Building Performance 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

Building Performance Simulation (BPS) is a cutting-edge discipline transforming the architecture, engineering, and construction (AEC) industry through data-driven design, energy optimization, carbon reduction, and climate-responsive building strategies. Building Performance Simulation Training Course is designed to equip professionals with advanced skills in energy modeling, daylight simulation, thermal comfort analysis, HVAC performance optimization, and Net Zero building design using industry-standard simulation tools. With the global shift toward sustainable construction, green building certification (LEED, BREEAM), and ESG compliance, BPS has become a critical competency for architects, engineers, and sustainability consultants.

This program integrates advanced computational simulation techniques, BIM integration, parametric modeling, and AI-driven building analytics to enable participants to evaluate and improve building performance at every design stage. Learners will gain practical expertise in tools such as EnergyPlus, IES-VE, DesignBuilder, OpenStudio, and Rhino Grasshopper plugins, enabling them to deliver high-performance, low-energy, and climate-resilient buildings. The course emphasizes real-world applications, enabling professionals to meet global demands for Net Zero Energy Buildings (NZEB), carbon-neutral design, and smart building technologies.

Programme Curriculum

Building Performance Simulation Training Course

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Course Duration

5 days

Course Objectives

1. Master Building Performance Simulation (BPS) fundamentals
2. Apply energy efficiency modeling techniques for sustainable design
3. Conduct advanced thermal comfort analysis (PMV/PPD metrics)
4. Optimize HVAC system performance using simulation tools
5. Integrate BIM and digital twin technology in building analysis
6. Perform daylight and solar radiation analysis
7. Develop Net Zero Energy Building (NZEB) strategies
8. Evaluate carbon footprint and embodied energy of buildings
9. Use parametric design tools for performance optimization
10. Implement climate-responsive architectural solutions
11. Apply green building certification standards (LEED, EDGE, BREEAM)
12. Analyze wind flow and natural ventilation performance
13. Utilize AI-driven predictive building analytics

Target Audience

1. Architects and architectural designers
2. Mechanical & HVAC engineers
3. Sustainability consultants
4. Energy auditors and assessors
5. Urban planners and designers
6. Construction project managers
7. BIM specialists and digital designers
8. Engineering and architecture students

Course Modules

Module 1: Fundamentals of Building Performance Simulation

- Introduction to BPS concepts
- Building physics principles
- Simulation workflow basics
- Overview of tools (EnergyPlus, DesignBuilder)

- Data input and modeling assumptions
- **Case Study:** Simulation of a low-rise office building energy baseline

Module 2: Energy Modeling & Optimization

- Energy demand calculation
- Load profiling techniques
- HVAC load optimization
- Passive design strategies
- Energy benchmarking
- **Case Study:** Energy reduction in a commercial complex using simulation

Module 3: Thermal Comfort Analysis

- PMV and PPD indices
- Adaptive comfort models
- Indoor environmental quality (IEQ)
- Occupant behavior modeling
- HVAC zoning strategies
- **Case Study:** Improving thermal comfort in a residential tower

Module 4: Daylight & Solar Simulation

- Daylighting metrics (sDA, UDI)
- Solar radiation mapping
- Glare analysis
- Shading optimization
- Window-to-wall ratio studies
- **Case Study:** Daylight optimization in a university campus building

Module 5: HVAC System Simulation

- System modeling fundamentals
- Chiller and boiler efficiency
- Airflow distribution analysis
- Energy recovery systems
- Control strategies
- **Case Study:** HVAC efficiency improvement in a hospital facility

Module 6: BIM Integration & Digital Twins

- BIM-BPS integration workflow
- Data exchange formats
- Digital twin modeling
- Real-time performance monitoring
- Interoperability tools
- **Case Study:** BIM-based simulation of a smart office building

Module 7: Net Zero & Carbon Analysis

- Operational vs embodied carbon
- Life Cycle Assessment (LCA)

- Net Zero Energy strategies
- Renewable energy integration
- Carbon reporting tools
- **Case Study:** Designing a Net Zero educational building

Module 8: Advanced Parametric & AI Simulation

- Grasshopper & Rhino workflows
- Parametric optimization
- Machine learning in energy prediction
- Multi-objective optimization
- AI-assisted design decisions
- **Case Study:** AI-optimized high-rise façade design for energy reduction

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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Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com