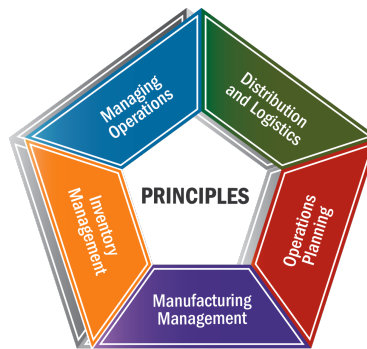


Avvertenza: ogni corso é da intendersi frequentabile singolarmente e potete, quindi, scegliere il più adatto ai vostri obiettivi; inoltre, potete anche creare insieme a noi un “corso su misura” strutturato con argomenti selezionati da due o più corsi.

Remark: every course is a single module and you can choose the one fitting your aims; more, you can also create with us a “customized course” with topics picked up from two or more single module.



Principles of Operations Management Concepts and Applications – Topic Outline

I. Principles of Inventory Management (PIM)

Session 1: Operation 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 an inventory management knowledge self-assessment

Session 2: Fundamentals of Inventory Management

- Define inventory management
- Define inventory management objectives
- Describe the different classes of inventory
- Identify the different levels of inventory management
- Review the characteristics of inventory in the supply chain
- Detail the strategic inventory management process
- Describe the elements of an effective inventory management strategy
- Balance demand and supply objectives
- Contrast the conflicting objectives of inventory management among marketing/sales, finance, and operations
- Understand inventory trade-off decisions
- Describe inventory and demand flows
- Define supply chain inventory and demand flows
- Describe inventory dynamics
- Understand how inventory provides value
- Determine whether inventory is an asset or a liability
- Assess the impact of cash flow and inventory management

Session 2: Advanced Topics

- Trade-off decisions by item class
- Subclasses of inventory
- Item numbering

Session 3: Purpose and Function of Inventory

- Explain why companies carry inventory
- Define the five functions of inventory and describe their use
- Describe the purpose of decoupling inventories
- Detail the components of inventory decision making
- Use a simple formula to estimate inventory throughput and cycle and pipeline inventories
- Define the elements of inventory cost
- Understand and calculate inventory carrying costs
- Define the elements of manufacturing and purchasing costing
- Calculate the impact of stockout costs on the operation
- Discuss how excess and obsolete inventories affect inventory management
- Work with the five basic methods of inventory valuation.

Session 3: Advanced Topics

- Measuring inventory throughput
- Cost of preventing a stockout
- Capacity associated costs
- Estimating inventory values
- Calculating order costs
- Inventory valuation methods

Session 4: Inventory Replenishment Management

- Explain the basic functions of statistical inventory management
- Understand the difference between independent and dependent demand
- Define the theory of inventory replenishment management
- Describe the difference between continuous and periodic inventory review
- Describe the inventory replenishment planning process
- Define the seven inventory replenishment methods
- Work with the order point inventory ordering method
- Calculate safety stock
- Calculate the order point
- Calculate a periodic inventory order method
- Calculate the inventory order quantity
- Calculate the economic order quantity (EOQ)
- Review the inventory planning process

Session 4: Advanced Topics

- Normal distribution diagram
- Characteristics of order point management
- Periodic review exercise
- EOQ exercise

Session 5: Additional Inventory Replenishment Techniques and Inventory Performance

- Work with several advanced inventory management techniques
- Counter uncertainty in supplier delivery times
- Understand and perform planning using *time-phased order point* (TPOP)
- Define order quantities by item class
- Work with financial statements and inventory
- Calculate relevant inventory turnover ratios
- Define inventory performance management tools
- Understand and work with ABC inventory control

Establish inventory accuracy tools
Understand and establish a cycle counting program
Identify today's electronic inventory data collection technologies

Session 5: Advanced Topics

Production noninstantaneous receipt
Products orders and delivered jointly
Quantity discount

Session 6: Mid-Term Exam

Session 7: Lean Inventory - Concept and Practice

Define the concepts of just-in-time (JIT)/lean and how they apply to the management of inventories
Describe the evolution of the JIT/lean philosophy and techniques
Define the core principles of JIT/lean
Describe in detail the three major sources of operations waste
Describe the lean toolkit of techniques to combat waste
Differentiate value-added work from waste
Manage inventory effectively in a JIT/lean environment
Determine JIT/lean lot-sizes
Establish a pull system
Calculate the number and work with kanbans/containers
Describe the benefits of JIT/lean on all levels of the organization

Session 7: Advanced Topics

JIT/lean evolution
Ten cultural and managerial elements of JIT/lean
Impact of lot size reduction
Lean transformation roadmap

Session 8: Fundamentals of Purchasing

Define the purchasing function
Identify purchasing as a key business function
Describe the categories of purchasing
Detail the strategic responsibilities of purchasing
Describe purchasing's detailed responsibilities
Understand the structure of the purchasing organization

Describe purchasing's role with other business functions

Understand the difference between centralized and decentralized purchasing

Describe the buyer/planner concept

Manage the make or buy decision

Create an effective purchasing strategy

Session 8: Advanced Topics

Purchasing Classification Exercise

Financial Impact of Purchasing

Session 9: Sourcing Strategies

Define the sourcing process

Understand the difference between tactical and strategic buying

Detail the steps in making the make or buy decision

Develop a cost avoidance analysis

Conduct an effective spend analysis

Distinguish between different types of supplier relationship

Execute a sole or a multiple supplier sourcing strategy

Effectively score capabilities and select the optimal supplier

Work with different supplier pricing alternatives

Engage in effective negotiations with a supplier

Understand the elements of supplier contract formulation

Construct a collaborative program that engages the supplier in product design

Define supplier relationship management (SRM)

Session 9: Advanced Topics

Cost avoidance analysis

Spend analysis documents

Pareto chart of percentage by category

Supplier selection comparison

Purchase quantity discount

Supplier relationship characteristics

Session 10: PO Management and Performance Measurement

Define the purchasing management process

Manage the procurement database

Detail the various purchase order methods

Trace the purchase order flow from requirements identification to purchase order close-out

Determine the timing of purchase order release
Using material requirements planning (MRP), reorder point (ROP), and kanban systems for order release
Establish a vendor managed inventory (VMI) process
Determine inbound transportation factors
Perform receiving and order closeout
Review purchase order status reporting
Review supplier and internal purchase organization performance
Work with international sourcing
Explore the impact of the Internet and computerized technologies on procurement

Session 10: Advanced Topics

Supplier rating
Cost of poor quality
e-SRM services
e-SRM processing

Session 11: Final Exam

II. Principles of Operations Planning (POP)

Session 1: Operation Management Foundations

- Describe how today's business trends are driving operations management
- Define the science of operations management
- Identify the decisions made by operations managers
- Explain how operations management is important to both manufacturing and service functions
- Discuss the role of operations management in the organization
- Describe operations management's role in supply chain management
- Provide examples of how operations management is a competitive weapon
- Identify career opportunities in the field of operations management
- Perform an operations planning self-assessment review

Session 2: Planning Foundations

- Understand the basics of business planning
- Describe the dynamics of business planning
- Understand the different levels of planning that occurs with a business
- Understand the planning and control process model
- Describe the features of a business plan
- Understand how the different levels of business planning work with each other
- Work with a business planning process model
- Develop a business mission/vision
- Perform investment planning
- Perform profit planning
- Perform asset and capital planning
- Develop business unit strategies
- Describe the components of a planning architecture model

Session 2: Advanced Topics

- Generic competitive values
- Enterprise investment plan
- Profit planning
- Asset/capital planning

Session 3: Forecasting

- Define the forecasting function
- Review of the three levels of forecasting

Define demand
Explore the universal principles of forecast management
Understand forecast design and parameter issues
Detail the forecasting process
Detail the benefits of forecast accuracy
Describe the general forecasting techniques and data sources
Review qualitative, quantitative, and causal forecasting techniques
Discuss why forecasts fail

Session 3: Advanced Topics

Selection of forecasting models
Pyramid forecasting
Deseasonalized forecast
Forecast trend with exponential smoothing (Holt's model)
Forecast trend extrapolation

Session 4: Demand Management

Define demand management
Review the components of demand management
Place demand management in the MPC system
Evaluate forecast performance
Use the measures of forecast error
Calculate forecast error
Determine the MAD and standard deviation of forecast error
Calculate forecast bias and tracking errors
Define customer relationship management
Work with customer order management
Define customer service management
Explore demand management technology tools
Define demand management performance

Session 4: Advanced Topics

Tracking signal
Forecast error exercise
Safety stock calculation
Customer service gap analysis

Session 5: Sales and Operations Planning (S&OP)

Define sales and operations planning (S&OP)
S&OP in the MPC system

S&OP detailed planning process
Determine product families
S&OP planning inputs
S&OP historical input data
Summary of S&OP outputs
Understand the S&OP grid
Work with the make-to-stock (MTS) S&OP grid
Work with the make-to-order (MTO) S&OP grid
Implement the monthly S&OP planning meeting
Define the benefits of S&OP

Session 5: Advanced Topics

Executing a S&OP level strategy
S&OP production resource planning

Session 6: Mid-Term Exam

Session 7: Aggregate Operations Planning

Review the detailed S&OP process
Understand the sales and marketing planning processes
Work with product life cycles and delivery network structures
Calculate a S&OP product family forecast disaggregation
Understand the production planning process
Determine production planning strategies
Calculate the financial impact of the production plan
Define resource requirements planning
Develop capacity and load profiles
Generate a resource requirements plan
Understand the inventory planning process
Calculate a production plan using an inventory target
Develop the distribution plan
Determine transportation, warehouse, and equipment and labor requirements

Session 7: Advanced Topics

Financial decision – workforce costs
Financial decision – inventory costs
Financial decision – total costs

Session 8: Master Scheduling Foundations

Define master scheduling – principles and concepts

- Understand the role of master scheduling in the MPC system
- Detail the objectives of master scheduling
- Understand master scheduling and the manufacturing environment
- Work with master scheduling approaches
- Detail the inputs to master scheduling
- Review the interaction between sales and operations planning (S&OP) and master scheduling
- Establish planning bills of material
- Understand the master schedule grid
- Work with the master schedule grid and demand management
- Calculate the projected available balance (PAB) in the master schedule grid
- Calculate net requirements in the master schedule grid
- Generate MPS orders
- Calculate available-to-promise in the master schedule grid
- Work with MPS time fences and zones

Session 8: Advanced Topics

- Managing the rolling master schedule
- Cumulative “look ahead” ATP

Session 9: Master Scheduling Processes

- Define the role of the master scheduler
- Review the causes of master schedule change
- Work with the master scheduling management process
- Work with the forecast
- Manage order requests
- Understand the use of time fences
- Understand types of master schedule orders
- Work with action messages
- Work with safety stock
- Discuss capacity planning methods
- Define the rough-cut capacity planning process
- Calculate the rough-cut capacity plan
- Detail the performance elements of a successful master schedule.

Session 9: Advanced Topics

- Environmental characteristics
- What is advanced planning and scheduling (APS)?
- Assemble-to-order (ATO) master scheduling

Session 10: Operations Systems

- Explore the importance of information technology
- Detail the role of information technology
- Analyze the technology strategic triangle
- Explore technology organization framework assumptions
- Outline operations planning system assumptions
- Explore how system technology benefits planning
- Define enterprise resources planning
- Trace the evolution of ERP systems
- Analyze the components of today's ERP system
- Compare ERP and "best of breed" software solutions
- Detail the requirements for ERP and system thinking
- Outline the ERP organizational maturity model
- Review ERP and enterprise competitive development
- Detail the benefits of applying ERP systems to the management of the business.

Session 11: Final Exam

III. Principles of Manufacturing Management (PMM)

Session 1: Operations Management Foundations

- Describe how today's business trends are driving operations management
- Define the science of operations management
- Identify the decisions made by operations managers
- Explain how operations management is important to both manufacturing and service functions
- Discuss the role of operations management in the organization
- Describe operations management's role in supply chain management
- Provide examples of how operations management is a competitive weapon
- Identify career opportunities in the field of operations management
- Perform a manufacturing management self-assessment review

Session 2: Introduction to Manufacturing Management

Define manufacturing
Review the components of manufacturing management
Review product manufacturing choices
Understand the impact of volume, variety, and lead time
Explore product manufacturing choice positioning
Detail manufacturing process choices
Explore product and process choice positioning
Review process layout options
Explore process layout positioning
Detail steps for developing a manufacturing strategy
Outline manufacturing structural and infrastructural choices
Understand product profiling
Explore batch versus flow and push versus pull manufacturing techniques
Detail job content and operator tasks

Session 2: Advanced Topics:

- Product profiling
- Production plan issues
- Layout characteristics – exercise
- Performance objectives – exercise
- Process selection – unit costs
- Process selection – least cost

Session 3: Manufacturing Product Structures

Define the product structure
Define the bill of material
Define the process routing
Product structure management process
Bill of material uses
Basic bill of material formats
Achieving bill of material accuracy
Define work centers
Work center utilization and efficiency
Processing time elements
Establishing the process routing
Manufacturing cost overview
Product structure cost development
Standard cost example

Advanced Topics

- Modular bills of material

Engineering change control management
Advanced process routing exercise
Activity based costing

Session 4: Basics of Material Requirements Planning (MRP)

Understand the requirements to plan and make a product
Define the critical inventory question
Define the two basic order methods: stock replenishment and material requirements planning (MRP)
Understand the difference between independent and dependent demand
Detail the problems with stock replenishment techniques
Compare stock replenishment and MRP techniques
Understand the concept of time phasing
Define MRP
Map the flow of MRP
Detail MRP objectives and functions
Work with MRP inputs and outputs
Use bills of material, lead time offsetting, and exploding
Work with the MRP planning grid calculations

Advanced Topics

Advanced time phasing concepts
Dates and time-buckets
Problem of lumpy demand

Session 5: Managing with MRP

Perform the MRP BOM explosion process
Define the role of the MRP planner
Understand the causes of MRP change
Detail the MRP planning process
Define the prerequisites for MRP
Work with the MRP generation
Understand the types of MRP supply orders
Detail MRP system action messages
Perform MRP action message activities
Define MRP performance policies and methods
Identify MRP problem indicators
Develop MRP performance measurements

Advanced Topics

Planning for scrap and waste
Low level coding overview
MRP pegging
MRP and service order management
MRP in the make-to-order environment

Session 6: Mid-Term Exam

Session 7: Capacity Planning and Management

Define capacity management
Detail the elements of capacity management
Understand the relationship between planning and controlling priorities and capacities
Understand the four levels of capacity management
Define capacity requirements planning (CRP)
Understand the flexibility of capacity and scheduling
List the objectives of capacity planning
Detail the inputs into capacity management
Describe the steps to effectively managing the capacity process
Detail of the components of capacity management
Calculate work center capacity
Calculate work center load
Schedule work center operations
Manage the load versus capacity report
Manage excesses and shortages in capacity

Advanced Topics

Calculating efficiency and utilization
Finite and infinite loading
Manufacturing environments and capacity
Process flow scheduling

Session 8: Production Activity Control

Define production activity control (PAC)
Detail the goals of production activity control (PAC)
Detail the characteristics of PAC systems
Understand the linkage between PAC and the planning system
Work with PAC database files
Work with the major activities of the PAC system
Detail the manufacturing order release process
Detail PAC scheduling activities

Explore PAC scheduling priority rules
Detail PAC data collection and monitoring activities
Understand the purpose of PAC control and feedback activities
Detail order disposition and closeout activities

Advanced Topics

PAC control and feedback process steps
Types of manufacturing order
Characteristics of good PAC performance measurement
Relationship of PAC with other functions

Session 9: Advanced Scheduling

Detail the two types of scheduling
Define MRP-push system and lean-pull system scheduling
Define scheduling components
Work with MRP-based scheduling inputs
Manage order schedules
Work with scheduling functions
Understand planner order release and scheduling
Use the dispatch list
Detail the steps in the rescheduling process
Resolve schedule conflicts
Work with order status and work center load reports
Use operation overlapping and lot-splitting techniques
Schedule bottleneck work centers
Manage scheduling with input/output reporting

Advanced Topics

Production planner's planned order display
Capacity check, scheduling, and release
Theory of constraints (TOC) scheduling

Session 10: Lean Production Management

Define lean and just-in-time (JIT) concepts and practices
Trace the evolution of the lean concept
Detail the advantages of implementing lean
Understand the structure of lean manufacturing
Define the concept of process waste
Use lean to standardize manufacturing processes

Explore the elements of “lean thinking”
Define employee involvement and empowerment
Explore the components of lean production concepts and practices
Work with lean plant layout design
Understand the basics of the lean production pull system
Define kanban production techniques
Execute a two-card kanban production flow
Understand the connection between MRP and lead scheduling techniques
Use lean to develop the “customer-focused” organization.

Advanced Topics

- Calculating takt time
- Calculating kanban cards
- MRP push-based versus lean pull based systems

Session 11: Final Exam

IV. Principles of Distribution and Logistics (PDL)

Session 1: Operations Management Foundations

- Describe how today's business trends are driving operations management
- Define the science of operations management
- Identify the decisions made by operations managers
- Explain how operations management is important to both manufacturing and service functions
- Discuss the role of operations management in the organization
- Describe operations management's role in supply chain management
- Provide examples of how operations management is a competitive weapon
- Identify career opportunities in the field of operations management
- Perform a distribution and logistics self-assessment review

Session 2: Introduction to Distribution and Logistics

- Define distribution management
- Demonstrate the components of the supply and distribution channel
- Detail a channel design tree structure
- Describe the various types of channel intermediaries
- Identify the need for distribution channels
- Detail the roles performed by the distribution function
- Define logistics management
- Describe the functions of logistics management
- Explain the components of logistics operations
- Understand the concept and practice of reverse logistics
- Detail the components of an effective logistics strategy
- Explore the guidelines for creating a logistics strategy
- Understand the role of the logistics function in supply chain management

Advanced Topics

- The organization of logistics
- The distribution sorting process
- Value-added role of logistics
- Reverse logistics financial worksheet

Session 3: Channel Network Design

- Define the activities involved in channel network design
- Explain the reasons for supply and distribution channels

Detail critical channel network design considerations
Understand channel network design factors
Outline levels of channel network dependency
Work with the channel configuration attribute matrix
Describe several different channel network design options
Compare distribution network design option performance
Deploy a framework for channel network design
Discuss the micro decisions influencing distribution channel design
Use the factor-rating method for channel network design
Use the center-of-gravity method for channel network design
Detail channel demand and capacity.

Advanced Topics

- Global channel facilities
- Delivery network facilitators
- Location break-even analysis

Session 4: Inventory Management

Define the inventory management function
Identify the functions of inventory
Outline the strategic inventory management process
Understand the characteristics of inventory in the distribution channel
Trace channel inventory and demand flows
Identify the components of inventory replenishment
Describe replenishment ordering techniques
Understand the order point model
Calculate order point safety stock
Determine the replenishment order quantity
Identify the components of inventory carrying cost
Calculate the EOQ
Work with minimum/maximum inventory controls
Detail the replenishment planning process

Advance Topics

- The periodic review system
- Normal distribution diagram
- Measuring inventory performance
- Calculation order points with supplier lead time uncertainty
- Cycle counting processing

Session 5: Distribution Requirements Planning (DRP)

Describe distribution channel dependencies
Detail “Push” system functions
Detail “Pull” system functions
Decide what to choose: reorder points or DRP?
Define distribution requirements planning (DRP)
Explore time phasing – the heart of DRP
Understand the DRP planning grid
Calculate the projected available balance (PAB) and the DRP grid
Calculate net requirements and the DRP grid
Review the DRP planned order generation
Perform PAB and net requirements recalculation
Explore DRP and the bill of distribution (BOD)
Outline the DRP planning process
Perform a full DRP calculation

Advanced Topics

Fair share allocation
Using safety stock in DRP
Using DRP for logistics capacity planning
Developing a warehouse capacity plan
Exploring distribution resources planning (DRP II)

Session 6: Mid-Term Exam

Session 7: Warehouse Management

Define warehouse management
Detail warehouse functions – material handling, product storage, order management, and information transfer
Describe the different types of warehouse – private, public, contract, and intransit
Explore the basic objectives of warehousing
Review warehousing strategic decision components
Use of third party logistics (3PL) service providers in warehousing strategy
Detail the warehouse operational management process
Discuss the importance of warehouse work standards
Describe the warehouse receiving flow
Examine the functions of warehouse stocking activities
Illustrating the components of successful warehouse inventory transaction management
Outline the order picking and shipping flow
Emphasize the importance of warehouse performance measurements

Advanced Topics

- Specialized warehousing services
- Warehouse strategy steps
- Developing warehouse time standards
- Annual physical inventory and cycle counting
- Approaches to measuring logistics performance

Session 8: Packaging and Material Handling

- Define warehouse design and layout objectives
- Determine warehouse size and capacity
- Describe basic warehouse layouts
- Understand warehouse layout development
- Detail warehouse design layout principles
- List the key principles of materials handling
- Classify the types of storage systems
- Outline large-item or large-volume product storage
- Review small-item or low-volume product storage
- Review automated storage systems
- Discuss stocking inventory in warehouse locations
- Describe dock materials handling equipment
- Describe mobile materials handling equipment
- Define the role of packaging and unitization
- List the key drivers of warehouse automation
- Detail the components of warehouse automation

Advanced Topics

- Cube utilization and accessibility
- The cross-docking warehouse
- Advanced dock door management
- Warehouse space calculation
- Shipping containers
- Environmental impact of packaging

Session 9: Transportation Management

- Define transportation management
- Understand the fundamental principles of transportation
- Detail the principles of transportation operations
- Describe transportation participants
- Outline the load transport aspects of transportation services

- Outline the product storage aspects of transportation services
- Explain the relationship of transportation to other business functions
- Classify the modes of transportation: motor railroad, air, water, pipelines, and intermodal
- Describe the types of transportation carriers
- Define the functions and impact on transportation of third-party logistics (3PLs)
- Outline the various forms of logistics outsourcing models
- Detail the challenges facing today's transportation industry

Advanced Topics

- Private fleet management
- Choosing a logistics service provider (LSP)
- Advantages and risks of a logistics service provider (LSP)

Session 10: Transportation Operations

- Describe the principles of transportation operations
- Review the role of transportation administration
- Detail the types of transportation risk
- Outline the components of the transportation management process
- Classify the elements of transportation cost
- Review the detail components of transportation cost
- Understanding transportation rates and pricing
- Explain domestic transportation terms of sale
- Detail the steps in transportation mode selection
- Detail the steps in transportation carrier selection
- Review transportation routing and scheduling functions
- Review transportation documentation and post-shipment processing
- Outline transportation performance management
- Define transportation management technologies

Advanced Topics

- Transportation risk mitigation - methodology
- Transportation rates and pricing
- Transportation rate negotiation
- Transportation contract estimating
- International terms of sale

Session 11: Final Exam

V. 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