Advanced Material Flow Systems in Manufacturing Training Course

Professional Development Training Course Outline

Category	Manufacturing	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Advanced Material Flow Systems in Manufacturing focuses on the design, optimization, and digital control of end-to-end material movement within modern production environments. In today's Industry 4.0 landscape, manufacturers are rapidly adopting smart logistics, lean production systems, automation integration, and AI-driven supply chain optimization to eliminate inefficiencies, reduce lead time, and enhance throughput. Advanced Material Flow Systems in Manufacturing Training Course provides a comprehensive understanding of how materials flow from procurement to production to distribution using advanced planning systems and real-time data intelligence.

This course is designed to bridge the gap between traditional manufacturing operations and next-generation cyber-physical production systems, digital twin simulation, IoT-enabled inventory tracking, and intelligent warehouse management systems (WMS). Participants will gain hands-on knowledge of optimizing material flow using modern methodologies such as value stream mapping, Kanban systems, ERP integration, and predictive analytics for demand forecasting and bottleneck elimination.

Programme Curriculum

Advanced Material Flow Systems in Manufacturing Training Course

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Course Objectives

1. Master advanced material flow optimization techniques in manufacturing systems
2. Understand Lean Manufacturing and Just-in-Time (JIT) production strategies
3. Apply Industry 4.0 smart factory principles for material tracking
4. Analyze and improve value stream mapping (VSM) in production lines
5. Implement AI-driven supply chain forecasting models
6. Optimize warehouse layout and logistics automation systems
7. Integrate ERP and MES systems for real-time material control
8. Reduce production waste using Six Sigma and Kaizen methodologies
9. Enhance operational efficiency through robotic process automation (RPA)
10. Develop skills in digital twin simulation for material flow modeling
11. Improve inventory accuracy using RFID and IoT tracking systems
12. Design scalable smart logistics and distribution networks
13. Build capability in predictive maintenance and flow disruption management

Target Audience

- Manufacturing Engineers
- Supply Chain Managers
- Industrial Engineers
- Operations Managers
- Logistics & Warehouse Supervisors
- Production Planning Specialists
- ERP/MES System Analysts
- Quality Assurance Professionals

Course Modules

Module 1: Fundamentals of Material Flow Systems

- Concepts of material flow in manufacturing
- Push vs pull systems
- Flow efficiency metrics
- Bottleneck identification
- Case Study: Automotive assembly line flow redesign

Module 2: Lean Manufacturing Principles

- Waste elimination techniques

- Value-added vs non-value activities
- Continuous improvement cycles
- Kaizen implementation
- Case Study: Toyota Production System optimization

Module 3: Industry 4.0 in Material Flow

- Smart factory architecture
- Cyber-physical systems
- IoT-enabled production lines
- Digital integration layers
- Case Study: Smart electronics manufacturing plant

Module 4: Value Stream Mapping (VSM)

- Current state mapping
- Future state design
- Lead time reduction methods
- Flow visualization tools
- Case Study: FMCG packaging plant optimization

Module 5: Warehouse Management Systems (WMS)

- Automated storage systems
- Inventory tracking techniques
- Picking optimization
- Space utilization models
- Case Study: Amazon-style fulfillment center

Module 6: ERP & MES Integration

- System architecture overview
- Real-time data synchronization
- Production scheduling integration
- Material requirement planning (MRP)
- Case Study: ERP-driven textile manufacturing unit

Module 7: Smart Logistics Systems

- Autonomous transport systems
- AGVs and AMRs
- Route optimization
- Load balancing strategies
- Case Study: Smart warehouse robotics deployment

Module 8: Supply Chain Analytics

- Predictive demand forecasting
- Big data in logistics
- KPI dashboards
- Risk analysis models
- Case Study: Retail supply chain optimization

Module 9: Inventory Optimization Techniques

- EOQ and JIT models
- Safety stock calculation
- ABC analysis
- Stock replenishment strategies
- Case Study: Pharmaceutical inventory control

Module 10: Automation in Material Handling

- Conveyor systems design
- Robotic arms integration
- Sorting automation
- Automated packaging systems
- Case Study: Beverage bottling plant automation

Module 11: Digital Twin Simulation

- Virtual factory modeling
- Real-time process simulation
- Scenario testing
- Performance forecasting
- Case Study: Aerospace production simulation

Module 12: AI in Material Flow Optimization

- Machine learning in logistics
- Predictive routing systems
- Anomaly detection
- Smart decision systems
- Case Study: AI-powered distribution hub

Module 13: Sustainability in Manufacturing Flow

- Green logistics strategies
- Carbon footprint reduction
- Energy-efficient systems
- Waste recycling integration
- Case Study: Eco-friendly manufacturing facility

Module 14: Risk & Disruption Management

- Supply chain resilience planning
- Crisis response systems
- Backup inventory strategies
- Supplier diversification
- Case Study: COVID-19 supply chain recovery

Module 15: Advanced Optimization Project

- End-to-end system design
- KPI-driven optimization

- Simulation-based validation
- Implementation roadmap
- Case Study: Smart factory transformation project

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	04 Dec 2026	Online	$2,000

Start Date	End Date	Location	Price
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

Ready to enroll or request a customized program? Book online or contact us:

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