



WE130: WaterGEMS: Advanced Water Distribution Modeling & Analysis

Training Description:

WaterGEMS is a powerful hydraulic and water quality modeling software widely used for the design, analysis, and optimization of water distribution systems. This intensive five-day training program equips participants with both foundational and advanced skills required to build, calibrate, analyze and optimize water network models.

The training course combines theory, guided demonstrations and practical hands-on exercises. Participants will learn how to simulate real-world water distribution systems, evaluate system performance, diagnose operational issues and develop data-driven solutions. By the end of the training course, attendees will be able to confidently apply WaterGEMS for engineering design, operational analysis and long-term planning.

Training Objectives:

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

- ✓ Understand hydraulic principles behind water distribution modeling
- ✓ Build and manage WaterGEMS models efficiently
- ✓ Perform steady-state and extended period simulations
- ✓ Analyze pressure, flow, demand, and system behavior
- ✓ Model water quality and constituent transport
- ✓ Calibrate models using field data
- ✓ Conduct scenario analysis and system optimization
- ✓ Evaluate energy use and pump operations
- ✓ Apply best practices in network design and troubleshooting

Training Designed for:

This training course is intended for Water distribution engineers, Civil and hydraulic engineers, Utility planners and operators, Infrastructure consultants, Municipal engineers, Network designers, Asset management professionals and Engineering students specializing in water resources.

Basic knowledge of hydraulics or water systems is helpful but not mandatory.

Training Requirement:

“Hands 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 Program:

DAY ONE:

- ❖ Fundamentals & Model Development
- ❖ Introduction and model building essentials
 - Introduction to water distribution modeling
 - Overview of WaterGEMS interface and workflow

- Hydraulic theory refresher
- Creating a new project
- Network elements (pipes, junctions, reservoirs, tanks, pumps, valves)
- Data input requirements
- Building a basic network model
- Assigning demands and elevations
- Units, libraries, and project settings
- Running initial simulations
- Interpreting basic results

❖ **Practical Exercises:**

- Creating a simple distribution network
- Running steady-state analysis

DAY TWO:

❖ **Hydraulic Analysis & Extended Period Simulation**

- Steady-state vs extended period simulation (EPS)
- Demand patterns and time variation
- Tank operation modeling
- Pressure and flow analysis
- Identifying hydraulic bottlenecks
- Fire flow analysis
- Critical node assessment
- Pressure zone evaluation
- Troubleshooting common modeling errors

❖ **Practical Exercises:**

- EPS modeling
- Fire flow scenario analysis

DAY THREE:

❖ **Advanced Components & Water Quality Modeling**

- Pump modeling and curves
- Valve types and controls
- Operational controls & rules
- Energy consumption analysis
- Water age simulation
- Chlorine decay modeling
- Constituent transport principles
- Source tracing
- Mixing in tanks
- Quality result interpretation

❖ **Practical Exercises:**

- Pump scheduling
- Chlorine/water age simulation

DAY FOUR:

- ❖ **Model Calibration & Scenario Analysis**
 - Importance of calibration
 - Field data requirements
 - Calibration techniques
 - Adjusting demands, roughness, and parameters
 - Sensitivity analysis
 - Creating and managing scenarios
 - Alternative designs & comparisons
 - What-if analysis
 - System performance evaluation
- ❖ **Practical Exercises:**
 - Model calibration case study
 - Scenario comparison

DAY FIVE:

- ❖ **Optimization, Design & Best Practices**
 - Pipe design and sizing
 - Pump optimization
 - Energy cost reduction strategies
 - Criticality and reliability analysis
 - Capacity assessment
 - System expansion planning
 - Asset management insights
 - Best modeling practices
 - Common pitfalls and professional tips
 - Final integrated workshop
- ❖ **Practical Exercises:**
 - Network optimization challenge
 - Comprehensive project simulation
- ❖ **Course Conclusion**
- ❖ **POST-ASSESSMENT and EVALUATION**

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):

CMCT 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:

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:

Aisha Relativo - Training & Career Development Manager

aisha@cmc-me.com / training@cmc-me.com

Tel.: +971 2 665 3945 or +971 2 643 6653 | Mob.: +971 52 2954615