COURSES IN

Principles of Wastewater Treatment
Design of Biological and Advanced Wastewater Treatment Processes
Energy Efficiency of Wastewater Treatment Plants
Drinking Water Treatment: Principles, Practice and Applications
Design and Operation of Membrane Systems in Municipal, Mining and Industrial Applications
Odour Assessment and Management
Corrosion and Odour Management in Sewers
Introduction to Coastal Processes and Coastal Engineering
Process Modelling for Water Treatment Professionals
Understanding and Managing Air Quality Course (in conjunction with CASANZ)
IWES is the largest and most successful continuing education program for professionals responsible for industry environmental performance in Australia.

Courses are taught by leading industry practitioners and designed to keep busy professionals abreast of the latest trends, technologies and practices.

IWES is the training provider of choice with several large organisations, and we strive to continue to innovate in our course offerings and delivery.

We look forward to continuing to provide a key service for environment industry professionals.
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Principles of Wastewater Treatment

The aim of this course is to teach the key enabling scientific and process engineering fundamentals which underpin wastewater treatment processes. These are taught via real wastewater treatment problems and case studies. This is the most popular wastewater fundamentals course offered in Australia. Now featuring site visits, real case study data and exercises, and state-of-the-art multi-media teaching resources.

ISSUES ADDRESSED

DAY 1
- Wastewater characterisation and sampling
- Primary treatment technologies
- Preliminary treatment and data audits
- Workshop problem 1

DAY 2
- Secondary treatment (aerobic versus anaerobic)
- Biological treatment technologies - ponds, biofilm processes, aeration, high rate anaerobic and aerobic processes
- Plant Visit 1

DAY 3
- Aquatic chemistry - why is pH so important?
- Activated sludge (incl. SBR, MBR, trouble-shooting)
- Workshop problem 2 - Secondary treatment design exercise

DAY 4
- Tertiary treatment - ion exchange, adsorption, membranes, disinfection
- Biosolids Management
- Plant Visit 2

DAY 5
- Water Reuse - municipal and industrial case studies
- Biological Nutrient Removal
- Workshop problem 3

WHAT DO YOU GET
- Access to a world leading training resource
- Access to world leading practitioners
- USB and hardcopy course notes
- Two half-day plant visits
- Three detailed workshop problem sessions based on real case study material
- Core engineering skills and tools to take back to your workplace, which will enable you to analyse and troubleshoot your wastewater problems
- Real plant data and exercises

WHO SHOULD ATTEND?
Engineers, scientists, managers and new staff who require an excellent introduction to the principles of wastewater treatment.

Go to www.iwes.com.au for the extended course outline
Design of Biological and Advanced Wastewater Treatment Processes

This course focuses on the design, operation and optimisation of leading-edge treatment systems for both municipal/industrial settings, the sort of technologies and issues that are not easily found in textbooks.

The course is specifically designed for those with some familiarity with the principles of wastewater treatment who seek to both deepen and broaden their understanding. By completing this course, you become familiar with the main drivers influencing modern treatment plants, and the key methodologies and parameters used in their design. The course is a mixture of interactive workshops, site visits and inspirational teaching.

DAY 1
- Design Issues for Biological Systems
  - Critical design issues: municipal and industrial systems
  - Basic bioenergetics: COD vs BOD
  - Organism growth and decay
  - Sludge age and biological mass fractions
  - Nitrogen removal: principles, analysis, modelling
  - Design workshop 1: process option selection and integration

DAY 2
- Biological Nutrient Removal
  - Phosphorous removal: biological and chemical
  - BNR process configurations and case studies
  - BNR activated sludge design and very tight N and P limits
  - Design workshop 2: Design of BNR plant

DAY 3
- Site visits and Recycling Issues

DAY 4
- Industrial wastewater treatment plants - design differences
  - Innovative primary technologies, modern screens, hydrocyclones, ultrasound, electrocoagulation
  - Anaerobic technologies
  - Design workshop 3: High rate anaerobic system

DAY 5
- Membrane bioreactors: design issues and case studies
  - Emerging technologies
  - Integrating WWTP’s as factories for water, energy and nutrients
  - Design workshop 4: Design of complex industrial WWTP’s

WHAT DO YOU GET
- Access to two leading wastewater designers and practitioners
- Design skills to take back to your workplace
- USB, including electronic working copies of design spreadsheets used in exercises
- Several real life case study examples
- Two site visits

WHO SHOULD ATTEND?
People desiring in-depth knowledge for design, concept generation, process selection for, and troubleshooting of modern wastewater treatment plants, often integrated with advanced water recycling systems. The course assumes familiarity with the fundamentals of wastewater treatment. Computer literacy (Excel spreadsheets) is a recommendation.

Presenters: Mike Johns and David Fligelman

Mon 9 | Tues 10 | Wed 11 | Thurs 12 | Fri 13

Go to www.iwes.com.au for the extended course outline
Energy Efficiency of Wastewater Treatment Plants

Improving energy efficiency represents an opportunity to both lower operational costs and carbon footprint. This course covers the state-of-the-art in energy efficient wastewater treatment, with emphasis on the approaches to:

(i) Minimise the contribution of process units to energy use on wastewater treatment plants (including aeration, pumping, mixing, solids treatment, solids handling, disinfection and other forms of tertiary treatment); and

(ii) Recover energy from the waste itself.

ISSUES ADDRESSED

DAY 1

- Wastewater treatment and energy use in urban water cycle
- Energy efficiency benchmarking
- Breakdown of energy use on typical WWT plants
- State-of-the-art in energy efficient wastewater treatment
- Wastewater composition
- Energy sinks in wastewater treatment
- The energy balance concept

DAY 2

- Motors – the basics of motor types and efficiency, apparent vs. true power, and the power factor
- Pumping – how flow, head, systems design, and viscosity affect energy inputs
- Aeration - how wastewater characteristics, type of aeration system, reactor depth, diffuser characteristics and blower choices affect energy inputs
- Mixing – what are the opportunities to save energy?

DAY 3

- Energy recovery from anaerobic digestion of organics – what’s the energy input and what are the benefits?
- Energy considerations around solids incineration and drying
- Energy use for tertiary treatment, including disinfection
- New directions in wastewater treatment, energy and resource recovery
- Relationships between plant performance (carbon and nutrient removal) and energy input
- Workshop on energy management and plans.

WHAT DO YOU GET?

- Access to a world leading training resource
- A USB containing all electronic materials
- Virtual tour of a large municipal WWTP
- A detailed workshop problem session based developing energy management plans
- Core engineering skills, including the ability to calculate energy use benchmarks or conduct an energy balance
- Real plant data and exercises.

WHO SHOULD ATTEND?

This course is designed for engineers, managers, urban planners, environmental consultants, and regulators who are interested in improving energy efficiency at wastewater treatment plants.

Go to www.iwes.com.au for the extended course outline

Presenters: David de Haas and David Solley

| Mon 9 | Tues 10 | Wed 11 |
Drinking Water Treatment: Principles, Practice and Applications

The aims of this course are to identify key water quality issues, describe the major water treatment processes currently used, and to outline new approaches for optimising water treatment.

This is a practical course, and case studies are used extensively in teaching. The course concludes with an interactive design workshop to consider the issues and required treatment for a theoretical water source and water quality.

ISSUES ADDRESSED

DAY 1
- Overview of the Australian Drinking Water Quality guidelines
- Emerging water quality issues
- Effective water quality management, including case studies
- Disinfection processes and their advantages and disadvantages
- Conventional water treatment technology
- Variations to conventional treatment
- Case studies from operating full scale plants
- Introduction to membrane technology
- Water Treatment Exercise 1

DAY 2
- Causes and treatment of issues related to cyanobacteria
- Treatment options for taste and odour compounds and algal toxins
- Water Treatment plant visit

DAY 3
- Problems relating to inorganic contaminants
- Oxidation and physical processes for removal of arsenic, iron and manganese
- Impact of natural organic matter (NOM) and new approaches to characterise it
- Removal of NOM - optimising coagulation and alternative treatments
- Overview of desalination, including a case study
- Water Treatment Exercise 2

WHAT DO YOU GET
- Access to world leading experts
- Advice with local issues
- USB and hardcopy course notes
- Relevant publications and websites to seek further information
- Half-day plant visit

WHO SHOULD ATTEND?
The course is designed specifically for engineers, plant operators, scientists, consultants and researchers who do not have a strong background in water quality issues or water treatment processes. It aims to provide an understanding of the issues facing the potable water industry to assist in providing a better water quality outcome.

Go to www.iwes.com.au for the extended course outline
Design and Operation of Membrane Systems in Municipal, Mining and Industrial Applications

A selection of courses on design and operation of membrane plants in a range of applications that can be taken as single days or multi-day modules. Each day is self-contained and offers a practical, problem based approach to design and operation of membrane systems in municipal, industrial and mining applications. (Discounts apply for multi-day enrolment, 3-5 day registration options available).

Each module (course day) includes a design problem covering water quality, equipment selection and sizing, data collection and interpretation, operating strategies, trouble shooting and cost estimating.

Go to www.iwes.com.au for the extended course outline

ISSUES ADDRESSED

MODULE 1 Design and operation of membrane bioreactors for wastewater treatment
- Comparison of Membrane Bioreactors (MBR) with conventional wastewater treatment
- Equipment selection and sizing calculators for MBRs
- Essential features of balance of plant; head-works, aeration, solids handling and chemical storage
- Operating issues including optimising power consumption and membrane cleaning.

MODULE 2 Design and operation of ultrafiltration and microfiltration systems
- Treatment objectives and basic water quality
- Equipment selection and sizing calculators for microfiltration and ultra-filtration systems
- Development of capital and operating costs
- Operating issues, membrane cleaning & monitoring.

MODULE 3 Design and operation of reverse osmosis or nano-filtration system
- Treatment objectives in municipal, food, pulp and paper and mining applications
- Analysing water quality and using membrane design software for RO and NF
- How to size reverse osmosis equipment
- Operating issues: Normalising and interpreting

MODULE 4 Design and operation of membrane processes in sensitive areas and mining applications
- Treatment objectives for mine water
- How to size equipment including DAF & Ion Exchange
- Operating issues and designs solutions
- Specialist modelling overview for CSG applications
- Equipment sizing and cost estimating.

MODULE 5 Techniques for improving and optimising operational Issues: Process optimisation
- Diagnosing and characterising fouling using membrane autopsy techniques
- Restoring membrane permeability through cleaning
- Options for reducing power consumption
- Developing asset management strategies

WHAT DO YOU GET
- Select from 3, 4 or full 5 day attendance options
- USB with design software and hardcopy Australian and international case studies
- Q&A with experienced designers and plant operators
- Site visit to full scale plants

WHO SHOULD ATTEND?
Anyone who wants to know how to design and operate membrane plants for water and wastewater treatment, water recycling and desalination. The course assumes basic knowledge of water quality and engineering concepts. Participants are encouraged to bring a laptop computer. Numbers will be limited.
Odour Assessment and Management

This course provides a practical grounding in the principles of odour measurement (source and ambient), assessment and control. Odour is a challenging issue in many communities, involving both technical and social complexities. The course includes site visits and workshop sessions. It uses extensive reference to case studies to illustrate the principles.

Now running over 3 days, this course will take you from the basic principles through to complex real-world situations where those principles can be seen at work.

ISSUES ADDRESSED

DAY 1 The Principles
- The human odour response
- Odour sources and generation mechanisms
- Quantification: Sampling and measurement issues
- Emissions estimation and dispersion modelling
- Workshop 1 - Odour modelling and evaluation

DAY 2 Regulation and Management
- Odour impact assessment principles
- Regulatory approaches to odour management
- Control technologies and design principles
- Practical management principles
- Plant visit to an operational site where odour is an important issue

DAY 3 Real world issues
- The odour laboratory – how are odour samples handled, analysed and evaluated?
- Workshop 2 - New source proposal with cumulative impacts
- Workshop 3 - Prosecution for odour offence

WHAT DO YOU GET
- Access to leading Australian odour practitioners
- Course notes in hardcopy and USB, plus resource material
- Three intensive workshop sessions based on real case study material
- Practical understanding and tools to help you address odour management problems in your workplace
- Australian case studies and exercises
- Field activities including visits to an odour lab and an operating plant

WHO SHOULD ATTEND?
Anyone who wants an excellent grounding in the principles of odour measurement, assessment and control. including environmental managers, air quality managers, regulatory agency officers, local government environmental officers, consultants and researchers.

Go to www.iwes.com.au for the extended course outline

Presenters: Geordie Galvin

Mon 9 | Tues 10 | Wed 11
Corrosion and Odour Management in Sewers

The aim of this course is firstly to teach the key science and engineering principles underpinning sewer processes, and secondly to use this knowledge to understand and manage key issues such as corrosion, odour and greenhouse gas emissions.

The course presents the essential information and proven technologies for the management of sewers. Both liquid and vapor phase technologies will be covered. The effectiveness and limitations of each technology will be assessed through the use of case studies and biotransformation processes.

ISSUES ADDRESSED

DAY 1  The drivers and under-pinning science
• In-sewer physical, chemical and biological processes
• Microbial processes leading to production of hydrogen sulfide, methane and other hazardous compounds
• New challenges under climate change: reduced sewer flow and increased concentrations of pollutants
• Odour generation
• Gas/liquid mass transfer of volatile compounds
• Workshop 1: Prediction of hydrogen sulfide production

DAY 2  Sewer processes: modelling and measurement
• Modeling sulfide production and emission from sewers
• Modeling methane production and emission
• Chemical dosing for emission control in sewers - e.g. oxidants, ferric chloride, lime, caustic and nitrite
• Workshop 2: Design of chemical dosing for hydrogen sulfide control
• Corrosion in sewers
• Odour and odorant identification and measurement

DAY 3  Technologies, maintenance and planning
• Ventilation in sewers including design and operating
• Overview of air phase treatment technologies and emerging technologies
• Workshop 3: Design of a biological filter
• Odour control planning
• Benefits of public outreach approach
• Quantifying odour impacts
• Liquid and gas phase measurement using on-line sensors
• How public outreach and innovations can fit together
• Odour assessment and control innovations

WHAT DO YOU GET
• Access to world-leading researchers and practitioners
• Course notes and USB
• Real case studies
• Real field data and exercises
• Exposure to world-leading sewer models

WHO SHOULD ATTEND?
• Engineers and managers involved in sewer systems
• Local governmental officers
• Consulting engineers providing services on sewers
• Regulatory agency officers
• Researchers

Go to www.iwes.com.au for the extended course outline

Presenters: Josef Cesca, Keshab Sharma and Guangming Jiang
Introduction to Coastal Processes and Coastal Engineering

The aim of this course is to introduce Coastal Processes and how these relate to the principles and practice of Coastal Engineering. You will learn the fundamentals of the hydraulic and sedimentary processes that shape the active coastal zone, identify and discuss appropriate tools to analyse problems and design solutions to coastal erosion, and learn the design principles of harbours, breakwaters, beach nourishment and other coastal protection measures.

WHO SHOULD ATTEND?

The course is designed specifically for engineers, scientists, and state and local authority officials charged with managing coastal resources and development, who do not have a strong background in Coastal engineering. The course aims to provide an overview of the key principles to assist attendees with communication and interaction with specialist coastal consulting engineers.

ISSUES ADDRESSED

DAY 1

• Introduction to the course
• Water waves – impact on the coasts and coastal erosion processes
• Linear long waves – theory and approximations
• Sine waves – application, flow field, pressure field
• Wave statistics – random waves, expected maximum wave heights, wave groups
• Fieldtrip to Gold Coast beaches, Nerang river breakwaters and sand bypass pier

DAY 2

• Offshore wave measurements - design conditions
• Outside the surf zone – breakwaters and harbours
• Inside the surf zone - wave setup, surf beat, longshore currents.
• Beach face process - wave run-up, including tsunami run-up.
• Impact of these processes in terms of coastal inundation and coastal safety
• Beach groundwater – coastal aquifers, dispersion of pollutants, vegetation

DAY 3

• Coastal sediment transport – sediment budgets, how to analyse, coastal cells
• Long-shore and cross-shore transport principles – key drivers, influence of man-made and natural structures, mitigation measures
• Coastal area modelling – present state-of-the-art in hydrodynamic models and morphology
• Discussion of research issues and current problems
• Discussion of challenges faced by course delegates in managing coastal projects. Beach face process - wave run-up, including tsunami run-up.

WHAT DO YOU GET?

• Access to world-leading experts and local researcher
• Textbook - Coastal and Estuarine Processes (2009), Peter Nielsen
• Site visit to observe and discuss key coastal processes
• Discussion of issues relevant to delegates

Presenters: Tom Baldock

Go to www.iwes.com.au for the extended course outline
Process Modelling for Water Treatment Professionals

This is an interactive two-day course built around forecasting water quality and addressing treatment plant performance issues arising from changing feed water conditions.

Engineers will learn to understand the influence of water chemistry on process design and how to use this knowledge to optimise performance. Participants will also design new treatment plants and size equipment using comprehensive software that integrates material and heat balancing, equipment sizing, stream property and solubility prediction.

Each module includes realistic scenarios for advanced water treatment applications including boiler feedwater, cooling water blowdown, industrial wastewater, seawater desalination, mine dewatering and brine management.

Go to www.iwes.com.au for the extended course outline

Who Should Attend?

There is an assumed level of knowledge for this course. Please consult the AqMB User Guide if you are uncertain whether your level of experience is adequate. Process engineers, consultants and operators involved in concept design, sizing and/or operation of existing physico-chemical water treatment plants involving conventional (settling, filtration), membrane, resin, electrolytic or thermal technologies.

Issues Addressed

Day 1 Module 1 Water Chemistry Essentials

• A comprehensive overview of essential water quality properties for treatment plant design
• Basic theory around chemical equilibrium reaction kinetics and redox potential

Module 2 Unit Operation Types

• An overview of most technologies used in water treatment
• Modes of action defining separation for each technology

Module 3 Configuring Flowsheets for Process Design

• Developing a feed water scenario for typical and boundary conditions
• Process design considerations, constraints, performance objectives and assumptions

Day 2 Module 4 Process Modelling for Performance Optimisation

• An overview of each unit operation, their key process parameters (design/operational) and how they are used in each model simulate equipment performance
• Learn how to optimise a process design for performance objectives by refining process design parameters for each unit operation.

Module 5 Process Economics and Lifestyle Evaluation

• Produce vendor data sheets and RFQ documentation for equipment pricing
• Calculate power, chemical and consumable operating costs
• Estimate turnkey capital costs for a greenfield application

Module 6 Creating a Process Design or Scenario Modelling Report

• Documenting the basis of design
• Key elements of a process design report

What Do You Get?

• Free 3 months subscription to AqMB simulation software for water treatment
• USB and hardcopy course notes
• Q&A with experienced designers.
Understanding and Managing Air Quality Course (in conjunction with CASANZ)

This NEW two-day course introduces the fundamental aspects of air quality management, including the science behind the behaviour and effects of air pollution. The course covers the principles of air quality and air pollutants and describes how pollutants are assessed through modelling, monitoring and emission inventories. Air quality management is presented and discussed through group exercises and case studies. This course is presented by IWES in conjunction with the Clean Air Society of Australia and New Zealand.

ISSUES ADDRESSED

Introduction
• Air quality and air pollution definition
• Overview of the regulatory framework standard

Introduction to Common Air Pollutants
• Identification of common air pollutants
• Australian and N Z health based standards

Hazardous Air Pollutants
• Definitions, identification and guidelines of hazardous air pollutants.

Fate and Transport
• Describes the factors influencing the outcome of emissions including dispersion, transformation and atmospheric removal processes.

Atmospheric Pollution Modelling
• Basic meteorology parameters and how these relate to air quality.
• Defines air quality models and how they are used
• Model types, advantages and disadvantages
• Model inputs and outputs
• Applications.

Odour, Dust and Amenity
• Odour measurement and management
• Dust measurement and management.

Indoor Air Quality
• Key pollutants and their sources
• Management options.

Global and Trans-Boundary Air Pollution
• Climate change
• Ozone depletion
• Other trans-boundary air pollution issues.

Air Pollution Monitoring
• Monitoring objectives
• Network design and siting
• Equipment maintenance
• Data, quality assurance and reporting
• Monitoring methods.

Estimating Emissions to Air
• Techniques for estimating emissions
• National Pollutant Inventory.

WHO SHOULD ATTEND?
• Local Government or regulatory agency employees managing or working with air quality issues
• Industry, Transport, Mining, Building, Road Construction industry professionals
• Environmental managers, consultants, scientists and engineers requiring an introduction to air quality.

Go to www.iwes.com.au for the extended course outline

Presenters: Janet Peterson
The Presenters

**Tom Baldock**

Tom Baldock is a Coastal Engineer and Professor in the School of Civil Engineering at the University of Queensland.

He teaches Hydraulic Engineering, Fluid Mechanics and Coastal Engineering. His main research focus is surf zone and swash zone hydrodynamics and sediment transport, both experimental and field, for application to wave run-up and coastal inundation, tsunami, beach erosion and coral reef processes, and how these may change with projected sea level rise.

Tom has strong national and international collaboration on research on topical issues in coastal engineering and close links with Government and National agencies.

**Matthew Brannock**

Dr Matthew Brannock has a wealth of experience in water and wastewater plant design and brine characterisation. He is a very capable modeller with extensive experience using chemical speciation and computational fluid dynamic (CFD) models for process simulation both for academic and process design applications.

Matthew holds a PhD in Environmental Engineering from The University of Queensland. His research saw him develop CFD tools for the design of wastewater treatment and membrane systems. He has published more than 20 papers in respected journals such as Water Research, Desalination and the Journal of Membrane Science. Following his academic career, Matthew has spent 10 years in the consulting engineering industry specialising in process design of water and brine treatment systems.

**Josef Cesca**

Josef is a recognized national expert in air and odour emissions control and permitting for municipal and industrial applications and wastewater collection and treatment systems. He is currently the Technology Leader for Odour and Air Quality in the Asia Pacific Region for CH2M HILL, and has over 20 years experience in odour control and measurement in wastewater collection systems and treatment facilities.

He has been responsible for the review of systems to identify odour generation causes and assessment of odour impacts, and has implemented various emission control technologies at over 100 sites, including some of the largest facilities in Australia and New Zealand. This work has involved the design and commissioning of some of the largest biotechnology odour control systems in Australia.

He also has over 25 years of extensive experience in biosolids, water, and wastewater treatment. He is currently leading the Australian research into understanding the impacts of ventilation in sewers as part of a national program on corrosion and odour management which involves seven major Australian water utilities, four Australian universities, as well as several other Australian and international partners.
The Presenters

David Cook

David Cook is a Senior Scientist, Water Treatment and Distribution Research, Australian Water Quality Centre, at SA Water Corporation. David has been investigating water quality issues associated with drinking water treatment processes and distribution systems since 1997. Through the participation and management of laboratory and pilot scale projects, David has gained experience in the following areas:

• Natural organic matter removal
• Optimisation of disinfection strategies (chlorination, chloramination and ozonation)
• Impact of source water quality on water treatment plant process performance and distribution system water quality management
• Removal of algal metabolites with powdered activated carbon
• Membrane process, particularly nanofiltration and reverse osmosis.

David regularly provides advice to SA Water and other water utilities regarding drinking water treatment and as presented outcomes of research at conferences and in scientific journals.

Shane Cox

Shane is a Chemical Engineer with a PhD from UNSW and has research experience in both water treatment and research data management. He spent a number of years as a researcher studying water treatment and research data management. Using this experience he left the research sector in 2012 to start Instrument Works.

Shane's previous startup experience includes being the lead engineer for the venture backed start-up Viva Blu – developing a novel photocatalytic approach to wastewater remediation and building a membrane autopsy consultancy business, Membrane Futures.

David de Haas

Dr David de Haas has over thirty years' experience in municipal water and wastewater treatment, covering laboratory investigations, use of pilot plants, research and development, process design and operation, planning and advisory functions. He has worked in wastewater-related consultancy with GHD in Australia for more than seventeen years.

David has strong specialist skills in use of wastewater treatment models such as the Biowin™ simulation package. He has previously taught IWES training courses in advanced biological treatment, nutrient removal and energy efficiency in wastewater systems.

David has undertaken research projects focusing on greenhouse gas emissions from wastewater treatment plants in Australia and has experience in greenhouse gas accounting. He has also participated in research projects through the University of Queensland into Life Cycle Impact Assessment of alternative urban water cycle systems, including water recycling and desalination options.

He has led studies on sustainability for projects funded through the Australian Water Recycling Centre of Excellence, in collaboration with the University of New South Wales and a range of other industry partners. On behalf of WSAA, he has led two studies for industry benchmarking of energy use in wastewater treatment plants. The first round was in 2013-14 and covered 142 plants in Australia. The second round, in 2016-17, covered a larger number of plants (245) in both Australia and New Zealand. He also regularly helps clients with plant reviews of energy use, aimed at improving efficiency, maximising capacity and minimising cost.
Geordie Galvin

Geordie Galvin is a Principal Environmental Engineer with PAEHolmes and is also odour practice leader. He has over 12 years’ experience in air quality assessment and is one of the firm’s lead consultants on odour and dust studies. He has completed numerous air quality studies including projects involving wastewater treatment plants, chicken farms, piggeries, cattle feedlots, ethanol plants, soil conditioning operations, and alumina refineries.

He has consulted to local and state government agencies throughout Australia and to universities in the United States including University of Nebraska, University of Delaware and West Texas A & M. Geordie has also given numerous invited workshop presentations on odour sampling and analysis in the United States and Australia.

In addition to consulting work, Geordie has acted as an expert witness for numerous court cases in Australia and New Zealand. He has bachelor and masters degrees in environmental engineering and is a member of the Institute of Engineers Australia, a Member Engineer of the American Society of Agricultural and Biological Engineers and the Clean Air Society of Australia and New Zealand (CASANZ). Geordie is currently the chair of the odour special interest group (OSIG) within CASANZ.

Guangming Jiang

Guangming was awarded his PhD in Environmental Engineering at The University of Queensland in 2011. Also, he completed a Master of Applied Science in Environmental Microbiology (Lincoln University, New Zealand), and a Bachelor of Engineering in Environmental Engineering (Harbin Institute of Technology, China). Currently, he continues his research on sewer corrosion & odour management and sewage epidemiology at Advanced Water Management Centre.

Paul Lant

Paul Lant is a Professor within the School of Chemical Engineering at The University of Queensland. He has an international reputation for his research in the field of wastewater treatment. His formal qualifications include a MEng and PhD from Newcastle University (UK) and an MBA from The University of Queensland.

He was a co-founder of the Advanced Water Management Centre, the leading water and wastewater R&D group in Australia. Paul is also establishing a reputation as a leading chemical engineering educator, receiving awards for undergraduate teaching and postgraduate supervision innovations. He was a member of teams winning national teaching awards for both undergraduate and postgraduate education in 2005 and 2006. Paul has successfully started up a number of commercial ventures. He is the Founder and a Director of Wastewater Futures Pty Ltd, a wastewater technology company which specialises in wastewater treatment solutions for industrial applications.
The Presenters

**Greg Leslie**

Greg Leslie is a Professor of Chemical Engineering and the deputy director of the UNESCO Centre for Membrane Science and Technology at the University of New South Wales. Prior to joining UNSW, he worked in the public and private sector on water treatment, reuse and desalination projects in Australia, New Zealand, Singapore, Hong Kong and the United States.

Greg’s experience includes work on the Singapore NEWater recycling projects at Bedok, Kranji and Seletar and at the Orange County Water District (OCWD) in California as the deputy programme manager for the Groundwater Water Replenishment System; the largest indirect potable reuse project in the United States.

**Janet Peterson**

Janet Petersen is the President of the Clean Air Society of Australia and New Zealand.

Janet is highly experienced in air quality management, including research and monitoring, policy and strategy development. She has lead air quality work for nearly twenty years in a range of organisations such as science, industry, consulting and local government.

Janet convened the National Air Quality Working Group (NAQWG) for four years and has participated in a range of national steering and technical groups for projects such the National Environmental Indicators Programme, the NAQWG Research Strategy, HAPINZ and transport emissions research.

**Steven Pratt**

Steven is a Lecturer in Chemical Engineering at The University of Queensland. He is a chemical engineer with a PhD in wastewater engineering, and has expertise in industrial wastewater treatment and environmental biotechnology. Prior to working at UQ, Steven worked as a Lecturer in Environmental Engineering at Massey University, New Zealand, where he consulted to local government and the dairy industry on sustainable wastewater treatment, focusing on passive wastewater treatment systems and energy recovery from domestic and agricultural wastes.

Steven is driving a variety of exciting research projects, including producing algal biodiesel and biodegradable polymers from industrial effluents. He is a co-developer of the TOGA Sensor, an innovative high-tech instrument which enables greater insight into biological processes, such as advanced wastewater treatment systems.
The Presenters

Keshab Sharma

Dr. Keshab Sharma is currently with The University of Queensland, serving as a Senior Research Fellow at the Advanced Water Management Centre. Dr. Sharma’s research interests include sewer process modelling, odour and corrosion control in sewer systems and integrated assessment of urban water systems. He has 14 year experience in odor and corrosion management in sewers and has been involved in number of sewer related research and consulting projects. He is one of the developers of the SeweX model and has been one of the key researchers in sewer corrosion and odour control at the Advanced Water Management Centre.

David Solley

David Solley is a process engineer with more than twenty five years’ experience in water and wastewater treatment. He has led successful process and multi-disciplinary teams for many significant wastewater and reuse treatment projects, largely in Australia. The projects have covered nutrient removal for municipal and high strength wastewater, water recycling processes, and biosolids treatment throughout Australia. David was instrumental in developing Brisbane’s regional biosolids treatment centre, incorporating thermal hydrolysis pre-treatment prior to anaerobic digestion and retaining co-generation for energy recovery. David’s experience includes 14 years as a design and operations engineer with the water utility Brisbane Water, which at the time owned and operated nine wastewater treatment plants. The remainder of his experience has been with water and wastewater treatment engineering consultancies; the last 12 years with GHD in Brisbane. David is a chartered chemical engineer with Masters and Bachelor level engineering degrees.

Darren Szczepanski

Darren has many years of project experience in the field of membrane, resin, electrolytic and thermal technologies within the water, wine and dairy industries. His process design experience includes installations in coal seam gas water, acid mine drainage, seawater, potable drinking water, industrial and municipal tertiary effluent, pharmaceutical, brewery waste, NBC contaminated waste and cooling tower blowdown applications. He has worked on the characterisation of water and brine, developed detailed design and functional specifications, and led the evaluation of complex competing process designs from major thermal technology vendors. Darren holds a Bachelor of Chemical Engineering from The University of Queensland.

Jason West

Jason is a chemical engineer from the University of New South Wales and has worked within the water industry for over twenty-seven years. Most of his experience has been attained within the industrial water sector particularly mining, metals manufacturing and power industry. For the past 11 years Jason has been working at SA Water primarily providing technical support to SA Water’s capital planning, operations and engineering groups the field of water treatment and water quality. Jason’s areas of expertise include conventional water treatment, desalination, membrane filtration and water quality risk management. He now manages a team of nine process and operational support engineers and scientists that provide technical advice to the business so that it can continue to deliver safe and affordable water to over 1.6 million South Australians.
Mantra on View

The Gold Coast is just a 50-minute drive from Brisbane, the capital of Queensland and just 20 minutes from Coolangatta where there is a well-serviced domestic airport. Only a two minute stroll to the beach, the venue is surrounded by fabulous international shopping, lots of cafes, bars and restaurants.

How to book accommodation

IWES delegates qualify for discounted parking and room rates. Please contact Jenny at Plan Ahead Events: jenny.m@planaheadevents.com.au, for accommodation enquiries.

Hotel details

22 View Avenue, Surfers Paradise, Queensland.
Ph: + 61 7 5579 1000
Website: https://bit.ly/2Hrk3IZ
What is IWES?

IWES is the largest and most successful continuing education program in Australia for professionals responsible for industry environmental performance.

Our mission is quite simple. It is to provide high quality short course training for environment industry professionals. Courses are taught by leading industry practitioners and designed to keep busy professionals abreast of the latest trends, technologies and practices.

Since 2008 we have run events annually in Sydney, Gold Coast, Melbourne and Perth, and in 2010 we ran our first event in Tasmania. We have averaged 660 delegates per annum through 2007-2017.

IWES delegates receive a certificate of attendance, on completion of their chosen course, which includes a record of continuing professional development (CPD) credits attained.

Visit our website at www.iwes.com.au where you will find further information on courses and upcoming events.

If you are unable to attend any of our scheduled events and/or would like information on organising a corporate/in-house training course for your staff please contact us for pricing and availability.

IWES is owned by The University of Queensland.
What do people say about IWES?

“Excellent course, principles explained in a comprehensive manner. A lot of material covered - good breadth and good depth as well - latest technologies also introduced.”

“Great subject matter, appropriate level of complexity that was well presented and explained. Good notes, broken in sections appropriately. Good mix of theory and practical. Great site visits to break things up - Great food, good venue with good facilities and access to public transport. All round worthwhile.”

“Content covered at a good pace. - A good number of breaks during the day - excellent responses to questions – with the right level of complexity, excellent slides, excellent content.”

“Presenter was extremely knowledgeable and shared material concisely and clearly. I left the course feeling inspired rather than bored, baffled or disappointed. Good combination of theory and application.”

“Fantastic overview of so many different areas of wastewater treatment. The course linked both real life problems with theoretical concepts.”

“Concepts were explained extremely well and very useful content. Case studies/workshops were a great practical application and the site visits were great to see concepts in action.”

“Very informative with varying levels at depth to suit both ‘newbies’ and the more experienced. Session lengths were good. Site visit was very good to reinforce content covered. Presenter did a great job of presenting the information.”

“Provided me with all the information to: 1 Ask the right questions, 2. Weigh the technical options 3. Solve problems to gain optimum performance from the plant.”

“Brilliant presenter! Well organised course.”

“Fantastic overview of so many different areas of wastewater treatment. The course linked both real life problems with theoretical concepts.”
WaterAid Australia’s vision is of a world where everyone has access to safe water and effective sanitation.

IWES is a corporate member, and proud supporter, of WaterAid.

WaterAid is an international NGO dedicated exclusively to the provision of safe domestic water, sanitation and hygiene education to the world’s poorest people.

WaterAid works by helping local organisations set up low cost, sustainable projects using appropriate technology that can be managed by the community itself. WaterAid is independent and relies heavily on voluntary support.

Together with improved hygiene, these basic human rights underpin health, education and livelihoods, forming the first essential step in overcoming poverty.

If you would like to receive more information about Wateraid, including how you can become involved in supporting this very worthwhile cause, please tick the box on the registration form.
## The Program

### Courses

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<tr>
<th>Course</th>
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<td>4 Drinking Water Treatment: Principles, Practice and Applications</td>
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<td>8 Introduction to Coastal Processes and Coastal Engineering</td>
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### Contact Us

Should you have any questions or queries, please contact the IWES team:

**Phone:** 1800 000 404  
**Email:** info@iwes.com.au  
**Web:** www.iwes.com.au  
**LinkedIn:** www.linkedin.com/company/iwes
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<td>Design of Biological and Advanced WWTP</td>
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<td>Odour Assessment and Management</td>
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**Cost of Registration (inc.GST)**

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**Discounts for organisations registering multiple delegates**

- 2 - 3 delegates = 5%
- 4 - 5 delegates = 10%
- 6 and over = 15%
- AWA Member = 10%
- UQ Alumni = 10%

**Registration Details**

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<tr>
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- I have dietary requirements. Details
- Please add my contact details to the IWES enews so I can receive updates on upcoming events.
- Please send me more information on WaterAid Australia.

Send completed form to IWES by email: info@iwes.com.au

**UQ ABN: 63 942 912 684**

**TERMS AND CONDITIONS**

1. Cancellation of registration less than 3 weeks before the starting date of a course(s) will incur a cancellation fee of 50% of the course price. Alternatively, delegates may send a substitute.
2. While every attempt will be made to deliver all advertised courses, IWES reserves the right to cancel individual courses at short notice. Only registrations submitted and invoiced in one batch qualify for multiple registration discounts.
3. AWA Member and UQ alumni discount cannot be used in conjunction with any other offer/discount.
4. AWA membership number: ____________________________
5. UQ student number: ____________________________