



# DRAINS

# Live Online Training

## PROGRAM

**Dr Benjamin Kus**  
Watercom

**Hossein Ansari**  
Watercom

This is a comprehensive instructor-led training course delivered live online over three days, including mandatory prework.  
*20 hours CPD.*

- **Online Pre-Work:** Introduction to ARR 2019
- **Format:** 2 Modules, delivered in 6 sessions over 3 days
- **16.5 hours** of live instructor time
- **Access recordings** of live content for 90 days
- Suitable for both **new and experienced** DRAINS users
- Includes **advanced modelling techniques**
- 30 days' access to DRAINS 50-Link Subscription

## PROGRAM: Mandatory Pre-Work (Online)

Duration	Content
0.5 hours	<p><b>Getting Started</b></p> <p>Downloading resources &amp; Installing DRAINS</p>
2.5 hours	<p><b>Australian Rainfall &amp; Runoff (ARR) 2019</b></p> <p>Why do we have a new set of guidelines?</p> <p>Overview of past editions of ARR</p> <p>Refresh on hydrology, loss models and routing models</p> <p>ARR 2019 Temporal Pattern Regions and Rural Loss Model Zones</p> <p>New ARR Probability Terminology</p> <p>Ensembles of Storms</p> <p>Understanding ARR 2019 catchment terminology (TIA, DCIA, ICIA, EIA, RA)</p> <p>DRAINS' application of ARR catchment terminology using Effective Impervious Areas (EIA), Remaining Impervious Areas (RIA), Pervious Areas (PA)</p> <p>ARR Data Hub</p> <p>Initial Loss Continuing Loss Data</p> <p>Understanding Rural Initial Loss vs Urban Initial Loss</p> <p>NSW OEH Specific Requirements (Probability Neutral Burst Initial Loss)</p> <p>Victoria-Specific Requirements</p> <p>Median Preburst Depths</p> <p>Understanding Initial Loss Storm vs Initial Loss Burst</p> <p>Modelling Climate Change</p> <p>Bureau of Meteorology 2016 IFD Rainfall Data</p> <p>Comparing ARR 87 IFD to 2016 IFD</p> <p>Challenges with ARR 2019</p> <p>Demonstration of ARR 2019 Regional Flood Frequency Estimation (RFFE) Model</p> <p>Overview of Design Objectives</p> <p>Safe Widths, Hazard Classifications, Freeboards</p> <p>Overview of applying ARR 2019 procedures with the DRAINS software</p>
0.5 hours	<p><b>Introduction to DRAINS</b></p> <p>Workshop Materials and the DRAINS Interface</p>

## PROGRAM: Module 1

This module covers introductory content, DRAINS Modelling (constructing, designing, optimising & analysing), and an exploration of additional hydrological models – plus open channels, creeks and headwalls.

### Session 1: Introduction to DRAINS

*Tuesday 20 August*

Morning Session **9:30am to 10:45am** and **11:00am to 12:30pm** (including 15-minute break)

- Recap with Q&A of Pre-Workshop ARR Seminar
- The DRAINS Interface
- Overview of DRAINS Databases (Pipe, Pit & Overflow Routes)
- ARR 2019 Initial Loss - Continuing Loss (IL-CL)
- Importing DXF
- Entering Pits and Pipes

### Session 2: Constructing a DRAINS Model

*Tuesday 20 August*

Afternoon Session **1:30pm to 4:00pm**

- Entering Catchments
- DRAINS Overflow Routes
- Running DRAINS and Reviewing Results
- Design Run notes and recommendations
- Survey data defining surface levels and services
- Exporting and importing information from spreadsheets
- Long-sections

### Session 3: Designing, Optimising & Analysing a DRAINS Model

*Wednesday 21 August*

Morning Session **9:30am to 10:45am** and **11:00am to 12:30pm** (including 15-minute break)

- DRAINS Pipe, Pit and Overflow route Data Base property sheet
- Automatic estimation of pit pressure change coefficients
- Optimising the design
- Lite Hydraulic vs Full Unsteady Hydraulic Models
- Splitting flows with overflow routes
- Flood Mapping with the DRAINS Full Unsteady Hydraulic Model

## **Session 4: Exploring Other Hydrological Models & Open Channels, Creeks & Headwalls**

*Wednesday 21 August*

Afternoon Session **1:30pm to 4:00pm**

- Large drainage networks with open channel systems & headwalls
- Storage Network Routing Module (SNRM) – using the RORB, RAFTS & WBNM Hydrological models in DRAINS
- Horton ILSAX hydrological model
- Q&A

## **PROGRAM: Module 2**

This module covers On-Site Detention Systems (OSDs), including an introduction, examples and configuration of OSDs using infiltration.

## **Session 5: On-Site Detention Systems (Part 1 - introduction and presentations)**

*Tuesday 22 August*

Morning session 9:30 am to 10:45 am and 11:00am 12:30 pm (including 15-minute break)

- OSD Presentations
- High Early Discharge systems
- Aboveground and Below ground OSD systems
- OSD Examples

## **Session 6: On-Site Detention Systems (Part 2 – Configure OSD including infiltration)**

*Tuesday 22 August*

Afternoon Session 1:30 pm to 4:00 pm

- Small subdivision combined OSD and RWT
- Multi-Chamber Detention Basin with Weir and Orifice
- Modelling underground infiltration storages (soakwells, StormTech)

## INSTRUCTORS

### Dr Benjamin Kus

Chief Executive Officer

Dr Benjamin Kus is an astute and accomplished engineer, business manager, academic and educator, with over 20 years of experience in urban development, stormwater design, on-site detention and flood studies.

He is a contributing author of the national Australian Rainfall and Runoff (ARR 2019) guidelines having authored Chapter 5 'Stormwater Conveyance', in Book 9 'Runoff in Urban Areas', has completed a PhD in Engineering – Membrane Technology and Water Harvesting, and is a published author of over a dozen journal papers.

Ben is guiding the nation's next generation of engineers as a guest lecturer at the University of Wollongong, Charles Darwin University and University of Technology Sydney.



### Hossein Ansari

Technical Manager & Principal Engineer

Hossein is a Civil Engineer with over 20 years of experience in both the public and private sectors, previously working as a Senior Design Officer at Sutherland Shire Council and as a Drainage Investigation Engineer at City of Botany Bay Council.

In his capacity as a consultant, Hossein has been providing services as a Civil / Hydraulic Engineer to a number of consulting firms since 2007.

Hossein's experience covers roads, drainage, overland flow path studies, and Water Sensitive Urban Design (WSUD) projects, from inception to detailed design and construction.

His major interests include hydrological and hydraulic modelling and design utilising various computer software programs including DRAINS, HEC-RAS, ILSAX, Civil 3D, AutoCAD, Civil Site Design, MapInfo, QGIS, ArcMap and other GIS software.



## CONTACTING WATERCOM

For support on workshop content, or enquires about training workshops, including custom or private workshops, individual or corporate e-learning packages, please email [training@watercom.com.au](mailto:training@watercom.com.au) or call the Watercom office on 02 6649 8005.

General software support for DRAINS is available by lodging a support ticket on the Watercom Website: [watercom.com.au/support/](http://watercom.com.au/support/)

DRAINS Quotes and Purchases are available by submitting a quote request on the Watercom Website: [watercom.com.au/pricing/](http://watercom.com.au/pricing/)

Head Office: Level 11, 66 Clarence Street, Sydney, NSW 2000

Office Phone: +612 6649 8005

Postal Address: PO Box 199, Port Kembla, NSW 2505

Website: [www.watercom.com.au](http://www.watercom.com.au)

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