries, please contact:

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