Computational Urban Simulation 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

Computational Urban Simulation is an advanced interdisciplinary field that combines urban planning, data science, artificial intelligence, and geospatial analytics to model, simulate, and optimize urban environments. Computational Urban Simulation Training Course equips participants with cutting-edge skills in urban systems modeling, smart city analytics, and simulation-driven decision-making. By leveraging big data, GIS platforms, machine learning, and agent-based modeling, learners will gain the ability to analyze complex urban dynamics such as mobility patterns, land-use change, infrastructure demand, and sustainability transitions.

In an era of rapid urbanization and smart city transformation, computational urban simulation has become essential for evidence-based planning and resilient city design. This course provides hands-on experience with industry-standard tools and real-world datasets, enabling participants to design predictive urban models, simulate policy interventions, and evaluate future city scenarios. It bridges theory and practice to empower professionals to shape data-driven, sustainable, and intelligent urban futures.

Programme Curriculum

Computational Urban Simulation Training Course

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Course Duration

5 days

Course Objectives

1. Master urban digital twins development
2. Apply AI-powered urban modeling techniques
3. Analyze smart city infrastructure systems
4. Build agent-based simulation models
5. Utilize GIS spatial analytics for urban planning
6. Develop predictive mobility flow simulations
7. Integrate big data urban analytics pipelines
8. Design climate-resilient urban systems
9. Implement machine learning for land-use prediction
10. Evaluate transportation network optimization models
11. Simulate urban population growth scenarios
12. Apply sustainable city planning frameworks
13. Enhance data-driven policy decision systems

Target Audience

1. Urban planners and city development officers
2. Civil and environmental engineers
3. Data scientists and AI engineers
4. GIS analysts and geospatial specialists
5. Smart city project managers
6. Government policy makers and consultants
7. Architecture and urban design professionals
8. Research scholars in urban studies and computational modeling

Course Modules

Module 1: Foundations of Computational Urban Systems

- Urban systems theory and complexity science
- Introduction to computational modeling
- Role of simulation in urban planning
- Overview of smart city ecosystems
- Case Study: Singapore Smart Nation urban data framework

Module 2: GIS and Spatial Data Analytics

- Spatial data structures and mapping techniques
- GIS tools for urban analysis
- Spatial statistics and pattern detection

- Remote sensing integration
- Case Study: Land-use change analysis in Dubai

Module 3: Agent-Based Modeling in Urban Environments

- Agent-based modeling principles
- Behavioral simulation of urban populations
- Mobility and traffic behavior modeling
- Multi-agent system interactions
- Case Study: Pedestrian flow simulation in Tokyo

Module 4: Machine Learning for Urban Prediction

- Supervised and unsupervised learning in urban data
- Predictive modeling of urban growth
- Feature engineering for spatial datasets
- Neural networks for urban forecasting
- Case Study: Housing price prediction in London

Module 5: Smart Mobility and Transport Simulation

- Traffic simulation models
- Public transport optimization
- Ride-sharing system analysis
- Real-time mobility data integration
- Case Study: NYC traffic congestion optimization

Module 6: Urban Digital Twins and IoT Integration

- Concept of digital twins in cities
- IoT sensor networks in urban systems
- Real-time simulation environments
- Data synchronization techniques
- Case Study: Helsinki 3D city digital twin project

Module 7: Climate and Sustainability Simulation

- Urban heat island modeling
- Carbon footprint simulation
- Green infrastructure planning
- Climate resilience strategies
- Case Study: Climate adaptation planning in Rotterdam

Module 8: Policy Simulation and Decision Systems

- Scenario planning for urban policies
- Decision-support systems
- Impact evaluation models
- Participatory simulation tools
- Case Study: Affordable housing policy simulation in New York City

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

Start Date	End Date	Location	Price
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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