QGIS for Infrastructure Training Course

Professional Development Training Course Outline

Category	Construction Institute	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

QGIS for Infrastructure Training Course is designed to develop advanced Geospatial Information System (GIS) skills for professionals involved in infrastructure planning, engineering, construction, transportation, utilities, urban development, and asset management. This course provides hands-on expertise in open-source GIS technology, spatial data analytics, remote sensing integration, digital mapping, infrastructure lifecycle management, and geospatial decision-making using QGIS. Participants will learn how to transform complex infrastructure datasets into actionable insights through spatial analysis, network modelling, geodatabase development, field data collection, and automated GIS workflows.

The program focuses on practical applications of QGIS in modern infrastructure projects by integrating smart city solutions, sustainable development planning, BIM-GIS integration, artificial intelligence (AI) in geospatial workflows, and location intelligence. Through real-world projects and case studies, learners will gain the ability to create professional maps, manage infrastructure assets, analyze environmental impacts, optimize transportation networks, and support evidence-based engineering decisions. This training empowers organizations to improve project efficiency, operational performance, infrastructure resilience, and digital transformation outcomes.

Programme Curriculum

QGIS for Infrastructure Training Course

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Course Duration

5 days

Course Objectives

By the end of the QGIS for Infrastructure Training Course, participants will be able to:

1. Develop advanced skills in open-source GIS technology and infrastructure mapping workflows.
2. Understand spatial data management for engineering and infrastructure projects.
3. Create professional-quality digital infrastructure maps and geospatial visualizations.
4. Perform advanced spatial analysis and location intelligence for decision-making.
5. Build and manage GIS databases and infrastructure asset inventories.
6. Apply QGIS tools for transportation network analysis and route optimization.
7. Integrate remote sensing, satellite imagery, and drone data into infrastructure studies.
8. Apply BIM-GIS integration concepts for modern construction workflows.
9. Develop smart city GIS solutions for urban infrastructure management.
10. Automate repetitive GIS tasks using Python scripting and geoprocessing models.
11. Perform environmental impact assessment and sustainable infrastructure planning.
12. Improve infrastructure monitoring using real-time geospatial data analytics.
13. Develop industry-ready GIS skills for digital transformation and geospatial innovation.

Target Audience

1. Civil Engineers and Infrastructure Engineers
2. GIS Analysts and Geospatial Specialists
3. Urban Planners and Smart City Professionals
4. Transportation and Highway Engineers
5. Surveyors and Land Management Professionals
6. Utility Network and Asset Management Teams
7. Environmental Consultants and Development Specialists
8. Government Agencies and Infrastructure Project Managers

Course Modules

Module 1: Introduction to QGIS and Infrastructure GIS Fundamentals

- Understanding **GIS concepts, spatial databases, and infrastructure applications**
- Installing and configuring QGIS for professional workflows
- Exploring vector, raster, and spatial data formats
- Understanding coordinate reference systems and projections

- **Case Study:** Developing a GIS base map for a city infrastructure development project

Module 2: Spatial Data Creation and Infrastructure Mapping

- Creating and editing infrastructure layers using QGIS tools
- Digitizing roads, buildings, utilities, and engineering assets
- Managing attribute data and metadata standards
- Applying quality control techniques for spatial datasets
- **Case Study:** Mapping urban road networks and public infrastructure assets

Module 3: Geospatial Database Management for Infrastructure Assets

- Designing infrastructure-focused spatial databases
- Working with GeoPackage, PostGIS, and enterprise GIS concepts
- Managing asset inventories and maintenance records
- Applying data validation and database optimization
- **Case Study:** Developing a water pipeline asset management database

Module 4: Advanced Spatial Analysis for Engineering Applications

- Performing buffer, overlay, proximity, and network analysis
- Conducting site suitability and risk assessment studies
- Applying terrain analysis and elevation modelling
- Creating engineering decision-support maps
- **Case Study:** Selecting optimal locations for infrastructure expansion projects

Module 5: Transportation and Utility Network Analysis

- Mapping transportation systems and connectivity networks
- Performing shortest path and accessibility analysis
- Managing road, railway, and utility infrastructure datasets
- Supporting traffic planning and infrastructure optimization
- **Case Study:** Highway route optimization using QGIS network analysis

Module 6: Remote Sensing and Field Data Integration

- Integrating satellite imagery and drone-based datasets
- Processing raster data for infrastructure monitoring
- Collecting field data using mobile GIS applications
- Applying remote sensing for construction progress monitoring
- **Case Study:** Monitoring urban expansion using satellite imagery analysis

Module 7: Advanced Visualization, Automation, and Digital Workflows

- Creating professional engineering maps and dashboards
- Using QGIS plugins for advanced infrastructure analysis
- Automating workflows with graphical models and Python
- Integrating GIS with BIM and digital twin concepts
- **Case Study:** Creating a digital infrastructure monitoring platform

Module 8: Infrastructure Project Applications and Capstone Project

- Developing complete GIS workflows for infrastructure projects

- Applying GIS for smart cities and sustainable development
- Managing infrastructure lifecycle information
- Presenting professional GIS reports and map outputs
- **Case Study:** Complete infrastructure planning project using QGIS

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price

23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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