

Course No. 1637

# Manufacturing Process Optimization Training Course

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**MANUFACTURING & PRODUCTION ENGINEERING  
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS**

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DURATION

**5 Days**

DELIVERY

**Classroom**



## Course Overview

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The Manufacturing Process Optimization Training Course is a professional development program designed to strengthen the technical, analytical, and managerial capabilities required to evaluate, improve, and sustain manufacturing processes. The course focuses on how organizations can systematically examine process performance, identify inefficiencies, reduce operational losses, and improve the utilization of equipment, materials, labor, time, and production capacity.

Manufacturing process optimization is essential for organizations seeking to improve productivity while maintaining quality, safety, reliability, and cost control. Inefficient process flows, excessive waiting time, bottlenecks, unnecessary movement, long setup periods, equipment constraints, rework, and inconsistent operating practices can significantly affect manufacturing performance. This course provides participants with practical methodologies for identifying these issues and developing structured improvement solutions.

The Manufacturing Process Optimization Training Course covers process mapping, value stream analysis, production flow, bottleneck identification, cycle time analysis, capacity utilization, line balancing, setup and changeover improvement, waste reduction, process stability, quality improvement, performance measurement, and continuous improvement. Participants will learn how to connect process-level improvements with broader operational objectives and how to prioritize improvement initiatives according to operational impact, feasibility, and business requirements.

The program is suitable for manufacturing organizations, oil and gas companies, petrochemical operations, energy and utilities organizations, engineering and industrial services, and large corporations. It can also support government and public-sector organizations managing operational or production-related processes. The course emphasizes workplace application through practical exercises, process analysis, case studies, and improvement planning, enabling participants to translate optimization concepts into actionable operational improvements.

## Objectives

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- Analyze manufacturing processes to identify inefficiencies, bottlenecks, process variation, and productivity losses during the course.
- Develop structured process maps that clearly represent material, information, and workflow across selected manufacturing operations.

- Evaluate cycle time, process time, waiting time, throughput, capacity utilization, and other operational performance factors.
- Apply process optimization techniques to reduce waste, delays, unnecessary movement, rework, and non-value-adding activities.
- Identify production bottlenecks and assess their impact on throughput, capacity, cost, and delivery performance.
- Design practical improvements to production flow, workstation arrangement, resource allocation, and process sequencing.
- Improve equipment and workforce utilization through workload analysis, line balancing, and capacity optimization.
- Apply techniques for reducing setup and changeover time and improving process availability.
- Evaluate manufacturing performance using appropriate productivity, quality, efficiency, and process performance indicators.
- Strengthen process stability through standardized work, performance monitoring, and structured improvement practices.
- Develop prioritized manufacturing process improvement initiatives based on operational impact, feasibility, and organizational requirements.
- Prepare an implementation plan for optimizing a selected manufacturing process by the end of the course.

## Who Should Attend

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The Manufacturing Process Optimization Training Course is designed for professionals directly involved in manufacturing operations, production engineering, industrial engineering, process improvement, quality, maintenance, and operational excellence. It is particularly relevant for Manufacturing Managers, Production Managers, Operations Managers, Plant Managers, Process Engineers, Manufacturing Engineers, Industrial Engineers, Production Engineers, Continuous Improvement Specialists, Lean Professionals, Quality Engineers, and Production Supervisors.

The course is also suitable for Maintenance Managers, Engineering Managers, Supply Chain and Operations Managers, Production Planners, Process Improvement Leaders, Technical Specialists, and professionals responsible for improving manufacturing performance. Executives, department heads, and decision makers in manufacturing, oil and gas, petrochemicals, energy, engineering, and industrial organizations can benefit from the course by gaining a structured understanding of how process optimization contributes to productivity, cost efficiency, quality, capacity utilization, and

operational excellence.

## Learning Outcomes

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- Map and document manufacturing processes to understand the current state of production operations.
- Identify value-adding and non-value-adding activities within manufacturing workflows.
- Analyze cycle time, lead time, waiting time, throughput, and process capacity.
- Identify bottlenecks and determine their effect on production flow and overall system performance.
- Evaluate equipment, workforce, material, and workstation utilization.
- Apply process optimization techniques to reduce waste, delays, unnecessary movement, and process inefficiencies.
- Develop practical approaches for improving production line balance and workload distribution.
- Analyze setup and changeover activities and identify opportunities for reducing production interruptions.
- Select appropriate performance indicators for monitoring manufacturing process efficiency and effectiveness.
- Apply structured improvement methods to improve process stability, quality, productivity, and resource utilization.
- Prioritize process improvement opportunities according to operational impact, feasibility, risk, and expected value.
- Develop a practical manufacturing process optimization plan with defined actions, responsibilities, performance measures, and follow-up mechanisms.

## Course Outline

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### DAY 01

## Manufacturing Process Analysis and Current-State Assessment

- Fundamentals of manufacturing process optimization and its role in operational excellence.
- Understanding manufacturing process structures, inputs, outputs, resources, and constraints.
- Process mapping and visual representation of manufacturing workflows.

## DAY 01 — CONTINUED

- Analyzing material, information, and work movement across production operations.
- Identifying value-adding and non-value-adding activities.
- Understanding process time, cycle time, lead time, waiting time, and throughput.
- Identifying common sources of manufacturing inefficiency and process losses.
- Assessing current production performance against operational objectives.
- Establishing a structured approach to manufacturing process improvement.

**PRACTICAL APPLICATION OR DISCUSSION**

Develop a current-state process map for a selected manufacturing operation and identify major sources of inefficiency, delay, and waste.

## DAY 02

## Bottleneck Management, Capacity Optimization, and Production Flow

- Understanding production capacity and its relationship with process performance.
- Identifying bottlenecks and constraints within manufacturing systems.
- Analyzing the impact of bottlenecks on throughput, inventory, lead time, and delivery.
- Evaluating equipment capacity and utilization across production stages.
- Workforce allocation and workload analysis.
- Principles of production line balancing and workstation optimization.
- Improving production flow through better sequencing and resource allocation.
- Reducing work-in-process accumulation and production queues.
- Managing variability and constraints affecting production continuity.
- Aligning production capacity with demand and operational requirements.

**PRACTICAL APPLICATION OR DISCUSSION**

Analyze a production line with capacity constraints, identify the primary bottleneck, and develop practical actions to improve throughput and resource utilization.

**DAY 03**

## Lean Process Optimization and Manufacturing Waste Reduction

- Principles of Lean manufacturing and their application to process optimization.
- Identifying the major categories of waste in manufacturing processes.
- Reducing unnecessary transportation, movement, waiting, inventory, overprocessing, defects, and excess production.
- Applying value stream thinking to improve end-to-end production flow.
- Improving workplace organization and visual management.
- Standardized work and its role in process consistency.
- Reducing setup and changeover time to improve process availability.
- Improving material flow and workstation layout.
- Reducing rework, scrap, defects, and quality-related process losses.
- Integrating continuous improvement into daily manufacturing management.

**PRACTICAL APPLICATION OR DISCUSSION**

Conduct a structured waste analysis of a selected manufacturing process and develop improvement opportunities focused on flow, productivity, quality, and resource utilization.

**DAY 04**

## Performance Measurement, Process Stability, and Improvement Techniques

- Developing manufacturing process performance indicators.
- Measuring productivity, efficiency, utilization, throughput, quality, and process reliability.
- Establishing meaningful operational baselines and performance targets.
- Analyzing performance gaps between current and desired process conditions.
- Identifying process variation and factors affecting process stability.
- Applying root cause analysis to recurring manufacturing process problems.
- Using data to support process improvement and operational decision making.
- Developing standard operating practices to sustain process performance.

## DAY 04 — CONTINUED

- Monitoring improvement results and verifying whether changes deliver the intended operational impact.
- Managing risks associated with manufacturing process changes.

**PRACTICAL APPLICATION OR DISCUSSION**

Analyze manufacturing performance data, identify the most significant process gaps, determine contributing causes, and develop measurable improvement actions.

## DAY 05

## Integrated Manufacturing Process Optimization and Implementation

- Evaluating the overall effectiveness of a manufacturing process optimization program.
- Prioritizing improvement initiatives according to impact, feasibility, cost, risk, and implementation requirements.
- Developing integrated improvement plans for production processes.
- Aligning process optimization with productivity, quality, cost, capacity, safety, and delivery objectives.
- Using digital technologies, production data, and operational dashboards to support process optimization.
- Strengthening collaboration between production, engineering, maintenance, quality, supply chain, and management.
- Managing organizational and operational change during process improvement initiatives.
- Establishing governance and accountability for improvement implementation.
- Developing mechanisms for monitoring, reviewing, and sustaining process improvements.
- Linking manufacturing process optimization with continuous improvement and operational excellence.

**FINAL WORKSHOP, ACTION PLAN, OR IMPLEMENTATION EXERCISE**

Develop a comprehensive optimization plan for a selected manufacturing process covering current-state analysis, process mapping, bottleneck identification, capacity utilization, waste reduction opportunities, performance indicators, improvement initiatives, implementation responsibilities, priorities, monitoring mechanisms, and sustainability measures.



## Register or Request More Information

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Course page: <https://quest-training.com/courses/manufacturing-process-optimization-training-course>

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