Inventory Modeling and Simulation for Decision Support Training Course

28 Dec 2026 - 01 Jan 2027

Boston

7500 € (Per Person)

Ref: #IM5950_159126

Course Introduction / Overview:

This course provides a comprehensive exploration of advanced inventory modeling and simulation techniques essential for modern supply chain decision-making. In today's volatile market, effective inventory management is the cornerstone of operational efficiency and profitability. This program moves beyond basic concepts to equip participants with the skills to build, run, and interpret sophisticated models that replicate real-world uncertainty. We will delve into both deterministic and stochastic approaches, drawing upon foundational principles established by leading academics like Edward A. Silver in his seminal work, "Inventory Management and Production Planning and Scheduling". Participants will learn how to leverage simulation as a powerful what-if analysis tool to test policies, optimize stock levels, and mitigate risks before implementation. At BIG BEN Training Center, our focus is on practical application, ensuring that you can translate complex analytical outputs into actionable business intelligence. This course is designed to empower professionals to make data-driven decisions that reduce holding costs, prevent stockouts, and enhance overall supply chain resilience, providing a significant competitive advantage in any industry. By mastering these techniques, you will be prepared to tackle complex inventory challenges with confidence and precision.

Target Audience / This training course is suitable for:

- Supply Chain Managers.
- Inventory Planners and Analysts.
- Operations Managers.
- Logistics and Warehouse Supervisors.
- Procurement Specialists.
- Business Analysts with a focus on operations.
- Data Scientists involved in supply chain analytics.
- Demand Planners.
- Consultants in operations and supply chain management.

Target Sectors and Industries:

- Manufacturing and Production.
- Retail and E-commerce.
- Logistics and Third-Party Logistics (3PL) Providers.
- Pharmaceuticals and Healthcare.
- Automotive Industry.
- Fast-Moving Consumer Goods (FMCG).
- Aerospace and Defense.
- Governmental agencies and public sector organizations.
- Technology and Electronics.

Target Organizations Departments:

- Supply Chain Management.
- Operations.
- Logistics and Distribution.
- Inventory Control.
- Procurement and Purchasing.
- Strategic Planning.
- Finance and Cost Accounting.
- Data Analytics and Business Intelligence.

Course Offerings:

By the end of this course, the participants will have able to:

- Develop and apply fundamental deterministic inventory models like the Economic Order Quantity (EOQ).
- Construct and analyze stochastic inventory models to account for demand uncertainty.
- Understand the core principles of discrete-event and Monte Carlo simulation.
- Build practical inventory simulation models using industry-standard concepts.
- Perform what-if scenario analysis to evaluate different inventory policies.
- Optimize safety stock levels and reorder points using simulation data.
- Validate and verify simulation models to ensure accuracy and reliability.
- Interpret simulation outputs to generate actionable insights for management.
- Integrate modeling results into a broader decision support system framework.
- Communicate complex analytical findings effectively to non-technical stakeholders.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, practical, and engaging, ensuring participants can immediately apply their learning. This course blends expert-led instruction with extensive hands-on exercises, moving beyond theory to real-world application. Each day will feature a mix of presentations on core concepts, followed by guided computer-based labs where participants will build and run their own inventory models and simulations. We utilize a case study approach, analyzing inventory challenges from various industries to understand the practical complexities and solutions. Collaborative group work and workshops are integral to the learning process, encouraging participants to share insights and solve problems collectively. Interactive sessions, Q&A panels, and open discussions facilitate a dynamic learning environment where complex topics can be explored in depth. Continuous feedback is provided by the instructor throughout the course, both on an individual and group basis, to reinforce learning and address specific challenges. This immersive, application-focused methodology ensures that participants leave not just with knowledge, but with the confidence and skills to implement advanced inventory strategies within their own organizations.

Course Agenda (Course Units):

Unit One: Foundations of Inventory Management and Modeling

- Introduction to inventory systems and their strategic importance.
- Types of inventory and associated costs (holding, ordering, shortage).
- ABC analysis and other inventory classification techniques.
- Understanding deterministic vs. stochastic inventory environments.
- The classic Economic Order Quantity (EOQ) model.
- Extensions of the EOQ model (e.g., with planned shortages).
- Introduction to the concept of a decision support system.

Unit Two: Probabilistic Models and Safety Stock Management

- Modeling uncertain demand and lead times.
- The Newsvendor Model for single-period inventory decisions.
- Continuous review (Q, r) and periodic review (P, T) policies.
- Calculating reorder points and safety stock levels.
- Understanding service levels (Type 1 and Type 2).
- Forecasting techniques as inputs for inventory models.
- Analyzing the trade-off between inventory cost and customer service.

Unit Three: Fundamentals of Simulation for Inventory Analysis

- Introduction to simulation as a decision-making tool.
- Key concepts of discrete-event simulation.
- Generating random numbers and random variates.
- Building a basic manual inventory simulation.
- Components of a simulation model: entities, attributes, and events.
- Introduction to simulation software concepts and logic.
- Data collection and analysis for simulation inputs.

Unit Four: Advanced Simulation Modeling and Scenario Analysis

- Developing complex inventory simulation models.
- Model verification and validation techniques.
- Statistical analysis of simulation output.
- Designing simulation experiments for policy comparison.
- Conducting what-if and sensitivity analysis.
- Using Monte Carlo simulation for risk assessment in inventory.
- Optimizing inventory policies through simulation.

Unit Five: Strategic Implementation and Decision Support

- Integrating simulation results into business decisions.
- Developing a business case for inventory policy changes.
- Visualizing and presenting simulation findings to stakeholders.
- The role of simulation in supply chain risk management.
- Linking inventory models to broader supply chain performance.
- Capstone project: Building and analyzing a comprehensive inventory simulation case study.
- Future trends in inventory modeling, including AI and machine learning.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

How can simulation models be adapted to accurately reflect the increasing complexity and disruption in global supply chains, such as geopolitical events or sudden pandemics, beyond simple demand and lead time variability?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by focusing intensely on the practical application of modeling and simulation as tools for decision support, rather than as purely academic exercises. While many programs cover the theory, we bridge the critical gap between mathematical models and real-world business strategy. The curriculum is structured to build skills progressively, starting with foundational models and culminating in a comprehensive capstone project where participants tackle a complex, realistic inventory problem from start to finish. This hands-on approach ensures a deep, functional understanding. Furthermore, the course emphasizes the art of interpreting and communicating simulation outputs to non-technical stakeholders, a crucial skill for driving change within an organization. We move beyond just teaching how to build a model to teaching how to use that model to ask the right questions, test critical assumptions, and present a compelling, data-backed case for strategic inventory decisions. The focus is less on a specific software tool and more on the universal logic and analytical mindset required to leverage any simulation platform effectively for tangible business improvement.