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Course Name

Applied GIS & Mapping in Water Sector

Sector Name

Civil Engineering

Document Type

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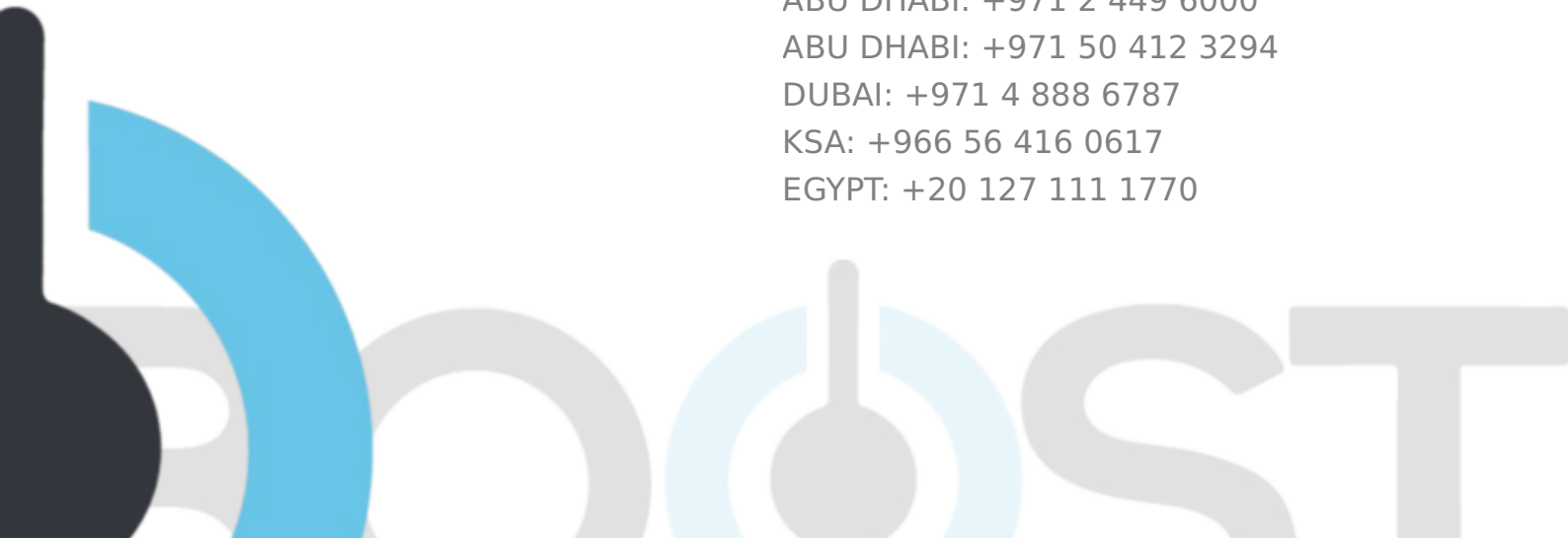
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Applied GIS & Mapping in Water Sector

Course Introduction

The course will comprise a general and specific roles and applicability of how 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.

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Target Audience

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

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Learning Objectives

- ✓ Understand and gain experience on how 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, and 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 also cover the cutting-edge 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 detail as well.

Applied GIS & Mapping in Water Sector

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 Algorithms of the Water Network
- ✓ 1.7 Different Techniques of Manipulation and Analysis
- ✓ 1.8 Water Network (Transmission and Distribution) Databases & Attributes
- ✓ 1.9 Spatial Data Infrastructure (SDI) for Water Network (Transmission and Distribution)
- ✓ 1.10 GIS Application Areas for Water Network (Transmission and Distribution)

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Course Outline

✓ 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)

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Course Outline

✓ 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 a Geodatabase of Water Network (Transmission and Distribution)
- ✓ 5.6 Specific Scheme and Attributes for Water Network (Transmission and Distribution)

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Course Outline

✓ 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 Practice 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

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Course Outline

✓ 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)

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Sept. 21, 2026	Sept. 25, 2026	5 days	4250.00 \$	UAE , Abu Dhabi
June 28, 2027	July 2, 2027	5 days	4250.00 \$	UAE , Dubai
Jan. 25, 2027	Jan. 29, 2027	5 days	4250.00 \$	UAE , Dubai
Dec. 28, 2026	Jan. 1, 2027	5 days	4950.00 \$	Thailand , Bangkok

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