Simulation Modeling for SCM Training Course

Professional Development Training Course Outline

Category	Logistics and Supply Chain Management	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Simulation Modeling for Supply Chain Management (SCM) Training Course is designed to equip professionals with advanced skills in modeling, analyzing, and optimizing complex supply chain systems using cutting-edge simulation techniques. As businesses face increasing global competition, supply chain efficiency and agility are critical for operational success. This course emphasizes practical, data-driven approaches to simulate real-world scenarios, identify bottlenecks, and forecast outcomes, enabling organizations to make informed strategic decisions. Participants will explore a variety of modeling techniques, including discrete-event simulation, Monte Carlo methods, and agent-based modeling, while applying these tools to enhance productivity, reduce operational costs, and improve service levels.

The course leverages hands-on exercises, interactive case studies, and industry-relevant software tools to provide participants with actionable insights into supply chain design and performance improvement. Emphasis is placed on integrating simulation modeling with decision-making processes in procurement, logistics, production planning, inventory management, and demand forecasting. By the end of this course, participants will be able to implement effective simulation models that support risk mitigation, scenario planning, and continuous improvement in supply chain operations. This program is ideal for supply chain managers, operations analysts, industrial engineers, and decision-makers seeking to harness the power of simulation modeling for organizational growth.

Programme Curriculum

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Course Objectives

1. Understand the fundamentals of simulation modeling in supply chain management.
2. Apply discrete-event and agent-based simulation techniques to supply chain processes.
3. Analyze supply chain performance using advanced simulation software tools.
4. Identify bottlenecks and inefficiencies in logistics, inventory, and production systems.
5. Develop predictive models for demand forecasting and capacity planning.
6. Integrate Monte Carlo simulations to assess risk and uncertainty in supply chains.
7. Design and optimize warehouse and distribution networks using simulation.
8. Implement scenario planning for procurement and supplier management decisions.
9. Evaluate the impact of variability and uncertainty on supply chain performance.
10. Use simulation outputs to drive strategic decision-making and process improvement.
11. Apply cost-benefit analysis to simulation-driven supply chain initiatives.
12. Enhance organizational agility through data-driven simulation insights.
13. Develop actionable recommendations for continuous supply chain optimization.

Organizational Benefits

1. Improved supply chain visibility and decision-making accuracy.
2. Reduced operational costs and enhanced resource utilization.
3. Enhanced forecasting and inventory management capabilities.
4. Faster response to market fluctuations and demand variability.
5. Minimized supply chain risks and uncertainty impacts.
6. Optimized logistics, warehousing, and distribution networks.
7. Improved customer service levels and satisfaction.
8. Data-driven insights for strategic planning and scenario analysis.
9. Increased operational efficiency through simulation-based optimization.
10. Enhanced collaboration across supply chain functions.

Target Audiences

1. Supply chain managers and executives
2. Operations and logistics analysts
3. Industrial and production engineers
4. Procurement and sourcing specialists
5. Inventory and warehouse managers
6. Business analysts and data scientists in SCM
7. Consultants in operations management
8. Decision-makers in manufacturing and distribution

Course Duration: 10 days

Course Modules

Module 1: Introduction to Simulation Modeling

- Overview of simulation in supply chain management
- Types of simulation: discrete-event, agent-based, Monte Carlo
- Benefits of simulation modeling for SCM
- Key performance indicators in simulation studies
- Case study: Simulation of a multi-echelon supply chain
- Hands-on exercise with simulation software

Module 2: Data Collection and Input Modeling

- Data requirements for effective simulation
- Techniques for capturing real-world supply chain data
- Input probability distributions and parameter estimation
- Validation and verification of input models
- Case study: Demand data collection for inventory simulation
- Practical data modeling exercises

Module 3: Discrete-Event Simulation Fundamentals

- Concepts of entities, events, and resources
- Process mapping and flowcharts in SCM
- Event scheduling and simulation logic
- Performance metrics and output analysis
- Case study: Production line bottleneck simulation
- Lab exercises on discrete-event simulation

Module 4: Monte Carlo Simulation Applications

- Introduction to Monte Carlo techniques

- Risk and uncertainty analysis in supply chains
- Probability distributions for supply chain variables
- Scenario-based simulations for decision support
- Case study: Supplier lead-time variability analysis
- Hands-on Monte Carlo simulation exercises

Module 5: Agent-Based Simulation in SCM

- Principles of agent-based modeling
- Modeling interactions among supply chain agents
- Behavior rules and adaptive decision-making
- Application in complex logistics and inventory systems
- Case study: Multi-agent simulation of distribution networks
- Software exercises for agent-based modeling

Module 6: Inventory and Warehouse Simulation

- Inventory control policies and simulation techniques
- Warehouse layout and process optimization
- Picking, packing, and storage simulations
- Evaluating throughput and cycle times
- Case study: Warehouse capacity planning simulation
- Lab exercises on inventory and warehouse modeling

Module 7: Production Planning and Scheduling

- Production line simulation and resource allocation
- Job sequencing and throughput analysis
- Bottleneck identification and elimination
- Capacity planning using simulation models
- Case study: Manufacturing plant simulation
- Hands-on scheduling simulation exercises

Module 8: Logistics and Transportation Simulation

- Modeling transportation networks and distribution flows
- Fleet management and routing optimization
- Lead-time variability and delivery performance
- Cost and service trade-offs in transportation
- Case study: Multi-modal logistics simulation
- Lab exercises in logistics modeling

Module 9: Demand Forecasting and Scenario Planning

- Forecasting techniques integrated with simulation
- Scenario development for demand uncertainty
- Sensitivity analysis and decision support
- Supply chain performance under variable demand
- Case study: Forecast-driven production simulation
- Practical exercises in scenario planning

Module 10: Supplier Management Simulation

- Modeling supplier interactions and reliability
- Supplier selection and performance analysis
- Risk assessment and mitigation strategies
- Collaborative supply chain simulations
- Case study: Supplier disruption impact analysis
- Hands-on supplier modeling exercises

Module 11: Cost Analysis and Optimization

- Cost modeling in simulation environments
- Total supply chain cost assessment
- Identifying cost-saving opportunities
- Optimizing trade-offs between cost and service
- Case study: Cost reduction through simulation modeling
- Lab exercises in cost optimization

Module 12: Advanced Analytics and Reporting

- Performance metrics and dashboard design
- Statistical analysis of simulation outputs
- Predictive analytics integration
- Reporting for executive decision-making
- Case study: Simulation-driven KPI analysis
- Practical analytics exercises

Module 13: Risk and Uncertainty Management

- Identifying risks in supply chains
- Simulation for risk mitigation strategies
- Probability and impact modeling

- Scenario analysis for critical decisions
- Case study: Supply chain disruption modeling
- Hands-on risk simulation exercises

Module 14: Continuous Improvement and Lean Simulation

- Lean principles applied to simulation
- Waste identification and process optimization
- Continuous improvement cycles
- Integration with Six Sigma and quality management
- Case study: Lean transformation through simulation
- Lab exercises for process improvement

Module 15: Capstone Simulation Project

- Full supply chain simulation project
- Integration of all modeling techniques learned
- Team-based problem-solving and scenario analysis
- Presenting results to stakeholders
- Case study: End-to-end supply chain optimization
- Project evaluation and feedback

Training Methodology

- Interactive lectures and discussions
- Hands-on exercises using simulation software
- Real-world case studies and problem-solving
- Group projects and collaborative learning
- Scenario-based simulations and workshops
- Continuous feedback and assessment

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	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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