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COURSE BROCHURE

Advanced GIS for Smart Cities and Urban Digital Twins Course

19 – 30 September 2027
Manama

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Registered in the United Kingdom and Saudi Arabia

Advanced GIS for Smart Cities and Urban Digital Twins Course

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Advanced GIS for Smart Cities and Urban Digital Twins is a 2-week training course for smart city officers, urban planners, municipal GIS teams and digital twin leads, and it ends with a smart city spatial data platform design for one urban service. Municipalities now collect sensor, permit and service data faster than their departments can join it to a shared map. Jupiter Prime Training frames Advanced GIS for Smart Cities and Urban Digital Twins around running real services, not showcase visualisations.

Why GIS for Smart Cities and Urban Digital Twins Matters Now

Three groups shape the field today. Residents expect responsive services and visible progress on waste, water, parking and street lighting; utility and mobility operators stream sensor readings that only make sense when placed in location; and city leaders want three-dimensional digital twins that test a development or a flood before it happens. A municipality that links these through one spatial backbone can dispatch crews faster, explain decisions with evidence and avoid duplicated systems. One that builds disconnected dashboards ends with sensors nobody maintains, models that age within months and departments that still email spreadsheets to each other.

Who Gains Most from GIS for Smart Cities and Urban Digital Twins

- Officers who shape smart city roadmaps and choose which services go digital first
- Planners who test development proposals against 3D city models and urban indicators
- Municipal GIS specialists who integrate sensor feeds, asset layers and service requests
- Digital twin leads who manage city models, update cycles and simulation scenarios
- Service owners in waste, water, lighting or mobility who act on live spatial alerts

A municipal digital unit gains most when its GIS specialists, planners and one service owner attend together and design the same urban platform from both sides.

GIS for Smart Cities and Urban Digital Twins Capabilities

Participants learn to connect streaming urban signals, city models and service workflows into one spatial picture that crews, planners and leaders can each act on.

- Design a spatial data architecture linking sensors, assets and service requests — municipal digital units
- Build real-time dashboards with location alerts and thresholds — service control rooms
- Specify 3D city model content, level of detail and update cycles — planning and permitting teams
- Apply spatial analytics to service demand, coverage and response times — operations managers
- Assess data sharing, privacy and interoperability choices — city leadership and partners
- Test development and hazard scenarios inside a digital twin — planning committees

Key GIS for Smart Cities and Urban Digital Twins Terms

- Urban Digital Twin — a living virtual model of city assets and conditions, updated from real data and used to test decisions.
- 3D City Model — a three-dimensional representation of buildings, terrain and infrastructure at an agreed level of detail.
- Sensor Feed — a continuous stream of readings, such as fill levels, flow or traffic counts, tagged with location and time.
- Real-Time Dashboard — a live display of spatial indicators and alerts that service teams monitor and act on.
- Geofence — a virtual boundary that triggers an alert or action when a tracked asset or event enters or leaves it.
- Spatial Data Platform — the shared environment where city layers, feeds and applications are stored, connected and published.

GIS for Smart Cities and Urban Digital Twins Day by Day

Day 1: The Smart City Spatial Context

- Smart City Service Maturity — Choosing Which Services Go Digital First
- Urban Stakeholder Mapping — Aligning Departments, Operators and Residents
- Location as Shared Key — Joining Addresses, Parcels and Assets
- Use Case Canvas — Defining Outcomes for One Urban Service
- Existing System Inventory — Spotting Duplicated Maps and Databases

Day 2: Urban Sensor Data

- Sensor Types and Placement — Matching Devices to Service Questions
- Internet of Things Data Streams — Ingesting Readings With Location and Time
- Stream Filtering and Aggregation — Reducing Noise Before Display
- Sensor Health Monitoring — Detecting Silent or Faulty Devices
- Mobile and Crowd Sources — Adding Citizen Reports to the Map

Day 3: Real-Time Dashboards and Alerts

- Operational Dashboard Design — Choosing Indicators for Control Rooms
- Geofences and Threshold Rules — Triggering Alerts by Location
- Crew Dispatch Integration — Routing Field Teams From Alerts
- Service Level Indicators — Tracking Response Times by District
- Alert Fatigue Controls — Prioritising What Operators See

Day 4: 3D City Models

- Level of Detail Choices — Matching Model Depth to Planning Use
- Building and Terrain Capture — Using Photogrammetry and Laser Scanning
- 3D Model Attribution — Linking Height, Use and Ownership
- BIM to GIS Integration — Bringing Building Models Into City Context
- Model Update Cycles — Keeping Geometry Current With Permits

Day 5: Building the Urban Digital Twin

- Digital Twin Architecture — Connecting Static Models and Live Feeds
- Simulation Layers — Testing Flood, Heat and Shadow Effects
- Development Impact Testing — Assessing Massing Against Skyline and Access
- Twin Ownership Roles — Assigning Stewards for Each Layer
- Fit-for-Purpose Twin Scope — Avoiding Models Nobody Maintains

Day 6: Spatial Analytics for Municipal Services

- Service Demand Hot Spots — Locating Clusters of Complaints and Faults
- Coverage and Catchment Analysis — Testing Reach of Facilities
- Route Optimisation for Collection — Cutting Waste Round Distances
- Predictive Maintenance Mapping — Ranking Assets by Failure Likelihood
- Equity of Service Indicators — Comparing Neighbourhood Outcomes

Day 7: Interoperability and Data Sharing

- Open Data Formats and Services — Publishing Layers Others Can Use
- Application Programming Interfaces — Connecting City Systems Safely
- Data Sharing Agreements — Setting Terms With Operators and Partners
- Privacy by Design — Aggregating Location Data About People
- Cyber Resilience of Feeds — Protecting Sensors and Platforms

Day 8: Platform Design and Operations

- Cloud and On-Premises Options — Weighing Control Against Scalability
- Spatial Data Platform Layers — Separating Storage, Services and Apps
- Master Data for City Assets — Agreeing One Authoritative Record
- Platform Operating Model — Funding, Staffing and Support Roles
- Performance Indicators for the Platform — Measuring Use and Reliability

Day 9: Engaging Citizens and Leaders

- Public Story Maps — Explaining Projects to Residents
- Participatory Mapping Tools — Collecting Local Knowledge
- Executive City Indicators — Reporting Progress to Leadership
- Scenario Presentation in 3D — Showing Options in Council Meetings
- Benefit Tracking Registers — Linking Platform Use to Service Gains

Day 10: Practising the Smart City Spatial Data Platform Design

- Service Use Case Selection — Applying the Use Case Canvas to One Service
- Feed and Layer Specification — Applying Sensor and 3D Model Choices
- Dashboard and Alert Mock-Up — Applying Geofence and Threshold Rules
- Governance and Sharing Plan — Applying Interoperability and Privacy Methods
- Smart City Spatial Data Platform Design — Completing the Work Product

Applying GIS for Smart Cities and Urban Digital Twins After the Course

- Map every sensor, asset layer and service request source for one urban service and mark gaps in the shared location key
- Prototype an operational dashboard with geofence alerts for that service and test it with the control room for a fortnight

GIS for Smart Cities and Urban Digital Twins Questions FAQ

What is Advanced GIS for Smart Cities and Urban Digital Twins and why does it matter now?

Advanced GIS for Smart Cities and Urban Digital Twins is the spatial integration of sensor feeds, 3D city models and service data into one platform. It matters now because municipalities need faster, evidence-based services while their data multiplies across departments.

Which roles gain most from Advanced GIS for Smart Cities and Urban Digital Twins?

Smart city officers, urban planners, municipal GIS teams and digital twin leads gain most. They choose services to digitise, integrate feeds and models, and turn spatial alerts into crew actions and planning decisions.

How does Advanced GIS for Smart Cities and Urban Digital Twins differ from a general GIS analysis course?

It focuses on live urban feeds, 3D city models, digital twins and municipal platforms rather than desktop geoprocessing. A general analysis course builds analytical workflows; this course designs the shared city environment those workflows feed.

What do you bring back from Advanced GIS for Smart Cities and Urban Digital Twins?

You bring back a smart city spatial data platform design for one urban service, covering feeds, layers, dashboards, alerts, sharing rules and an operating model ready to discuss with leadership.

GIS for Smart Cities and Urban Digital Twins: The Way Forward

The smart city spatial data platform design first informs which urban service is connected end to end, from sensor to crew dispatch. Digital units, service owners and city leaders use it to agree budgets and responsibilities. After its first months of operation, revisit the twin scope and alert thresholds, because real service patterns show which layers earn their upkeep.