



## Dr Simon Judd

Maersk Oil Professorial Chair in  
Environmental Engineering,  
Gas Processing Centre  
Qatar University

Simon Judd was Professor in Membrane Technology at Cranfield University for 24 years prior to taking up his current position. He has over 25 years' experience in academic/industrial research and development incorporating all aspects of Water and Wastewater Treatment technology, with an extensive network of contacts within the water industry both nationally and internationally from procuring and/or managing a number of large collaborative R&D programmes. He has published a number of papers based on reverse osmosis and nanofiltration of water and wastewater in peer-reviewed journals, and has co-authored books encompassing the subject.

Prof. Judd has been responsible for the teaching of water chemistry and treatment process technologies relating to pure water on the University's MSc courses Water and Wastewater Technology/Engineering. He has delivered bespoke short courses in water and wastewater treatment across four continents, including courses on desalination in the Gulf. He is a Fellow of the Royal Society of Chemistry and an Associate Fellow of the Institution of Chemical Engineers.

**The Gas Processing Center, Cordially invites you to the Course:**

## DESALINATION

DAY & DATE: February 19-20, 2017

TIME: 8:00 AM to 2:30 PM

VENUE: New Research Complex (H10) Room F101

Course fees: **2500 QAR**

### About the Course:

Desalination of seawater provides the primary source of freshwater throughout the GCC region. Whilst conventionally freshwater has been generated through the use of combination power generation-seawater desalination plants, the increasing regional imbalance of power and water has meant that water demand is starting to outstrip power requirements, such that the less energy-intensive and more efficient reverse osmosis (RO)-based membrane separation process is becoming more favoured. Reverse osmosis also has a key role in the recovery and reuse of wastewater for utility purposes on industrial sites across Qatar where zero liquid discharge (ZLD) conditions have been imposed.

This course aims to instill a knowledge of the principles and methods of design and operation of desalination plants, focusing primarily on membrane technologies applied, along with related water management aspects. Comparison with thermal processes is made, through a consideration of the capital cost elements and primary energy demand. The course includes all the key facets of the reverse osmosis process, including separation principles, fouling indicators and impacts, pretreatment, chemical dosing and final water management. Computer-aided design packages are used to demonstrate key process design and operating principles, along with a number of case studies of established full-scale RO seawater desalination and water reuse plants from around the world.

## Course content

### **Overview of Membrane & Desalination Technology:**

- Membrane separation principles
- Raw water quality for membrane processing

### **Desalination Technologies for Potable Water Production:**

- Dense membrane processes (reverse osmosis, nanofiltration electrodialysis)
- Evaporative processes (multi-stage flash, multiple effect and vapour recompression).

### **Porous Membrane Technologies:**

- Ultrafiltration and microfiltration, as applied to potable water treatment and reverse osmosis pretreatment.

### **Pre-treatment and Fouling Control for Reverse Osmosis:**

- Fouling types (pore plugging, scaling and bacteriological)
- Methods for assessment of pretreatment requirements (fouling and scaling indices)
- Chemical dosing for fouling amelioration
- Membrane cleaning

### **Case Studies:**

- Seawater desalination
- Industrial and municipal effluent recycling.

## **The course will provide an understanding of:**

- the underlying basic governing principles of desalination and other membrane technologies used in water and wastewater treatment, including
  - process operation and maintenance
  - pretreatment
  - post-treatment
- the correct expressions and/or protocols to enable basic design and development of procedures for the operation of desalination and other membrane technologies
- the commercial software used for reverse osmosis arrays

## **Eligibility criteria:**

This course is designed for process scientists and engineers, though competent and numerate process operators may also benefit, involved with water and wastewater treatment operations.

## **Gas Processing Center certificate:**

All the attendee will receive a certificate for attending this training course.

**For more information please contact:**

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