Throughput Optimization 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

Throughput Optimization in Manufacturing is a high-impact, data-driven discipline focused on maximizing production output while minimizing bottlenecks, downtime, and operational waste. In today's competitive Industry 4.0 manufacturing landscape, organizations are increasingly leveraging Lean Manufacturing, Six Sigma, IoT-enabled smart factories, and real-time production analytics to achieve peak efficiency. Throughput Optimization in Manufacturing Training Course equips professionals with advanced techniques to identify constraints, streamline workflows, and enhance overall equipment effectiveness (OEE) across complex production systems.

This program is designed to bridge the gap between traditional manufacturing practices and modern AI-driven predictive manufacturing systems. Participants will learn how to apply Theory of Constraints (TOC), value stream mapping, capacity planning, and digital twin simulation tools to drive measurable throughput improvements. The course emphasizes practical implementation, ensuring learners can transform factory operations into agile, scalable, and high-performance production environments.

Programme Curriculum

Throughput Optimization in Manufacturing Training Course

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Course Duration

5 days

Course Objectives

1. Improve manufacturing throughput efficiency using Lean principles
2. Identify and eliminate production bottlenecks in real-time systems
3. Apply Theory of Constraints (TOC) for workflow optimization
4. Enhance Overall Equipment Effectiveness (OEE) across production lines
5. Implement Lean Six Sigma DMAIC methodology for process improvement
6. Utilize predictive maintenance analytics to reduce downtime
7. Optimize production scheduling and capacity utilization
8. Integrate Industrial IoT (IIoT) data for decision-making
9. Apply value stream mapping (VSM) for waste reduction
10. Improve cycle time efficiency and takt time alignment
11. Use digital twin simulation for throughput forecasting
12. Strengthen continuous improvement (Kaizen) culture
13. Develop data-driven manufacturing performance dashboards

Target Audience

1. Manufacturing Plant Managers
2. Production Supervisors and Engineers
3. Industrial Engineers
4. Operations Managers
5. Lean Six Sigma Practitioners
6. Supply Chain and Logistics Managers
7. Quality Assurance Professionals
8. Automation and Process Improvement Specialists

Course Modules

Module 1: Fundamentals of Throughput Optimization

- Core principles of **manufacturing throughput**
- Introduction to **Lean Manufacturing systems**
- Understanding **bottlenecks and constraints**
- Role of **OEE in production efficiency**
- Key performance indicators (KPIs) in manufacturing
- **Case Study:** Automotive assembly plant improving throughput by identifying hidden bottlenecks in final inspection stations.

Module 2: Theory of Constraints (TOC) in Manufacturing

- Identifying system constraints
- Elevating bottleneck performance
- Drum-buffer-rope scheduling system
- Constraint-focused production planning
- Continuous constraint monitoring
- **Case Study:** FMCG packaging line increasing output by optimizing a single constrained filling machine.

Module 3: Lean Manufacturing & Waste Elimination

- 7 wastes (TIMWOOD) in production
- Kaizen continuous improvement cycles
- Just-In-Time (JIT) production systems
- 5S workplace organization
- Lean flow optimization techniques
- **Case Study:** Electronics manufacturer reducing lead time by 35% through 5S and waste elimination.

Module 4: Six Sigma for Throughput Enhancement

- DMAIC methodology application
- Root cause analysis tools
- Process variation reduction
- Statistical process control (SPC)
- Quality-driven throughput improvement
- **Case Study:** Pharmaceutical plant reducing batch rejection rate using Six Sigma control charts.

Module 5: Production Scheduling & Capacity Planning

- Finite vs infinite capacity planning
- Advanced production scheduling models
- Load balancing across workstations
- Demand-driven planning systems
- Real-time scheduling optimization
- **Case Study:** Textile factory improving delivery performance by optimizing machine scheduling.

Module 6: Industrial IoT & Smart Manufacturing

- Sensor-driven production monitoring
- Real-time machine data analytics
- Predictive maintenance systems
- Cloud-based manufacturing dashboards
- Smart factory integration strategies
- **Case Study:** Steel manufacturing plant reducing downtime using IoT-based predictive alerts.

Module 7: Value Stream Mapping & Process Optimization

- Mapping current state workflows
- Identifying non-value-added activities
- Designing future state processes
- Cycle time reduction techniques
- Cross-functional process alignment
- **Case Study:** Food processing company streamlining packaging flow and reducing waste by 28%.

Module 8: Digital Twin & Advanced Simulation

- Digital twin modeling for factories
- Scenario-based throughput simulation
- Virtual process optimization
- Risk-free production testing
- AI-driven performance forecasting
- **Case Study:** Aerospace manufacturer simulating assembly line changes before physical implementation.

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