

Applied Operations Management: *Manufacturing and Services*

Course Description

This course teaches you how to manage operations and productive systems. Operations management involves the planning, coordinating, and executing of all activities that create goods or services. You will gain a working knowledge of methods for designing operational functions, systems and processes; will learn to apply strategic and operational decisions in improving processes for delivering goods and services to customers; and will learn to apply tools to achieve competitive in both manufacturing and services businesses. The course outlines new trends in the subject, such as total quality management (TQM), business process reengineering (BPR), supply chain management (SCM), and agile technology and modularity.

Completion Deadline & Exam: This course, including the examination, must be completed within one year of the date of purchase. In addition, unless otherwise indicated, no correct or incorrect feedback for any exam question will be provided.

Course Level: Overview. This program is appropriate for professionals at all organizational levels.

CPE Credits: 14 (CPA)

Category: Management

Prerequisite: Basic Accounting

Advanced Preparation: None

Course Learning Objectives

Chapter 1: What Is Production /Operations Management?

After studying this chapter you will be able to:

1. Define operations.
2. Define the term production and operations management
3. Compare service and manufacturing.
4. Discuss what operation strategies consist of.
5. Outline a production system.
6. Formulate a guideline to increase productivity.
7. Implement a process for quality control.
8. Construct a quality circle.
9. Discuss the concept of continuous improvement (CI).
10. Improve quality costs.

11. Explain the ISO-9000 Series Standards.
12. Diagram a fishbone diagram.
13. Explain and initiate The 5W2H approach.
14. Describe the Deming Prize.
15. Explain the Taguchi quality loss function.
16. Establish benchmarking.
17. Distinguish between Total Quality Management (TQM) and Business Process Reengineering (BPR).

Chapter 2: Tools for Decision Making

After studying this chapter you will be able to:

1. Outline the steps in the decision making process.
2. Discuss a decision making under uncertainty.
3. Construct a decision matrix and a payoff table and use it to solve a problem.
4. Diagram a decision tree.
5. Explain and give examples of optimization models.
6. Describe the uses of statistical models.
7. Develop and implement a simulation model.
8. Develop and solve a linear programming (LP) model.

Chapter 3: Demand Management and Forecasting

After studying this chapter you will be able to:

1. Explain how the Delphi method works.
2. Compute a moving average.
3. Differentiate between a weighted moving average and exponential smoothing.
4. Explain and illustrate trend analysis.
5. Perform a simple regression.
6. Outline the least-squares method.
7. Interpret a variety of regression statistics such as the correlation coefficient, the standard error of the estimate, and the t-value.
8. Discuss classical decomposition.
9. Compute various measures of forecasting performance such as the mean absolute deviation (MAD) and the mean squared error (MSE).
10. Define and illustrate a tracking signal.

Chapter 4: Process Selection and Capacity Planning

After studying this chapter you will be able to:

1. Discuss the concept of production design.
2. Prescribe a method for process planning.
3. Illustrate a modular design.
4. Describe the process to develop automation.

5. Develop a system of standardization.
6. Explain the role of Flexible Manufacturing System (FMS).
7. Explain Computer-Integrated Manufacturing (CIM).
8. Demonstrate Computer-Aided Design (CAD).
9. Demonstrate Computer-Aided Manufacturing (CAM).
10. Explain how to conduct product analysis.
11. Describe a method of process selection.
12. Define reliability.
13. Compute the failure rate.
14. Calculate the mean time between failures (MTBF).
15. Explain the concept to utilize and maximize the capacity.
16. Evaluate capacity alternatives.

Chapter 5: Facility Location Planning

After studying this chapter you will be able to:

1. Explain a locational break-even analysis.
2. Demonstrate factor ratings.
3. Illustrate the center-of-gravity method.
4. Outline and discuss the transportation LP problem.
5. Explain how the northwest corner rule works.
6. Describe Vogel's approximation method (VAM).
7. Illustrate the MODI (modified distribution) method.
8. Demonstrate the stepping-stone method.

Chapter 6: Design of Work Systems

After studying this chapter you will be able to:

1. Detail a job design.
2. Develop an operation chart.
3. Illustrate a flow process chart.
4. Design a multiple-activity chart.
5. Discuss a motion study and a time study.
6. Outline the procedure to develop time standards.
7. Explain MTM (methods-time measurement).
8. Conduct a process for work sampling.
9. Explain the learning curve effect.

Chapter 7: Facilities Positioning

After studying this chapter you will be able to:

1. Develop a layout plan.
2. Outline a method for material handling.

3. Demonstrate a process layout.
4. Describe a product layout.
5. Illustrate a group layout.
6. Demonstrate and describe a fixed-position layout.
7. Diagram a flow process chart.
8. Discuss and defend group technology processes.
9. Perform line balancing.

Chapter 8: Production Planning Systems

After studying this chapter you will be able to:

1. Develop an aggregate production plan.
2. Distinguish between a level plan and a chase plan.
3. Explain the process to achieve rough-cut capacity planning.
4. Illustrate a trial-end-error method for aggregate planning.
5. Diagram a master production schedule (MPS).
6. Formulate a process for loading.
7. Illustrate an assignment problem.
8. Explain the priority rules.
9. Implement an operations scheduling procedure.
10. Describe briefly Johnson's rule.

Chapter 9: Independent Demand Inventory Systems

After studying this chapter you will be able to:

1. Explain what is meant by an independent demand.
2. Compute the economic order quantity (EOQ).
3. Show how to determine EOQ with a quantity discounts schedule.
4. Determine optimal safety stock.
5. Calculate the optimum reorder point.
6. Discuss the marginal approach to inventory.
7. Demonstrate the Monte Carlo simulation method.
8. Describe the ABC analysis method to control inventory control.

Chapter 10: Material Requirement Planning and Just-In-Time Systems

After studying this chapter you will be able to:

1. Define a dependent demand.
2. Initiate a Material Requirements Planning (MRP) process.
3. Prepare a bill of materials (BOM).
4. Design a product structure file.
5. Develop an Inventory-status file.
6. Develop a planned order release.

7. Schedule receipts.
8. Demonstrate lot-for-lot ordering procedure.
9. Differentiate between the gross requirements and the net requirements.
10. Develop a manufacturing resource planning (MRP II) procedure.
11. Demonstrate Just-in-time (JIT) planning system.
12. Outline manufacturing information systems.

Chapter 11: Planning and Controlling Projects

After studying this chapter you will be able to:

1. Define a Gantt chart.
2. Define dummy activity.
3. Compute the Critical Path.
4. Compute the earliest start time, the earliest finish time, the latest start time, and the latest finish time.
5. Illustrate a Backward pass.
6. Define and explain the PERT/COST.
7. Demonstrate the Critical Path Method (CPM).
8. Discuss the concept of crashing.

Chapter 12: Analysis of Waiting Lines and Queuing

After studying this chapter you will be able to:

1. Discuss the goal of the queuing (or waiting line) theory.
2. List some examples of waiting for service.
3. Classify the queue process.
4. Distinguish among various queuing models.
5. Calculate the measures of system performance for each model that are used in queuing, such as the mean number in system, mean time in system, and mean time waiting for service.
6. Distinguish between finite and infinite population sources.

Chapter 13: Quality Control and Continuous Improvement

After studying this chapter you will be able to:

1. Conduct a Pareto analysis.
2. Initiate a statistical control analysis.
3. Develop a control chart.
4. Compute the means and the range.
5. Distinguish between the producer's risk and the consumer's risk.
6. Explain the Operating Characteristic (OC) curve.
7. Develop a sampling plan.
8. Discuss the acceptance sampling technique.
9. Calculate the average outgoing quality (AOQ).
10. Compute the average outgoing quality limit (AOQL).

11. Determine the acceptable quality level (AQL).
12. Explain and discuss the lot tolerance percent defective (LTPD).