



## **Principles of Operations Management: Concepts and Applications – Topic Outline**

### **Principles of managing Operations (PMO)**

#### **Session 1: Operations Management Foundations**

- Define the science and practice of operations management (OM)
- Answer the question why OM should be studied
- Describe how today's business trends are driving operations management
- Discuss the role of operations management in the organization
- Define the value-added activities performed by OM
- Describe how OM fits into the organization
- Describe the functions performed by OM
- Describe how OM has changed over the decades
- Outline the role of OM and business strategy
- Identify how OM contributes to business strategy
- Discuss how businesses can compete with OM
- Detail the ten strategic decisions of OM
- Identify career opportunities in the field of OM
- Perform a managing operations knowledge self-assessment

#### **Session 2: Operations and Processes**

- Define organization, operations, and processes
- Define a process
- Detail the flow of a process
- Understand the difference between products and services
- Define an operation
- Determine the difference between processes and operations
- Discuss the relationship of processes and the customer
- Review the place of different types of customers in the supply chain
- Identify customer wants and needs
- Match customer wants and needs with process solutions
- Detail the scope of process management
- Understand the organization as a network of functional processes

- Map the process-driven organization
- Explain team-based process networking
- Describe the strategic impact of processes and operations
- Outline and work with the four Vs of processes

### **Advanced Topics**

- Evolution of process and operations management
- The three levels of processes and operations

## **Session 3: Project Management**

- Define project management
- List the components of a project
- Describe the four objectives of a project
- Detail project goals dynamics
- Contrast managing ongoing operations and project management
- Outline the project management system
- Define the phases of the project management life cycle
- Review the project positioning phase
- Review the initiation and planning phase
- Review project human resource management, roles, and responsibilities
- Construct a project schedule
- Review the execution and control phase
- Review the completion phase
- Understand the Gantt chart
- Plan projects with CPM and PERT
- Work with CPM and PERT scheduling examples

### **Advanced Topics**

- Contrast ongoing operations and projects
- Review EVM Gantt chart and spreadsheet
- Manage project risk
- Perform an AON critical path method (CPM) network schedule exercise

## **Session 4: Product Design and Development**

- Describe the life cycle of products
- Detail the drivers of new product development
- Understand the principles of product development
- Describe the product design organizational structure
- Review the changing paradigms in product design development
- Explore the steps linking product design and processes
- Work with the product design process flow
- Perform a break-even analysis
- Perform a make or buy analysis
- Define quality functional deployment (QFD)
- Explore the House of Quality

Explore the four Houses of Quality  
Detail product design techniques  
Review service design and development

### **Advance Topics**

Build a new product base-case financial model  
Explore the Taguchi loss function

## **Session 5: Process Design Strategies**

Define process design  
Detail the factors influencing process design  
Describe the different process choices  
Outline transformation process types  
Perform process design – core design structure  
Determine the cost equalization point (CEP)  
Interpret the cost equalization point (CEP) graphic  
Define process layout design  
Detail the factors driving process layout design  
List the various process layout options  
Position process choices with layout choices  
Describe hybrid process layouts  
Investigate production cells  
Maximize process layout efficiency

### **Advanced Topics**

Little's Law and process design  
Types of processing equipment  
Impact of automation on processes  
Processing equipment systems  
Production technology systems

## **Session 6: Mid-Term Exam**

## **Session 7: Total Quality Management**

Define quality  
Discuss why quality has become so important  
Detail the dimension of quality  
Review the elements of the cost of quality  
Discuss the hidden costs of poor quality  
Interpret the cost of quality graphs  
Define total quality management (TQM)  
Review the quality management thought leaders  
Outline TQM and strategy  
Determine the TQM program  
Define quality control  
Define continuous improvement

- Define process management
- Describe the elements of design for quality
- Review the elements of employee involvement in quality management
- Position lean process management and TQM
- Outline the components of the TQM tool kit

### **Advanced Topics**

- Quality thought leaders – key statements
- Measuring quality costs
- Measuring product yield and cost
- Quality productivity ratio (QPR)

### **Session 8: Statistical Quality Control**

- Define statistical quality control (SQC)
- Review the statistical quality control system
- Detail the three stages of statistical quality control
- Understand the different types of quality problems
- Explore the range of quality problems
- Understand process variance
- Describe the patterns of variability
- Review process capability ratio and index calculations
- Define statistical process control (SPC)
- Define inspection
- Review the basics of inspection
- Review sampling techniques
- Develop a sample plan
- Understand how to work with  $\bar{x}$ -bar and  $p$ -control charts
- Define six sigma quality management

### **Advanced Topics**

- Probability of process error
- Constructing an  $R$ -chart
- Constructing a  $c$ -chart

### **Session 9: Process Improvement and Performance**

- Define process improvement
- Process improvement paths
- Process improvement dynamics
- Elements of process improvement
- Process improvement methodologies
- Six sigma quality
- Tools for six sigma quality improvement
- Flow charts
- Check sheets
- Histograms

- Cause-and-effect diagrams
- Pareto diagrams
- Scatter diagrams
- Control charts
- Benchmarking
- Balanced scorecard
- Lean kaizen and process improvement
- Sustainability and process improvement

### **Advanced Topics**

- Design of experiments
- A3 problem solving
- Hoshin management
- Obstacles to process improvement

## **Session 10: Organizational Management and Performance**

- Define the objectives of organizational design
- Detail the principles of organizational design
- List the values of organizational design
- Design capable organizations
- Guide the organization through change
- Review change management strategies
- Detail the eight steps of change management
- Understand the role of change leadership and management
- Understand risk terms and concepts
- Manage organizational resiliency
- Detail the tools for managing risk
- Outline workplace management goals
- Review the job characteristics model
- Improve job potential and motivation
- Work with work measurements and standards
- Perform a time study calculation
- Perform a work sampling calculation

### **Advanced Topics**

- Identifying organizational competencies
- Competitive power of an organization
- FMEA exercise
- Finding a time study sample size
- Deriving a time standard from work sampling

## **Session 11: Final Exam**