

## WaterCAD/GEMS V8i, Water Distribution Design & Modeling, Full (metric)

**Course Type:** Classroom Learning: Hands-on

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**Products Covered:** WaterCAD/GEMS

**Target Audience:** Civil Engineer; Civil Engineering Technician; Consultant; Designer; Design Engineer; GIS Specialist; Hydraulics Engineer; Piping Designer; Planner; Plant Engineer; Project Manager; Site Developer

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**Course Description:**

This intensive 5 day training course begins with the basics of hydraulics theory as it applies to water distribution modeling, then takes students through more advanced topics such as: working with multiple scenarios and alternatives; model calibration; pump selection; energy and cost studies; extended-period simulation; fire flow analysis; water quality analysis; and finally identifying critical links or shortfalls within a water system. Students will become familiar with WaterCAD/WaterGEMS and use the software to reinforce concepts with case studies. Additional days cover: advanced water distribution modeling software tools for automating system calibration and design; pump scheduling; and model skeletonization. Also covered are specific topics such as: building models from geospatial and other data sources; developing system demands from geospatial data on land use or population, etc.; importing elevation data from digital elevation models; introductory material on customizing and extending WaterCAD/WaterGEMS using WaterObjects; and also bringing SCADA data into a model. Other topics covered during the advanced portion of the class include leveraging the interoperability of WaterCAD/WaterGEMS to take advantage of the industry's leading CAD/GIS platforms.

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By the end of this class students will be able to:

**Learning Objectives:**

- apply the basic principles of water distribution modeling
  - gain essential knowledge for water system design, operation, and troubleshooting
  - apply WaterCAD/WaterGEMS models to solve common water distribution system problems
  - develop a deeper understanding of model creation and analysis using WaterCAD/WaterGEMS
  - increase productivity by using automated approaches to complete common modeling tasks
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**Course Topics:**

- Building functional models using existing data
- Locating critical pipe segments, analyzing their impact and remediating them within a water system
- Troubleshooting an existing distribution system model for closed valves
- Skeletonizing an existing water model effectively for use in master planning
- Using models for solving complex design and operation control problems
- Determining the most applicable method(s) to simulate system demand and where that demand data may come from
- Performing energy audits on a water distribution system and improving operation
- Calibrating distribution system models automatically with field data such as pressure recorder readings, tank levels, pump status, flow meter data
- Answering design questions such as: How big should the tank or elevated tower be? How many pumps are enough? What pump curve is best for a particular application? Is a variable speed pump better for that application? What should the most energy efficient controls and logic be?
- Analyzing various Water Quality parameters using Extended-period simulations: chlorine or chloramine decay, disinfection by products (DBP's) formation, tracer studies and constituent mixing within the system
- New! Set up and analyze a flushing program using conventional and unidirectional flushing

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**Course Details:**

**Course Prerequisites:** There are no formal prerequisites for this course, although some familiarity with water distribution systems will be helpful. The course material has been developed for the WaterCAD/GEMS V8i platform, at a minimum the Version 08.11.00.30. Modelers currently using versions prior to WaterCAD/GEMS V8i, version 08.11.00.30, are strongly encouraged to consider upgrading today and start taking advantage of the latest features.

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Learning Units: 40

Display LUs in: hours

Accreditations:

Organization:	Value:
Bentley Institute 	40 Bentley LU
Bentley Contact Hours	35 CONTACT HOURS