Capacity Optimization Modeling in Manufacturing Training Course

Professional Development Training Course Outline

Category	Manufacturing	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In today’s era of Smart Manufacturing, Industry 4.0, and Digital Transformation, organizations must optimize production capacity to remain competitive. Capacity Optimization Modeling leverages Advanced Analytics, AI-driven forecasting, Digital Twins, and Predictive Modeling to align production capabilities with fluctuating demand. Capacity Optimization Modeling in Manufacturing Training Course equips professionals with practical tools to enhance Operational Efficiency, Resource Utilization, Throughput Maximization, and Cost Reduction, while ensuring agility in dynamic manufacturing environments.

Participants will gain hands-on exposure to Data-Driven Decision Making, Lean Manufacturing Principles, Constraint-Based Planning, and Simulation Modeling. By integrating Machine Learning, Real-Time Data Analytics, and Supply Chain Optimization, this program empowers organizations to achieve Scalable Production, Reduced Downtime, and Sustainable Manufacturing Excellence.

Programme Curriculum

Capacity Optimization Modeling in Manufacturing Training Course

Introduction

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Course Duration

5 days

Course Objectives

1. Master Capacity Planning Strategies using AI and Predictive Analytics
2. Apply Lean Six Sigma for Process Optimization
3. Develop Digital Twin Models for manufacturing systems
4. Implement Constraint-Based Scheduling (TOC) techniques
5. Optimize Production Throughput using Advanced Algorithms
6. Leverage Big Data Analytics for Demand Forecasting
7. Enhance Resource Allocation using Optimization Models
8. Reduce Operational Bottlenecks with Simulation Modeling
9. Integrate IoT-enabled Smart Factory Solutions
10. Apply Scenario Planning and What-if Analysis
11. Improve Supply Chain Synchronization and Capacity Balancing
12. Utilize Cloud-Based Manufacturing Analytics Platforms
13. Drive Sustainable and Agile Manufacturing Operations

Target Audience

1. Manufacturing Managers
2. Operations & Plant Heads
3. Industrial Engineers
4. Supply Chain & Logistics Professionals
5. Data Analysts in Manufacturing
6. Continuous Improvement (Lean/Six Sigma) Specialists
7. Production Planners & Schedulers
8. Digital Transformation Leaders

Course Modules

Module 1: Foundations of Capacity Optimization

- Capacity Planning Fundamentals
- Industry 4.0 and Smart Manufacturing
- Key KPIs: OEE, Throughput, Utilization
- Demand vs Capacity Alignment
- Introduction to Optimization Techniques
- **Case Study:** Improving utilization in an automotive assembly plant using OEE metrics.

Module 2: Data-Driven Manufacturing Analytics

- Data Collection & Integration (IoT, ERP, MES)
- Real-Time Analytics Dashboards
- Predictive Maintenance Models

- Data Visualization Tools
- KPI Monitoring Frameworks
- **Case Study:** Reducing downtime using predictive analytics in a smart factory.

Module 3: Advanced Forecasting Techniques

- AI-Based Demand Forecasting
- Time Series & Machine Learning Models
- Scenario Planning
- Demand Variability Management
- Forecast Accuracy Improvement
- **Case Study:** AI-driven demand forecasting in consumer goods manufacturing.

Module 4: Constraint-Based Optimization (TOC)

- Theory of Constraints (TOC)
- Bottleneck Identification
- Drum-Buffer-Rope Methodology
- Throughput Optimization
- Continuous Flow Improvement
- **Case Study:** Eliminating bottlenecks in a steel production line.

Module 5: Simulation & Digital Twin Modeling

- Simulation Tools & Techniques
- Building Digital Twins
- What-if Scenario Analysis
- Process Optimization via Simulation
- Risk Mitigation Strategies
- **Case Study:** Digital twin implementation for production line efficiency.

Module 6: Resource Optimization & Scheduling

- Workforce Planning Optimization
- Machine Scheduling Algorithms
- Multi-Resource Allocation
- Agile Production Scheduling
- Optimization Software Tools
- **Case Study:** Workforce and machine scheduling optimization in electronics manufacturing.

Module 7: Lean & Continuous Improvement Integration

- Lean Manufacturing Principles
- Six Sigma DMAIC Framework
- Waste Reduction Techniques
- Kaizen Implementation
- Value Stream Mapping
- **Case Study:** Lean transformation in a FMCG production facility.

Module 8: Future Trends & Smart Manufacturing

- AI & Machine Learning in Manufacturing

- Autonomous Production Systems
- Cloud & Edge Computing
- Sustainability & Green Manufacturing
- Resilient Supply Chains
- **Case Study:** Smart factory transformation using AI and IoT.

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:

Register Online Now

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