

Course No. 1634

Manufacturing Processes & Production Systems Training Course

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

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The Manufacturing Processes & Production Systems Training Course is a comprehensive professional program designed to develop practical capabilities in manufacturing operations, production systems, process performance, resource utilization, and industrial productivity. The course provides participants with an integrated understanding of how manufacturing processes, equipment, materials, people, production planning, and quality requirements interact to influence overall operational performance.

Modern manufacturing environments require organizations to balance productivity, quality, cost, flexibility, reliability, and delivery performance. Achieving this balance depends not only on advanced equipment, but also on effective process design, production planning, capacity utilization, material flow, workforce allocation, line balancing, setup management, and performance measurement. This course provides a structured approach for evaluating these elements and identifying opportunities to improve manufacturing performance.

The Manufacturing Processes & Production Systems Training Course covers key manufacturing processes and production system concepts, including machining, forming, casting, welding, assembly, production system design, process flow, capacity planning, production line balancing, material movement, setup and changeover reduction, productivity improvement, and manufacturing performance measurement. The program connects technical manufacturing principles with the operational and managerial practices required to improve production performance.

The course is designed for industrial organizations, oil and gas companies, energy and utilities organizations, petrochemical operations, engineering and manufacturing companies, and large corporations. It is also relevant to government entities involved in industrial and operational activities. The emphasis is on practical analysis and workplace application, enabling participants to make better decisions regarding manufacturing processes, production systems, equipment utilization, resource allocation, productivity, and operational improvement.

Objectives

- Analyze the fundamental principles of manufacturing processes and production systems and their relationship with productivity, quality, cost, and operational performance during the course.
- Develop an integrated understanding of major production system types and their operational

characteristics.

- Evaluate existing manufacturing processes to identify factors affecting productivity, efficiency, quality, and production stability.
- Apply process flow analysis techniques to identify bottlenecks, delays, unnecessary movement, and inefficient activities.
- Analyze production capacity requirements in relation to demand, equipment, workforce, materials, and operational constraints.
- Design practical approaches for improving production flow and reducing waiting time, downtime, setup time, and changeover losses.
- Improve equipment and resource utilization through workload analysis, production planning, and line balancing.
- Evaluate production, quality, efficiency, and productivity indicators to identify priority improvement opportunities.
- Apply continuous improvement principles to manufacturing processes and production systems to reduce operational waste and losses.
- Strengthen coordination between production, engineering, maintenance, quality, and supply chain functions to support manufacturing performance.
- Implement practical approaches for improving process stability, standardizing operating practices, and monitoring production results.
- Develop a workplace-based improvement plan for a selected manufacturing process or production system by the end of the course.

Who Should Attend

The Manufacturing Processes & Production Systems Training Course is designed for managers, engineers, supervisors, and specialists responsible for manufacturing, production, engineering, quality, maintenance, and industrial operations. It is particularly suitable for Production Managers, Manufacturing Managers, Operations Managers, Plant Managers, Manufacturing Engineers, Industrial Engineers, Process Engineers, Production Engineers, Quality Engineers, Production Supervisors, Production Planners, and Continuous Improvement Specialists.

The course is also relevant to Maintenance Managers, Engineering Managers, Supply Chain Managers, Materials and Warehouse Specialists, Industrial Project Leaders, Production Team Leaders, and professionals involved in process development and productivity improvement. Executives, department heads, and decision makers in manufacturing, oil and gas, energy,

petrochemicals, engineering, and industrial organizations can also benefit from a stronger understanding of production systems and their contribution to operational excellence and industrial performance.

Learning Outcomes

- Explain the fundamental principles of manufacturing processes and major production system types.
- Differentiate between production systems and determine appropriate applications based on product characteristics, demand volume, and operational requirements.
- Analyze manufacturing process steps and identify factors affecting quality, productivity, cost, and efficiency.
- Evaluate the flow of materials and information throughout production systems and identify bottlenecks and delays.
- Analyze production capacity and relate available capacity to demand, equipment, workforce, and material requirements.
- Apply production line balancing techniques to improve workload distribution across process stages.
- Identify causes of downtime, productivity losses, setup delays, and changeover inefficiencies.
- Evaluate key performance indicators for production, manufacturing efficiency, quality, and productivity.
- Apply continuous improvement principles to manufacturing operations and production systems.
- Develop practical solutions for improving the utilization of equipment, labor, materials, and production resources.
- Strengthen coordination between production, engineering, maintenance, quality, and supply chain functions.
- Prepare a practical improvement plan for a selected manufacturing process or production system.

Course Outline

DAY 01

Manufacturing Fundamentals and Production System Design

- Understanding manufacturing and its role within the organizational value chain.
- Key elements of a production system and the relationship between inputs, processes, outputs, and performance.
- Classification of production systems and their operational characteristics.
- Continuous production, mass production, batch production, job production, and make-to-order environments.
- Selecting production systems according to demand volume, product variety, customer requirements, and operational complexity.
- Principles of manufacturing process design and process sequencing.
- Understanding the relationship between product design, manufacturing processes, equipment, labor, and resources.
- Factors influencing manufacturing cost, productivity, quality, and production stability.
- Understanding material and information flow within manufacturing environments.

PRACTICAL APPLICATION OR DISCUSSION

Analyze a selected production system, identify its main components and characteristics, and evaluate the factors influencing its performance.

DAY 02

Manufacturing Processes and Production Flow

- Overview of machining, forming, casting, welding, assembly, and related manufacturing processes.
- Fundamentals of machining processes and considerations for process selection.
- Turning, milling, drilling, grinding, and their industrial applications.
- Forming, casting, welding, and assembly processes and their quality considerations.
- Relationship between process parameters, product quality, equipment performance, and production efficiency.
- Manufacturing process sequencing and workflow design.

DAY 02 — CONTINUED

- Planning material flow between production stages and work centers.
- Identifying bottlenecks, congestion, unnecessary movement, and material handling losses.
- Improving production flow and reducing waiting, transportation, and handling time.

PRACTICAL APPLICATION OR DISCUSSION

Map and analyze a selected manufacturing process and identify bottlenecks, unnecessary activities, and opportunities for improving production flow.

DAY 03

Production Planning, Capacity Management, and Line Balancing

- Principles of production planning and alignment with demand and available resources.
- Determining production capacity requirements for equipment and workforce.
- Analyzing available, effective, utilized, and actual production capacity.
- Identifying gaps between demand requirements and production capacity.
- Equipment workload planning and resource utilization.
- Principles of production line balancing and task allocation.
- Determining process times, takt time, cycle time, and production requirements.
- Analyzing bottlenecks and their impact on capacity, productivity, and delivery performance.
- Planning workforce, equipment, materials, and production resources.

PRACTICAL APPLICATION OR DISCUSSION

Develop a simplified capacity analysis and production line balancing exercise to identify opportunities for improving workload and resource distribution.

DAY 04

Productivity, Quality, and Manufacturing Loss Reduction

- Identifying waste and major sources of loss within manufacturing operations.
- Analyzing downtime, setup time, changeover losses, and their impact on production performance.

DAY 04 — CONTINUED

- Reducing setup and changeover time to improve equipment and production availability.
- Reducing defects, rework, scrap, and quality-related production losses.
- Analyzing causes of low productivity and unstable manufacturing processes.
- Applying continuous improvement principles to manufacturing operations.
- Using production performance indicators to monitor productivity and operational efficiency.
- Measuring productivity, cycle time, defect rates, equipment utilization, and capacity utilization.
- Improving the use of equipment, labor, materials, and other production resources.
- Strengthening coordination between production, maintenance, engineering, and quality teams.

PRACTICAL APPLICATION OR DISCUSSION

Analyze a manufacturing case involving reduced productivity, identify major sources of loss, and develop measurable improvement actions.

DAY 05

Production System Development and Operational Excellence

- Evaluating overall production system performance and identifying improvement opportunities.
- Developing standard operating procedures to support process consistency and production stability.
- Integrating production with maintenance, engineering, quality, and supply chain activities.
- Using production data to support planning, performance management, and operational decision making.
- Developing balanced performance indicators for productivity, quality, efficiency, capacity, and delivery.
- Identifying opportunities for digitalization, automation, and technology-enabled manufacturing improvement.
- Managing organizational and operational change when implementing new production methods or technologies.
- Building a continuous improvement culture within manufacturing environments.
- Prioritizing production improvement projects according to impact, feasibility, cost, and operational risk.

DAY 05 — CONTINUED

- Linking production system development with operational excellence, sustainability, and industrial competitiveness.

FINAL WORKSHOP, ACTION PLAN, OR IMPLEMENTATION EXERCISE

Develop a comprehensive improvement plan for a selected manufacturing process or production system, covering the current-state assessment, process flow, production capacity, resource utilization, major losses, performance indicators, improvement initiatives, implementation responsibilities, priorities, monitoring mechanisms, and sustainability measures.

Register or Request More Information

Course page: <https://quest-training.com/courses/manufacturing-processes-production-systems-training-course>

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