Traffic Modelling with Micro-Simulation Training Course

Professional Development Training Course Outline

Category	Traffic Management & Road Safety	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Traffic congestion, urban mobility, and intelligent transportation systems are increasingly critical challenges in modern cities. Traffic Modelling with Micro-Simulation leverages cutting-edge simulation tools to provide realistic insights into vehicular movement, traffic flow, and infrastructure performance. By simulating complex traffic scenarios, urban planners and transport engineers can optimize traffic management strategies, reduce congestion, and enhance safety. Traffic Modelling with Micro-Simulation Training Course equips participants with the skills to utilize advanced micro-simulation software, interpret traffic data, and implement practical solutions for sustainable urban mobility.

In this intensive program, participants will explore real-world traffic scenarios, conduct scenario-based simulations, and analyze performance metrics using leading-edge software tools. From signal timing optimization to intersection design, this course blends theoretical concepts with hands-on exercises, fostering data-driven decision-making. Ideal for professionals in transportation planning, traffic engineering, and smart city development, this course ensures participants gain actionable insights to improve urban traffic systems.

Programme Curriculum

Traffic Modelling with Micro-Simulation Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Master traffic flow theory and micro-simulation fundamentals for realistic modeling.
2. Develop expertise in traffic data collection, calibration, and validation techniques.
3. Implement dynamic traffic assignment and route choice modeling.
4. Design and optimize signalized and unsignalized intersections.
5. Evaluate traffic management strategies using scenario-based simulations.
6. Analyze highway and arterial performance using micro-simulation tools.
7. Integrate connected and autonomous vehicle (CAV) scenarios into traffic models.
8. Conduct safety analysis and collision prediction using simulation outputs.
9. Optimize urban mobility using intelligent transportation system (ITS) strategies.
10. Simulate pedestrian, bicycle, and multimodal traffic interactions.
11. Apply GIS-based traffic modeling for spatially accurate simulations.
12. Generate actionable reports with advanced visualization and performance metrics.
13. Implement sustainable traffic solutions for smart city planning.

Target Audience

1. Traffic and transportation engineers
2. Urban planners and city developers
3. Highway and roadway designers
4. Traffic management authorities
5. Intelligent Transportation System (ITS) professionals
6. Academic researchers in transportation engineering
7. Policy makers and infrastructure consultants
8. Civil engineering graduate students

Course Modules

Module 1: Fundamentals of Traffic Flow & Micro-Simulation

- Introduction to traffic flow theory
- Key parameters
- Micro and macro simulation approaches
- Software overview: VISSIM, Aimsun, SUMO
- **Case Study:** Urban arterial traffic flow analysis

Module 2: Traffic Data Collection & Calibration

- Manual and automated traffic counts
- Origin-Destination (OD) surveys
- Calibration techniques for micro-simulation models
- Data validation and quality assurance
- **Case Study:** Intersection simulation calibration for peak hours

Module 3: Signalized and Unsignalized Intersection Modeling

- Signal timing optimization
- Roundabouts and priority control modeling
- Pedestrian and cyclist integration
- Level of Service (LOS) evaluation
- **Case Study:** Multi-lane intersection delay reduction

Module 4: Highway & Arterial Traffic Modeling

- Freeway and arterial flow simulation
- Ramp metering and lane assignment strategies
- Congestion and bottleneck analysis
- Travel time reliability assessment
- **Case Study:** Expressway corridor congestion management

Module 5: Dynamic Traffic Assignment & Route Choice

- Route choice behavior modeling
- OD matrix estimation
- Traffic assignment algorithms
- Scenario comparison analysis
- **Case Study:** Peak vs. off-peak dynamic assignment

Module 6: ITS and Smart Mobility Integration

- Adaptive traffic signal control
- Connected and autonomous vehicle integration
- Smart parking and dynamic lane management
- Real-time traffic prediction models
- **Case Study:** Smart city traffic optimization

Module 7: Safety & Environmental Analysis

- Collision prediction and hotspot analysis
- Emission and fuel consumption estimation
- Noise and air pollution modeling
- Sustainable traffic management solutions
- **Case Study:** Accident reduction at high-risk intersections

Module 8: Reporting, Visualization & Decision Support

- Advanced dashboard creation
- Visualization techniques for stakeholders
- Performance metrics reporting
- Scenario comparison and recommendations

- **Case Study:** Policy impact assessment for urban mobility

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

Start Date	End Date	Location	Price
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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