

MATERIALS MANAGER COMPETENCY MODEL



INTRODUCTION

Materials managers support the complete cycle of material flow—from the purchase and control of materials to the planning and control of work in process and the finished product. In short, these professionals ensure that an organization's available goods can satisfy the demands of customers. Organizations depend on effective materials managers to minimize waste, manage inventory levels, and ensure that output is in line with the company's balance sheet.

APICS The Association for Operations Management is the premier membership organization providing education, certification, and career development opportunities to supply chain professionals worldwide. The APICS Certified in Production and Inventory Management coursework and corresponding certification gives professionals the knowledge and skills they need to be successful. Knowledge and skills combined with work experience create the competencies required for individuals to excel in their careers and distinguish themselves in their field. In recognition of this, APICS developed the Materials Manager Competency Model to guide individuals considering careers in materials management, materials management professionals seeking to advance their positions, and human resource managers who are hiring in this field. management professionals seeking to advance their positions, and human resource managers who are hiring in this field.

ABOUT THE MODEL

The structure of the APICS Materials Manager Competency Model follows guidelines set by the Employment and Training Administration of the United States Department of Labor. The model is visually represented in a diagram for easy reference, as seen on the following page. The model is organized into tiers of competencies and includes descriptions of the activities and behaviors associated with each competency. The Competency Model Clearinghouse defines competency as “the capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform ‘critical work functions’ or tasks in a defined work setting.” In many cases, the competencies outlined in this model are adapted from the *APICS Operations Management Body of Knowledge (OMBOK) Framework*.

ACKNOWLEDGMENTS

The APICS Materials Manager Competency Model was a research project undertaken by staff in the professional development division of APICS. They were supported by the APICS 2009 Future Leaders. In addition, APICS staff and leaders used public domain information obtained from the Competency Model Clearinghouse (www.Careeronestop.org) in the model’s creation.

MATERIALS MANAGER DIAGRAM

Occupation-related

Materials Manager Specific Requirements

includes requirements such as certification, licensure, and specialized educational degrees, or physical and training requirements for materials managers.

- Bachelors or equivalent degree
- Supply chain industry association membership
- Supply chain-specific certifications

Profession-related

Materials Manager Knowledge Areas and Technical Competencies

represent the knowledge, skills, and abilities needed by materials managers.

- Transportation, distribution, logistics
- Warehousing
- Inventory management
- Production planning
- Queuing and simulation
- Planning processes
- Risk management
- Enterprise resources planning and Manufacturing resource planning
- Sales and operations planning
- Demand management and forecasting
- Master planning
- Warehouse management systems
- Security and hazardous materials regulations
- Supply chain synchronization
- Strategic sourcing and purchasing
- Vendor managed inventory

Operations Management Knowledge Areas and Technical Competencies

represent the knowledge, skills, and abilities needed by all occupations within operations management, including materials managers.

- Operations strategy
- Manufacturing process environments
- Standards (time measurement)
- Supply chain management
- Process improvement and six sigma
- Execution, planning, scheduling control
- Lean management
- Sustainability
- Enabling technology application

Foundational

Workplace and Leadership Competencies

represent those skills and abilities that allow individuals to function in an organizational setting.

- Problem solving and decision making
- Teamwork and collaboration
- Accountability and responsibility
- Customer focus (internal and external)
- Planning and organizing
- Conflict management
- Supporting and training staff

Academic Competencies

are primarily learned in an academic setting, and include cognitive functions and thinking styles.

- Math, statistics, and analytical thinking
- Reading and writing for comprehension
- Applied science and technology
- Supply chain fundamentals
- Foundations of business management
- Materials management fundamentals
- Operations and enterprise economics

Personal Effectiveness Competencies

represent motives and traits as well as interpersonal and self-management styles and generally are applicable to a number of industries at a national level.

- Awareness of the needs of others
- Integrity
- Continuous learning
- Effective communication
- Interpersonal skills
- Creativity

FOUNDATIONAL COMPETENCIES

PERSONAL EFFECTIVENESS COMPETENCIES

Personal effectiveness competencies represent motives, traits, and interpersonal and self management styles, and are applicable in any number of industries.

Awareness of the needs of others

- Understand other business needs and goals.
- Have perspective into other points of view.
- Build rapport and credibility with colleagues.
- Anticipate needs and respond to concerns and conflicts.

Integrity

- Demonstrate trustworthiness and professionalism with clients, peers, and team members.
- Respond with consistency in situations that require honesty and candor.
- Avoid conflicts between work and personal interests or activities.

Continuous learning

- Demonstrate an interest in personal learning and development; seek feedback from multiple sources about how to improve and develop; modify behavior based on feedback or self-analysis of past mistakes.
- Take steps to develop and maintain the knowledge, skills, and expertise necessary to achieve positive results; participate fully in relevant training programs and actively pursue other opportunities to develop knowledge and skills.
- Anticipate changes in work demands and participate in assignments or training that address these changing demands; treat unexpected circumstances as opportunities to learn.
- Engage in career development by identifying occupational interests, strengths, options, and opportunities; make insightful career planning decisions based on integration and feedback; seek out additional training to pursue career goals.

Effective communication

- Express information to individuals or groups considering the audience and the nature of the information (e.g., technical or controversial); speak clearly and confidently; organize information in a logical manner; speak using common English conventions including proper grammar, tone and pace; track audience responses and react appropriately to those responses; effectively use eye contact and nonverbal expression.
- Receive, attend to, interpret, understand, and respond to verbal messages and other cues; pick out important information in verbal messages; understand complex instructions; appreciate feelings and concerns of verbal messages.
- Practice meaningful two-way communication by speaking clearly, paying close attention and seeking to understand others, listening attentively and clarifying information and attending to nonverbal cues and respond appropriately.
- Influence others; persuasively present thoughts and ideas; gain commitment and ensure support for proposed ideas.

Interpersonal skills

- Relate well to clients, colleagues, and team members.
- Maintain a positive, supportive, and appreciative attitude.
- Actively listen to others and demonstrate an understanding of their point of view.
- Create an open environment that encourages people to work together to solve problems and improve practices and services.
- Explore and resolve conflicts as they arise.
- Communicate clearly to avoid misunderstanding.

Creativity

- Demonstrate intellectual curiosity about why things are the way they are.
- Challenge the status quo.
- Change, elaborate, adapt, and improve own ideas or those of others.
- Demonstrate a bias towards action; materialize thoughts into products or services.

ACADEMIC COMPETENCIES

Academic competencies are primarily achieved in an academic setting and include cognitive functions and thought processes.

Math, statistics, and analytical thinking

- Practice applied mathematics in collecting and interpreting quantitative data.
- Demonstrate the ability to scrutinize and break down facts and thoughts into their strengths and weaknesses.
- Develop the capacity to think in a careful and discerning way, to solve problems, to analyze data, and to recall and apply information.

Reading and writing for comprehension

- Understand what has been read; gather information from a text.
- Demonstrate an understanding of material read by forming opinions and sharing personal experiences.
- Apply the strategies of self-questioning, retelling, writing, summarizing, predicting and verifying, story mapping, role play and responsiveness.

Applied science and technology

- Demonstrate an understanding of the factors that are considered important to the branch of knowledge or technology.
- Understand the use of technology and the interaction with life, society, and the environment, in conjunction with such subjects as industrial arts, engineering, applied science, and pure science.
- Develop knowledge of specific tools and how they affect the ability to adapt to and control the environment.
- Demonstrate the ability to apply knowledge or understanding to meet a specific, recognized need.
- Possess knowledge that is sufficiently general, clearly conceptualized, carefully reasoned, systematically organized, critically examined, and empirically tested with regard to the specific science or technology.

Supply chain fundamentals

- Understand that supply and logistics is a system of organizations, people, technology, activities, information, and resources involved in moving a product or service from supplier to customer.
- Possess basic knowledge of supply chain activities, including transformation of natural resources, raw materials, and components into a finished product that is delivered to the end customer.
- Recognize the ways that supply chains link value chains.

Foundations of business management

- Understand all management activities carried out in the course of running an organization, including controlling, leading, monitoring, adjusting, organizing, and planning.
- Analyze financial statements and explain the implications of standard financial ratios and all components of the balance sheet and income statement.
- Create interactive decision support models that demonstrate the sensitivity of outcome to multiple independent variables.
- Calculate project and organizational cash flow forecasts; present value investment comparisons and risk-adjusted return calculations.
- Demonstrate knowledge of visual presentation techniques including charting, histograms, and flow sheets, and oral and written presentation techniques.
- Practice basic business communications.
- Understand fundamental organizational behavior.

Materials management fundamentals

- Demonstrate knowledge of the operations management structure of the modern manufacturing and distribution company.
- Convert and communicate demand requirements for products and service into detailed plans and schedules for inventory acquisition.
- Calculate key inventory performance metrics such as turnover ratios, cost-benefit trade offs, days of inventory on hand, labor productivity, and inventory valuation.
- Calculate and apply the various costing and valuation methods to inventory management.
- Have detailed knowledge of manufacturing planning, master production scheduling, product definition, inventory control, materials requirements planning, capacity requirements planning shop floor control, warehousing, transportation, and purchasing business functions.
- Understand standard enterprise resource planning (ERP) and supply chain management (SCM) system technologies.
- Incorporate methods and techniques involved in lean and Just-in-Time (JIT) management.
- Implement new technologies.
- Be capable of performing human resource management functions.
- Participate in strategic planning and control development with senior management.
- Understand basic principles of sustainability, including reverse logistics, reworking product lines, and cutting operational energy costs.

Operations and enterprise economics

- Understand the importance of and demonstrate the ability to take raw materials or knowledge and convert it into a product or service that has more value to the customer than the original material or data.
- Determine the success or failure rate of a business using financial accounting, incorporating terms and techniques including income, expense, cost of goods sold, gross margin, balance sheet, return on assets, inventory turns, capital asset management, and cash management.
- Employ the technique of break-even analysis, which finds the break-even point, the volume at which revenues exceed total costs.
- Find the best operating level (BOL), the level of capacity a process was designed for.
- This is also the volume of output at which average unit cost is minimized.
- Use cost accounting systems to keep track of all costs of building products, labor, material, overhead, and variances. These systems include activity-based costing (ABC) and cost analysis and control.

WORKPLACE AND LEADERSHIP COMPETENCIES

Workplace competencies represent those skills and abilities that allow individuals to function in an organizational setting.

Problem solving and decision making

- Practice goal-directed thinking and action in situations for which no routine solutions exist.
- Understand a problem situation and its step-by-step transformation based on planning and reasoning.
- Demonstrate ability to choose between alternative courses of action using cognitive processes such as memory and evaluation.
- Demonstrate ability to map processes of possible consequences of decisions, to work out the importance of individual factors, and to choose the best course of action.

Teamwork and collaboration

- Demonstrate a commitment to the mission and motivation to combine the team's energy and expertise to achieve a common objective.
- Understand the dynamics of effective teamwork in order to attain higher levels of performance.
- Demonstrate ability to work as part of a tight-knit and competent group of people.
- Demonstrate a commitment to engage teams in other departments or divisions of the organization.

Accountability and responsibility

- Demonstrate a willingness to accept responsibility and accountability for one's actions.
- Exhibit a moral, legal, or mental accountability in areas of responsibility.
- Understand that these two workplace competencies are intertwined, and that both abilities must be present in order to succeed.

Customer focus (internal and external)

- Understand this is an organizational orientation toward satisfying the needs of potential and actual customers.
- Ensure that the whole organization, not just frontline service staff, puts customers first.
- Ensure all activities, from the planning of a new product to production, marketing, and after-sales care, are built around the customer.
- Understand that every department and every employee should share the same customer-focused vision.
- Practice good customer relations management and maintain a customer relations program.
- Demonstrate ability to balance the needs of the organization and the needs of the customer.

Planning and organizing

- Effectively plan what is to be achieved and involve all relevant staff members.
- Anticipate important or critical events, identifying resource requirements and assigning responsibility for specific work, including deadlines and performance expectations.
- Demonstrate the use of information-gathering techniques, analyzing situation and identifying implications in order to make correct decisions.
- Demonstrate ability to monitor progress and to make changes as required.
- Ensure that staff is aware they will be accountable for achieving the desired results through planned program evaluation and individual performance appraisal.
- Ensure that staff is provided with the necessary tools to succeed.

Conflict management

- Demonstrate ability to manage conflict by identifying and handling conflicts in a sensible, fair, and efficient manner.
- Demonstrate skill in effective communicating, problem solving, and negotiating with a focus on party interests.

Supporting and training staff

- Understand the importance of facilitating on-going professional development opportunities for staff.
- Assess training needs and identify means (for example, classes, mentoring, written materials) to fill skill gaps.
- Provide opportunities for staff to demonstrate leadership skills.
- Provide clear and meaningful performance evaluation.
- Encourage the development of skills that increase personal and departmental productivities.

PROFESSION-RELATED COMPETENCIES

OPERATIONS MANAGEMENT KNOWLEDGE AREAS AND TECHNICAL COMPETENCIES

Operations management knowledge areas and technical competencies represent the knowledge, skills and abilities needed by all occupations within operations management, including materials managers.

Operations strategy

- Ensure the alignment of the materials management strategy with the business strategies driving sales, marketing, finance, and manufacturing.
- Develop inventory and plant asset management strategy supportive of company investment and capital management plans.
- Demonstrate ability to consistently deliver products and services to meet customer needs.
- Develop strategic objectives that focus on areas of quality, cost, flexibility, productivity, and speed.
- Consistently search for methods to develop an agile and committed departmental workforce.

Manufacturing process environments

- Close understanding and practical knowledge of a company's manufacturing processes and equipment capabilities.
- Encourage a close working relationship between manufacturing and materials management personnel.
- Develop materials storage and delivery processes supportive of manufacturing operations.
- Assist manufacturing with process improvement and lean initiatives.
- Assist manufacturing management in the development of meaningful productivity and performance measurements.
- Understand the influence of demand on manufacturing process design.
- Ensure processes conform to both the needs of the customer base and the characteristic of the product.
- Ensure the continuous availability of quality materials and finished components.
- Understand output of materials requirement planning (MRP), capacity management, and advanced planning system technologies.

Standards (time measurement)

- Assist manufacturing engineering in the development of process productivity standards.
- Understand calculations for efficiency, utilization, and productivity.
- Demonstrate ability to calculate nominal and demonstrated productive capacities.

Supply chain management

- Demonstrate ability to manage the network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers.
- Understand that supply chain management spans all movement and storage of raw materials, working process inventory, and finished goods from point-of-origin to point-of-consumption.

Process improvement and six sigma

- Understand the systematic approach to closing of process or system performance gaps through streamlining and cycle time reduction, and identify and eliminate causes of quality below specifications, process variation, and non-value-adding activities.
- Maintain company processes that afford optimum operation and enhance the company's quality management system.
- Demonstrate ability to visualize the total process and aid in locating problem areas using process mapping, quality improvement, and visualization tools to locate, quantify, and correct root causes of problems.
- Perform periodic evaluations to maintain processes by gathering pertinent information such as problem symptoms from knowledgeable sources and carrying these through to the problems, potential causes, and root causes of the problem.
- Hold gains in process improvements by establishing key performance measurements, benchmarking metrics, and continuous process improvement initiatives to improve process quality on a continual basis.

Execution, planning, scheduling, and control

- Determine the need for material and capacity to address expected demand, execute the resulting plans, and update planning and financial information to reflect the results.
- Plan the management function by defining goals and the tasks and resources needed to attain those goals.
- Schedule a timetable of events and decide when and where certain events will occur.
- Control and check errors, taking any corrective action so that deviations from standards are minimized and stated goals of the organization are achieved in a desired manner.

Lean management

- Identify and reduce or eliminate waste in all areas of a supply chain.
- Calculate the total system cost of delivering a product or service to the customer.
- Develop systems that allow employees to produce results by:
 - Educating suppliers to create value for customers by streamlining processes in the value chain.
 - Using suppliers whose methods and core competencies will align with lean requirements and developing long-term relationships with them.
 - Reducing or entirely eliminating the cost of changing from one product or service to another.

Sustainability

- Understand current industry and government regulations governing sustainability.
- Be able to calculate carbon footprint of business processes.
- Develop processes that strive to eliminate waste.
- Incorporate renewable raw materials.
- Assemble an effective reverse logistics program.
- Pursue transportation alternative to reduce energy and emissions.
- Utilize safe and reusable containerization.
- Pursue paperless documentation.
- Coordinate shipping and freight to use full truckloads.
- Convert outputs to inputs; recycle end-products and components when possible.

Enabling technology education

- Recognize that continuous process improvement is an accepted way of life in business and that few companies lack a continuing quality or process improvement effort.
- Implement improvement methods such as business process re-engineering, total quality management (TQM), six sigma, lean manufacturing, and theory of constraints (TOC).
- Understand that technology and process functionality has an interconnected relationship and that each helps transform the other.
- Initiate process improvements that are enabled and supported by technology.

MATERIALS MANAGERS KNOWLEDGE AREAS AND TECHNICAL COMPETENCIES

Materials manager knowledge areas and technical competencies represent the knowledge, skills, and abilities needed by materials managers.

Transportation, distribution, and logistics

- Manage transportation operations.
- Maximize freight loads while minimizing freight costs.
- Ensure efficient use of transportation resources while meeting the needs of the customer.
- Move material, usually one organization's finished goods or service parts, from the manufacturer or distributor downstream to the customer.
- Transfer goods and services from the raw materials suppliers and producers to the end users or consumers.
- Apply the cross-docking technique when bringing items into a distribution center for immediate dispatch.
- Divide truckloads of homogeneous items into smaller, more appropriate quantities for use by break-bulk handling.
- Consolidate several items into larger units for fewer handlings; for example, placing items in boxes loaded and wrapped as a pallet by unitization packaging.
- Apply logistics with the movement of personnel, and the design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of material.
- Develop and implement a formal logistics strategy.
- Develop and implement a reverse logistics plan.

Warehousing

- Receive, store, and ship materials to and from production or distribution locations by incorporating warehousing activities.
- Configure warehouses to have formal storage locations that identify the row, rack section, level, and shelf location, typically with an alphanumeric location bar code or label.
- Place high-turn items close to packing and shipping areas, which will reduce picking, put-away times, and transportation within the warehouse.
- Select random locations when travel distances are not an important consideration and when overall utilization of warehouse space is important.

Inventory management

- Be capable of determining departmental inventory management strategies and objectives.
- Know how to set up an effective inventory control department.
- Know how to apply trade-off analysis to balance requirements of demand and supply.
- Understand the different classes of inventory (raw materials, WIP, finished goods, MRO, service parts, damaged, and obsolete).
- Understand the difference between independent and dependent demand inventory.
- Know how to define the five functions of inventory: cycle inventory, safety inventory, anticipation inventory, transportation inventory, and hedge inventory.
- Know how to determine the elements of inventory decision costs such as fixed, variable, direct, overhead, and costs
- Know how to calculate inventory carrying costs.
- Know how to calculate manufacturing and purchasing costs.
- Effectively manage surplus and obsolete inventories.
- Understand the methods of valuing inventory: standard; first in, first out (FIFO); last in, first out (LIFO); average; and actual cost.
- Understand the difference between continuous and period review systems of inventory control.
- Effectively calculate the inventory required to restock products or parts with inventory models including inventory audits, annual physical inventory, and cycle counting.
- Effectively calculate safety stock for independent demand items.
- Be able to calculate the order quantity through the economic order quantity (EOQ).
- Maintain high inventory accuracy through various techniques including inventory audits, annual physical inventory, and cycle counting.
- Generate reporting detailing inventory financial statements, turnover ratios, activity based cost (ABC) analysis, and inventory performance.
- Be aware of the latest electronic data collection technologies.
- Understand lean and JIT concepts and practices.
- Be able to set up and run a pull system of inventory control.
- Effectively calculate kanban card requirements.
- Develop kaizen event teams to remove inventory and process wastes and speed inventory throughput.

Production planning

- Demonstrate ability to establish a manufacturing planning department consisting of master scheduling, production planning, and open-manufacturing order management.
- Understand the sales and operations planning (S&OP) process.
- Understand the relationships between the production plan, sales plan, and overall business plan.
- Identify current planned level of demand and create tactical production plans to meet the identified customer demand.
- Demonstrate knowledge of the various methods to establish and work with bills of material (BOMs).
- Calculate production lead times.
- Understand scheduling techniques using forward scheduling and backward scheduling.
- Demonstrate knowledge of techniques to manage infinite loading and finite loading.
- Understand how to manage load leveling and bottleneck scheduling.
- Demonstrate knowledge of theory of constraints (TOC) and drum-buffer-rope scheduling methods.
- Analyze production floor status through input/output control reporting.
- Effectively analyze if inventories need to be maintained, raised or lowered.
- Coordinate information with other functional staff, including, sales, engineering, accounting, finance, marketing, and human resources.
- Establish reporting to determine labor and productivity performance statistics.

Queuing and simulation

- Initiate simulations to evaluate planned operational changes.
- Analyze impacts of varying queue lengths with queuing models and simulation software.
- Effectively analyze simulation output to determine the best operational rules and structural changes to enact.

Planning process

- Demonstrate detailed knowledge of integrating production and materials planning with the business plan.
- Fully understand modern planning concepts and practices.
- Demonstrate ability to use spreadsheet and enterprise resources planning software in managing the planning process.
- Understand the discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives.
- Demonstrate ability to define an effective project plan.
- Define the project resources, such as money, people, materials, and space, the milestones, and specific outcomes.

Risk management

- Accurately identify risks affecting supply, transformation, delivery, and customer demand.
- Develop strategies such as dual sourcing, buffering, and forward buying that minimize financial impact uncertainties such as yields, timing, pricing, and catastrophic events.
- Effectively analyze the probability, control, and impact of risks identified.

Enterprise resources planning (ERP), manufacturing resource planning (MRP II), material requirements planning (MRP)

- Demonstrate ability to define ERP/MRP II software systems.
- Demonstrate ability to explain the components of a modern ERP system.
- Demonstrate knowledge of the foundations of ERP systems.
- Understand the basic principles and operations of ERP systems.
- Understand the integration of company functions provided by an ERP system.
- Establish ERP planning procedures. Understand load versus capacity output reporting.
- Collaborate with functional departments to discuss and react to changes in demand.
- Explain MRP time-phased planning logic.
- Understand the role of the bill of material in ERP.
- Describe how safety stock is managed in MRP.
- Understand the various types of order policies available in MRP order generation.
- Apply the application of independent and dependent demand to ERP.
- Calculate scrap and shrinkage factors into the MRP generation.
- Understand the MRP gross-to-net explosion process.
- Evaluate the contents and calculations on the MRP grid display/report.
- Demonstrate knowledge of planning utilizing action messaging.
- Demonstrate knowledge of planning time fences in MRP.
- Understand the types of replenishment orders found in the MRP grid.
- Demonstrate ability to work with pegged requirements in MRP.
- Understand how to perform order rescheduling in MRP.
- Understand the various MRP output reports.
- Establish when MRP is to be generated.
- Demonstrate knowledge of capacity requirements planning (CRP).
- Demonstrate detailed knowledge of the components necessary to run CRP: work centers, labor/machines, routings, setup times, run, standards, and move times.
- Demonstrate knowledge of increasing and decreasing capacity.
- Demonstrate ability to use CRP to reschedule open and MRP-generated orders.
- Understand load versus capacity output reporting.
- Collaborate with functional departments to discuss and react to changes in demand.
- Understand ERP support for advanced planning systems.

Distribution requirements planning (DRP)

- Understand the definition of DRP.
- Establish DRP planning procedures.
- Understanding of the components of the DRP planning system.
- Build a bill of distribution (BOD) for the DRP explosion.
- Demonstrate knowledge of the links between MRP and DRP.
- Understand the sources of distribution demand in a DRP system.
- Describe DRP order policies for planned order generation.
- Describe how safety stock is used in DRP planning.
- Understand the DRP gross-to-net calculation.
- Use the DRP output grid to describe planning requirements.
- Use exception reporting to determine order action.
- Describe the types of planned orders generated by DRP.
- Describe the meaning of DRP action messages
- Use pegged requirements for DRP scheduling and rescheduling actions.
- Demonstrate knowledge of DRP for financial estimating, transportation planning, warehousing, and labor and equipment capacity planning.
- Understand the integration of DRP with supply chain management and supply chain event-management software suites.

Sales and operations planning (S&OP)

- Understand the definition of S&OP.
- Effectively communicate the operational perspective in cross-functional meetings.
- Demonstrate knowledge of the structure and logic of the S&OP process.
- Understand the components of the S&OP process.
- Demonstrate ability to establish an S&OP program, define operating procedures, and establish a S&OP planning team from the different parts of an organization.
- Demonstrate ability to work effectively with other members of the S&OP team.
- Demonstrate ability to assemble the data necessary to run the S&OP process.
- Understand how to calculate the S&OP plan output.
- Evaluate output and propose changes to the S&OP plan.
- Demonstrate ability to work with S&OP in different manufacturing environments.
- Integrate S&OP with financial output.
- Communicate plan changes to production and inventory planning.

Demand management and forecasting

- Understand the principles and applications of demand forecasting.
- Demonstrate knowledge of the critical requirements for effective forecasting: establishing time horizons, determining the level of forecasting detail, and determining the forecastable database.
- Demonstrate ability to establish policies and procedures to ensure forecast control.
- Demonstrate knowledge of the three forecasting techniques: judgmental (qualitative) forecasts, quantitative (time-series) forecasts, and causal (extrinsic) forecasting.
- Demonstrate ability to discuss and work with time-series analysis in forecast data preparation.
- Demonstrate ability to apply time-series methods to work with horizontal, random, seasonal, trend, and cyclical demand.
- Understand subjective, causal, and time-series forecasting methods, including:
 - Averages
 - Time series (exponential smoothing)
 - Trend
 - Seasonality
 - Regression models
 - Focus forecasting
 - Establish key performance indicators of forecast accuracy.
 - Define the purpose of the forecast.
 - Prepare the statistical components of a forecast.
 - Demonstrate ability to determine forecast error.
 - Ensure the interaction of the firm's functional managers, and track and maintain the forecast through timely and accurate feedback.

Master planning

- Demonstrate ability to translate the production plan into a time-phased build schedule.
- Understand how to work with planning bills of material.
- Understand the planning requirements for managing make-to-stock, make-to-order, assemble-to-order, and engineer-to-order manufacturing environments.
- Understand the concept of forecast consumption by actual sales orders.
- Establish the demand and planning time fences.
- Establish policies for time fence management.
- Demonstrate knowledge of performing cumulative lead time analysis.
- Understand the mechanics of the master schedule calculation logic.
- Understand the tasks in managing the available-to-promise and capable-to-promise portion of the master schedule.
- Demonstrate ability to schedule demand based on the product mix.

- Understand the role of managing safety stock in the master schedule.
- Manage schedule changes through system generated action messages
- Demonstrate ability to use the rough-cut capacity plan.
- Assemble master schedule reporting regarding performance to the business plan, the shipment plan, the inventory plan, and the production plan.

Warehouse management systems (WMS)

- Demonstrate knowledge of the applications available in a WMS.
- Demonstrate knowledge of the necessary steps to integrate WMS and ERP systems.
- Develop standardized processes, instructions, rules, and parameters for warehouse management in the initial software implementation.
- Demonstrate knowledge of performing warehousing planning in a WMS.
- Input receiving, storing, bin selecting, picking, and shipping tasks offered by WMS application functionality. distribution centers, warehouses, and customers through a logistics network.

Security and hazardous materials regulations

- Comply with security regulations established by the U.S. Department of Homeland Security.
- Demonstrate knowledge of various trade agreements, such as the North American Free Trade Agreement and those of the European Union.
- Demonstrate knowledge of the key hazardous materials handling laws established by the U.S. Environmental Protection Agency.
- Identify and implement proper packing and labeling methods for transportation of hazardous materials.
- Ensure all staff handling hazardous materials receives training on safety and compliance regulations.
- Create lean and green programs for energy and materials use reduction.
- Establish efficient reverse logistics and recycling programs.
- Determine most effective ways of disposing of hazardous wastes.
- Work with purchasing and manufacturing to target waste and hazardous materials reduction.

Supply chain synchronization

- Analyze the company's external and internal environments to identify promising strategic options for the company.
- Analyze the principle competing pressures in your market.
- Develop reliable estimates of competitor resources and strategic plans in order to anticipate next moves and to avoid being surprised.
- Determine an enterprise's key success factors (those things a company needs to "get right" to be successful).
- Assess your company's current strategy by examining your competitive approach using quantitative and other performance measures.
- Conduct a SWOT (strengths, weaknesses, opportunities, and threats)

Strategic sourcing and purchasing

- Strategic sourcing and purchasing
- Effectively locate and source key materials suppliers, while analyzing the total cost associated with procuring an item or service.
- Focus on developing and maintaining long-term relationships with trading partners who can help the purchaser meet profitability and customer satisfaction goals.
- Integrate automation of request for quote (RFQ), request for proposal (RFP), electronic auctioning, business-to-business commerce (B2B), and contract management processes when using a strategic sourcing approach
- Establish methods of meeting customer satisfaction goals.

Vendor-managed Inventory (VMI)

- Demonstrate knowledge of establishing an onsite customer inventory management program.
- Establish objectives of the VMI program.
- Establish performance reporting to ensure quality and profitability.
- Integrate the customer requirements into the business planning system.
- Demonstrate ability to manage remote staff.

OCCUPATION-RELATED COMPETENCIES

MATERIALS MANAGER SPECIFIC REQUIREMENTS

Materials manager specific requirements such as certification, licensure, and specialized educational degrees, or physical and training requirements for materials managers.

Post-secondary education

- The majority of materials management professionals hold post secondary degrees — a bachelor's or equivalent.
- While a number of materials management professionals have degrees related to supply chain or operations management, the majority hold degrees in other fields including but not limited to, business, economics, engineering, or liberal arts studies.

Association membership

Professional association membership ensures that materials management professional can link into a network of practitioners to share best practices, develop their careers, and continue their professional educations. There are a number of supply chain associations related to specific industries, including but not limited to:

- APICS The Association for Operations Management (APICS)
- Institute of Supply Management (ISM)
- Supply Chain Council (SCC)
- Council of Supply Chain Management Professionals (CSCMP)

Certifications

Once the professional is in the workplace, it is desirable to obtain a materials management specific certification. While there are a number of materials management certifications related to specific industries, general certifications include:

- APICS Certified in Production and Inventory Management (CPIM)
- APICS Certified Supply Chain Professional (CSCP)
- ISM Certified Professional in Supply Management (CPSM)

ABOUT APICS

APICS is the leading professional association for supply chain and operations management and the premier provider of research, education and certification programs that elevate end-to-end supply chain excellence, innovation and resilience. APICS Certified in Production and Inventory Management (CPIM) and APICS Certified Supply Chain Professional (CSCP) designations set the industry standard. With over 37,000 members and more than 250 international partners, APICS is transforming the way people do business, drive growth and reach global customers.