Smart Infrastructure Design Training Course

Professional Development Training Course Outline

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

Course Introduction

Smart Infrastructure Design is a cutting-edge discipline that integrates Artificial Intelligence (AI), Internet of Things (IoT), Building Information Modeling (BIM), Digital Twins, and Sustainable Engineering to create resilient, efficient, and future-ready urban systems. This training course is designed to equip professionals with advanced skills in planning, designing, and managing smart cities, intelligent transportation systems, green infrastructure, and data-driven urban ecosystems. With the rise of Industry 4.0, climate-smart development, and ESG-driven infrastructure investment, the demand for experts in smart infrastructure has grown exponentially across global markets.

Smart Infrastructure Design Training Course provides a comprehensive pathway to mastering next-generation infrastructure technologies, enabling learners to design integrated systems that optimize energy consumption, reduce environmental impact, enhance urban mobility, and improve quality of life. Participants will gain hands-on exposure to GIS analytics, cloud-based infrastructure platforms, predictive maintenance systems, and real-time sensor networks, aligning their expertise with global standards in sustainable urban development, smart governance, and digital transformation of infrastructure systems.

Programme Curriculum

Smart Infrastructure Design Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Master Smart City Design Frameworks using AI & IoT integration
2. Develop expertise in BIM (Building Information Modeling) for infrastructure planning
3. Understand Digital Twin Technology for real-time infrastructure simulation
4. Apply GIS-based spatial analytics for urban planning
5. Design sustainable and climate-resilient infrastructure systems
6. Implement smart transportation and mobility systems
7. Optimize infrastructure using data-driven decision-making models
8. Integrate renewable energy systems into urban infrastructure
9. Learn predictive maintenance using AI & machine learning
10. Apply cloud computing for infrastructure management systems
11. Develop skills in smart water and waste management systems
12. Understand cybersecurity in smart infrastructure networks
13. Align infrastructure projects with ESG and net-zero carbon goals

Target Audience

1. Civil Engineers
2. Urban Planners
3. Infrastructure Consultants
4. Smart City Project Managers
5. Architecture Professionals
6. Government Urban Development Officers
7. Environmental Engineers
8. ICT & IoT Systems Engineers

Course Modules

Module 1: Smart Infrastructure Fundamentals

- Overview of smart infrastructure ecosystem
- Evolution from traditional to smart cities
- Role of AI, IoT, and Big Data
- Smart infrastructure lifecycle management
- Standards and global frameworks
- **Case Study:** Singapore Smart Nation initiative infrastructure transformation

Module 2: BIM & Digital Twin Technology

- BIM fundamentals and applications
- 3D modeling for infrastructure projects
- Digital Twin simulation techniques
- Real-time infrastructure monitoring systems
- Integration of BIM with AI analytics
- **Case Study:** London Crossrail BIM implementation project

Module 3: Smart Urban Planning & GIS

- GIS mapping for urban development
- Spatial data analytics for infrastructure design
- Land-use optimization strategies
- Smart zoning and city expansion planning
- Geospatial AI applications
- **Case Study:** Barcelona smart urban planning system

Module 4: Intelligent Transportation Systems

- Smart traffic management systems
- IoT-enabled transport networks
- Autonomous vehicle infrastructure design
- Public transport optimization models
- Mobility-as-a-Service (MaaS) frameworks
- **Case Study:** Dubai Smart Traffic Control System

Module 5: Sustainable & Green Infrastructure

- Green building design principles
- Renewable energy integration
- Carbon-neutral infrastructure planning
- Water-sensitive urban design
- Climate resilience engineering
- **Case Study:** Masdar City sustainable development project (UAE)

Module 6: Smart Utilities & Energy Systems

- Smart grids and energy distribution systems
- IoT-based water management systems
- Smart waste management solutions
- Energy efficiency optimization tools
- Infrastructure automation systems
- **Case Study:** Amsterdam Smart Energy Grid

Module 7: AI, Data Analytics & Predictive Infrastructure

- Machine learning in infrastructure planning
- Predictive maintenance systems
- Big data analytics for urban systems
- Cloud-based infrastructure monitoring
- Real-time decision support systems

- **Case Study:** New York City infrastructure predictive analytics program

Module 8: Cybersecurity & Smart Governance

- Cybersecurity in smart infrastructure
- Data privacy and protection frameworks
- Smart governance models
- Digital infrastructure risk management
- Blockchain applications in infrastructure
- **Case Study:** Estonia e-Governance smart infrastructure model

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:

Register Online Now

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