BOOST
THE LEADING TRAINING PROVIDER

Civil Engineering

Applied GIS & Mapping in Water Sector

Course Introduction

The course will comprise a general and specific roles and applicability of how the GIS & Mapping can optimize the operation and maintenance of the Water Network **(Transmission and Distribution)**.

This course will tackle different relative disciplines and corresponded issues like; GIS & GPS Functionality in Water Network **(Transmission and Distribution)**, Geographic Coordinate System & Scale, Projected Coordinate Systems, Geodatabase of Water Network (Transmission and Distribution), Acquiring Data & Data Collection of Water Network, Water Network (Transmission and Distribution) Mapping Methodology, The Role of the GIS/Mapping in Optimizing the Operation and Maintenance of the Water Network, and International Case Studies & Best Practices World Wide. Moreover, this course will cover the GIS role in the field force automation (FFA) and control/monitoring systems.

Target Audience

- Planning Engineer
- Reservoir Engineer
- Structural Engineer
- Welding Engineer

Learning Objectives

- Understand, and gain experience on how the GIS and mapping can play a significant role in the sector of Water Network (Transmission and Distribution).
- Particularly, in the optimization of the operation, regular maintenance, predictive maintenance, proactive maintenance, pipeline and piping inspection, repair in a

manner that follows international best practice and be aware of the kind of tools appropriate for each corresponding task.

- The course will cover the most advanced techniques used in data collection, data processing & handling, state of the art GIS and mapping modules applied in that context.
- Furthermore, the course will cover also the cutting age technology applied in the geo-database and scheme of the Water Network (Transmission and Distribution) affiliated with slandered attributes.
- Noteworthy, the GIS role in the field force automation (FFA) and control/monitoring systems will be explained. Moreover, significant best practices and tangible case studies will be discussed in details as well.

Course Outline

- **DAY 01**

  Module (01) Introduction to GIS Functionality in Water Network (Transmission and Distribution)

  - 1.1 What is GIS?
  - 1.2 GIS Components
  - 1.3 GIS in Water Network (Transmission and Distribution)
  - 1.4 Characteristics of Spatial Data
  - 1.5 Water Network (Transmission and Distribution) Data Modelling
  - 1.6 Different Modelling Algorithm of the Water Network
  - 1.7 Different Techniques of Manipulation and Analysis
  - 1.8 Water Network (Transmission and Distribution) Ddatabases & Attributes
  - 1.9 Spatial Data Infrastructure (SDI) for Water Network (Transmission and Distribution)
  - 1.10 GIS Application Areas for Water Network (Transmission and Distribution)

- **Day 02**

  Module (02) Introduction to GPS Application in Water Network (Transmission and Distribution)

- 2.1 What is the Global Positioning System (GPS)?
- 2.2 How GPS Works?
- 2.3 Different Types and Accuracy Levels of Receiver(s)
- 2.4 User Segment
- 2.5 Sources of GPS Errors
- 2.6 Sources of Signal Interference
- 2.7 Good Satellite Geometry
- 2.8 Map Datum
- 2.9 Real Time Differential GPS
- 2.10 GPS Wide Area Augmentation System (WWAS)
- 2.11 GPS/GIS Functionality in Water Network (Transmission and Distribution)

Module (03) Geographic Coordinate System & Scale

- 3.1 Working with Data in Different Geographic Coordinate Systems
- 3.2 Choose an Appropriate Geographic Transformation
- 3.3 Map Projections and Scale Proper for Water Network (Transmission and Distribution)

• **Day 03**

Module (04) Projected Coordinate Systems

- 4.1 Types of Map Projections
- 4.2 Projecting Coordinates for Water Network (Transmission and Distribution)
- 4.3 Projections and Distortion in Water Network (Transmission and Distribution)
- 4.4 Classifying Projections According to the Properties They Preserve
- 4.5 Reasons for Using a Specific Projected Coordinate System
- 4.6 Choose an Appropriate Projection for Water Network (Transmission and Distribution)

Module (05) Geodatabase of Water Network (Transmission and Distribution)

- 5.1 Spatial Data Formats of Water Network (Transmission and Distribution)

- 5.2 Geodatabase Data Structure of Water Network (Transmission and Distribution)
- 5.3 Personal Vs. Enterprise Geodatabase
- 5.4 Components of Geodatabase
- 5.5 Building Geodatabase of Water Network (Transmission and Distribution)
- 5.6 Specific Scheme and Attributes for Water Network (Transmission and Distribution)

- **Day 04**

Module (06) Acquiring Data & Data Collection of Water Network (Transmission and Distribution)

- 6.1 Different Types of Data Collection Methodology
- 6.2 Different Types of Data Sources
- 6.3 Different Types of Data format of Water Network (Transmission and Distribution)
- 6.4 Data considerations in Water Network (Transmission and Distribution)
- 6.5 Data Collection Instrumentation & Various Techniques
- 6.6 Data Collection Verification
- 6.7 Data Collection Quality Control (QC) & Quality Assurance (QA)
- 6.8 Best Practise in Data Collection of Water Network (Transmission and Distribution

Module (07) Water Network (Transmission and Distribution) Mapping Methodology

- 7.1 How to Prepare an Image Map
- 7.2 Data Types and Data Conversions
- 7.3 Raster Formats & Vector Format
- 7.4 Vector Feature Types & Classification
- 7.5 Spatial Data Criteria of Water Network (Transmission and Distribution)
- 7.6 Feasibility Checking
- 7.7 Real Time Mapping in Integration with Collection of Data & Surveying Techniques and Advanced Methodology

- 7.8 Real Time GPS and Handhelds Different Techniques of Data Collection in Relation to GIS Mapping
- 7.9 Mapping QS & QA and Field Verification Survey by GPS
- 7.10 Prepare Database & Multiuser Geodatabase
- 7.11 Water Network (Transmission and Distribution) & Fitting Schemas

- **Day 05**

Module (08) The Role of the GIS/Mapping in Optimizing the Operation and Maintenance of the Water Network (Transmission and Distribution)

- 8.1 Role of the GIS in Optimizing the Operation
- 8.2 Role of the GIS in optimizing Control & Inspection
- 8.3 Maintenance According to GIS Map/System
- 8.4 Role of the GIS in Predictive, Proactive, and Regular Maintenance
- 8.5 Role of the GIS in Network Spatial Asset Inventories & Management
- 8.6 Enterprise Geo-Database of "As Built Drawing" for Water Network.
- 8.7 International Case study: Preparation of Base-map & As Built Drawing & Survey and Investigation of Water Network & Collect GPS data of Transmission and Distribution Network.
- 8.8 International Case study: GIS Role in Water Network Project Implementation & Supervision & Generation of as Built Drawing & QC/QA of Drawings.
- 8.9 International Case Study: Water Network GIS Data Development (Converting Hardcopy/CAD Plans/As Built Drawings) into GIS database & ArcGIS Shape Files into a Geodatabase
- 8.10 International Case Study: Provide Full Functionality of your Water Network GPS/GIS tools. Asset Management and Environmental Monitoring
- 8.11 Generation of Water Network (Transmission and Distribution) Map-Books (Generation of Water Network System Maps in Hard Copy and Digital Format Viewable on Web-Based System)

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
June 23, 2025	June 27, 2025	5 days	4250.00 $	UAE - Dubai
Sept. 15, 2025	Sept. 19, 2025	5 days	4250.00 $	UAE - Abu Dhabi
Dec. 29, 2025	Jan. 2, 2026	5 days	4950.00 $	Thailand - Bangkok