WATER Treatment Academy
www.watertreatment-academy.org

WTA Certification Program

UF/MF Membrane Water Treatment Design & Optimization

23-27 September 2013, Kuala Lumpur, Malaysia

@ Impiana KLCC Hotel Kuala Lumpur

Organized by
Water Treatment Academy

www.watertreatment-academy.org

The Water Treatment Academy (WTA) has joined with Membrane Consultancy Associates Ltd. to provide a comprehensive assessed certification training program on UF/MF Membrane Water Treatment. The certification program is organized into TWO *stand-alone* modules, each with 2 full teaching days, to offer training at an **Intermediate** and **Advanced** level. Each module of the course has a standard syllabus with detailed content updated and developed on an annual basis to ensure that the course content reflects the latest developments. The program is focusing on practical information on design and optimization of UF/MF membrane water plants. This program is aimed for engineers and project managers working at water treatment plant consultants and contractors.

Participants can choose modules based on the level of knowledge and level of experience related to membrane water treatment. Those wishes to join only *advanced level module* must have fundamental level knoledge on membrane water treatment. Participants who have joined previous WTA program on UF/MF Membrane Water treatment are encouraged to join advanced level module. It is possible for those new to the subject to take the two parts of the course at different times to gain experience in applying course material before moving to the advanced level.

Program Language : ENGLISH

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UF/MF Membrane Water Treatment

23-27 September 2013

Kuala Lumpur, Malaysia

Schedule of Program

INTERMEDIATE Level Session (Module 1): 23-24 September 2013
Program Agenda: *9 am to 5 pm* (both days)

ADVANCED Level Session (Module 2) : 25-27 September 2013
Program Agenda: 25 September 2013 (*2 pm to 5 pm*)
26 September 2013 (*9 am to 5 pm*)
27 September 2013 (*9 am to 12 pm*)

Exam on Intermediate Level : 25 September 2013 (*9 am to 12 pm*)
Exam on Advanced Level : 27 September 2013 (*2 pm to 5 pm*)

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Program Instructor - Dr. Graeme Pearce

Dr Graeme K Pearce is a membrane technology specialist with 30 years experience in the membrane industry. A graduate of Oxford University in chemistry and chemical engineering, Dr Pearce's introduction to membrane technology started in BP in 1980. In 1991, he was Technical Director of the start-up Kalsep, a buy-out from BP. The company was a key participant in the development of the UK membrane filtration market for drinking water. Dr Pearce joined Hydranautics in 2000, where he was responsible for the development and marketing of the ultrafiltration (UF) and microfiltration (MF) technology. In 2005, Dr Pearce left Hydranautics to form an independent consultancy, Membrane Consultancy Associates (MCA), working with a broad spectrum of users and providers of membrane technology, to improve the knowledge base and application of membranes in water, wastewater, and process industries. Dr Pearce has authored numerous papers and articles on membranes. He has recently written 'UF/MF Membrane Water Treatment', a companion guide to this Workshop, and has provided the membrane filtration contribution to two books, namely 'The Guidebook to Membrane Desalination Technology' and 'The Guidebook to Membrane Technology for Wastewater Reclamation'.

Program Outline - Intermediate Program (Module 1)

1. UF/MF Basics: What is UF/MF, how the technology works?

Definitions and terms used
Separation mechanisms and factors influencing performance
Membrane materials and polymer choice
Surface characteristics and hydrophilicity
Fouling and how to control it

2. Module Format & System Configuration

Module design options
Pros and cons of different format and configuration choices
Process sequence for filtration, backwash and cleaning cycles, and for different formats

3. Membrane Filtration Process Design

Application categories
Process design guidelines for inside and outside feed formats
Temperature correction
Exercise: Flux selection from guidelines and published data

4. Introduction to System Design

Components, layout and arrangement, and flowsheet

5. Comparative Review of UF/MF Suppliers

Commercial products; overview with tabulated summary for international suppliers
Focused review of market leaders, ie GE-Zenon, Pall/Asahi, Pentair-Xflow, Siemens-Memcor
Product Specification
Mode of Operation

6. Applications

Membrane filtration in drinking water, wastewater reuse, SWRO pre-treatment
Current status, drivers, indicative markets and growth
Energy comparison with conventional and operating cost breakdown for membranes
Legislation, regulation and approval
Indicative performance

7. Performance and Membrane Fouling

Critical, threshold, and sustainable flux
Permeability and fouling trends
Exercise: Calculating sustainable flux from pilot data
Examples of sustainable flux calculated from case studies

8. Operational issues

Delivery, storage, commissioning, shutdown and mothballing
Membrane integrity testing
Calculating Log Removal Values (LRV) from pressure decay data
Fibre repair

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Program Outline - Advanced Program (Module 2)

9. UF/MF Properties

Polymeric membrane fabrication by phase inversion (NIPS and TIPS), and stretching
Morphology and modification options
Characteristics and surface charge comparison
Pore size distribution and performance comparison
Fibre dimensions and potting issues

10. Membrane Filtration System Design

Rack size selection, pipework velocity, redundancy, and tank sizing
Exercise: System design and sizing of racks and system components
System scope; building blocks and package systems
Design software

11. Comparative Review of UF/MF Suppliers

Recent developments of international suppliers and brief review of Asian suppliers
Product Specification
Mode of Operation

12. Ceramic Membranes

Advantages of ceramics compared to polymeric
Materials and manufacturing
Properties, pros and cons of different materials, and surface characteristics
Modules and products
Performance examples
Brief review of suppliers

13. Monitoring and Permeability Trends in UF/MF

Permeability trend analysis and monitoring
Target permeability
Performance optimization using permeability indices

14. Case Studies

Case studies in drinking water, wastewater reuse, and SWRO pre-treatment; performance comparison, energy analysis and cost comparison

15. Foulants, Chemicals, and Applications

Foulant categories; removals, fouling and cleaning issues
Dosing and cleaning chemicals; options and procedures
Membrane System Warranty
Operating plant experience of fibre breakage frequency
Advanced Application Issues; bio-fouling and disinfection in SWRO pre-treatment

16. Troubleshooting

Problem investigation and monitoring
Failure modes and mechanisms; particle and bacterial contamination
Pressure spikes and potting problems
Effect of format on problems experienced
Remedy
Fibre repair issues

Certification Procedure

At the end of each module, there is an optional half day test to provide an assessment of the participant's understanding of the module material using the following format.

Test 1	Multiple choice section and short answer section	40 minutes (40 marks)
Test 2	Calculation of design parameters	30 minutes (30 marks)
Test 3	Design example from a case study	30 minutes (30 marks)

Test 1 will assess whether the participant has adsorbed the facts and basic taught information in the main lectures. Tests 2 and 3 will be based on the group exercises used in the modules, and will test understanding and the ability to apply the knowledge gained. The following certificates will be available for students:

Certificate of Attendance – participant has attended the 2 day course

Certificate of Competence – participant has attended the course and passed the test (>50 marks) with grades

A	70 marks or above
B+	65 - 69 marks
B	60 – 64 marks
C+	55 – 59 marks
C	50 – 54 marks

Examination Schedule:

Intermediate Level : 25 September 2013 (*9 am to 12 pm*)
Advanced Level : 27 September 2013 (*2 pm to 5 pm*)

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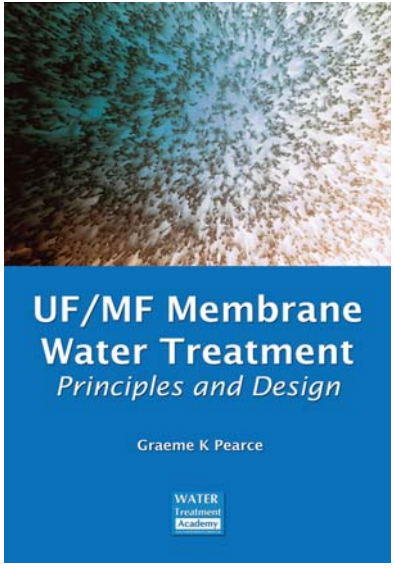
Book - UF/MF Membrane Water Treatment

Author: Dr. Graeme Pearce
Publisher: Water Treatment Academy

Participants who registers for both programs will receive this book as part of training documentation. If you wish to purchase, the book cost is 200 US$ excludes shipping cost.



This book provides a comprehensive description of the state of the art of ultrafiltration (UF) and microfiltration (MF) membrane technology in water and wastewater applications. The book will give practitioners a comprehensive understanding of all key facets of membranes and their application. The discussion of 'Fundamentals' will give a thorough grounding of the basis of the technology. Together with the review of 'Commercial Membranes and Modules', the reason for the relative diversity of this field will be explained. Readers will then be better equipped to select the most suitable option for a particular application. The book then goes on to describe issues involved in 'System Design', including flux selection, selecting and sizing of components, and developing the process control philosophy. The major applications of drinking water, wastewater reuse, and desalination pre-treatment will then be explored, highlighting key technical issues, energy use, and cost. Procedures for monitoring and trouble-shooting will be discussed to assist operating personnel to get the best from their plant by identifying shortcomings or emerging problems, developing remedies, and improving performance. The final chapters will illustrate examples of plants through 'Case Studies' and describe the issues involved in 'Project Execution'. The objective of the book is to provide a description and explanation of membrane technology in the water industry, and to improve the experience of trying to implement a scheme. The book will be essential reading for all project and process engineers, plant designers, planners, and operational personnel involved in municipal and industrial membrane projects. Also scientists and academics interested in the application of membranes in the water industry will find an insight into latest trends in commercial membrane technologies.

Training Venue - Impiana KLCC Hotel, Kuala Lumpur, Malaysia

Impiana KLCC Hotel
13 Jalan Pinang, 50450 Kuala Lumpur, Malaysia
Tel: 60 3 2147 1111 Fax: 60 3 2147 1028
website: www.impiana.com

To reseve a room at this hotel, please book online at www.impiana.com and select "Impiana KLCC Hotel"

Organizer - Water Treatment Academy

WATER Treatment Academy
www.watertreatment-academy.org

Established in 2005, Water Treatment Academy (WTA), a division at TechnoBiz Communications Co., Ltd is an educational and knowledge-based platform for water and wastewater treatment designers and operators. WTA offers speciliased training certification programs and organizes technical conferences related to water and wastewater treatment. WTA also publishes reference books on water and wastewater. More information is available at **www.watertreatment-academy.org**.

WTA Certification Program

UF/MF Membrane Water Treatment

23-27 SEPTEMBER 2013

KUALA LUMPUR, MALAYSIA

REGISTRATION FORM

(Please fill all the information in ENGLISH Only)

Company Name .....

Address .....

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Country ..... Zip Code .....

Tel..... Fax.....

Email.....

Contact Person.....

Email .....

Mobile Number .....

Please select the program

- ❍ Intermediate Level Program (1,500US$/Person)
- ❍ Advanced Level Program (2,000 US$/Person)
- ❍ Both Intermediate & Advanced Level (3,000 US$/Person)

Remark:

Payment is required with registration

Registration fee includes food and training documents only.

Participants are required to make their own accomodation arrangements

Early Bird Discount

Register before 15 July 2013: 15% Discount

Register before 15 August 2013: 10% Discount

Group Discount

If 3 or more than 3 delegates register for the same program from the same company, 10% discount will be offered on the total registration fee.

Participant Names

Participant 1 ..... Position.....

Email ..... Mobile No .....

Participant 2 ..... Position.....

Email ..... Mobile No .....

Participant 3 ..... Position.....

Email ..... Mobile No .....

Payment Method

❍ Bank Transfer to "Bangkok Bank, A/C Number: A/C No: 177-0-70727-9, A/C Name: **TechnoBiz Communications Co., Ltd,** Bank Branch : Ratchada-Lardprao Road Branch, Swift Code: BKKBTHBK" *(Please pay for all bank charges)*

❍Credit Card ❑Visa ❑MasterCard ❑American Express (5% bank fee applies for creditcard processing)

Card Number ..... Cardholder Name .....

Last 3 Digits on Signature Panel..... Card Expiry Date.....

Cardholder Signature ..... Date.....

Please send the registration form to

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Educational and Knowledge-based Platform for Water and Wastewater Treatment Designers and Operators