

<b>LSCM 2003</b>	<b>Materials Management (MM)</b>	L	T	P	C
<b>Version 1.0</b>		3	0	0	3
<b>Pre-requisites/Exposure</b>	12 <sup>th</sup> Std. or Equivalent				
<b>Co-requisites</b>	Knowledge of ‘principles of management’, ‘operations management’, and working knowledge of computer applications				

### Course Objectives

- To understand how the knowledge of materials management can be an advantage to logistics and supply chain operations.
- To sensitize the students on the materials management functions – Planning, Purchase, Controlling, Storing, Handling, Packaging, Shipping and Distributing, and Standardizing.
- To realize the importance of materials both in product and service.
- Use of MRP, ERP and PLM in managing materials

### Course Outcomes

On completion of this course, the students will be able to meet:

- CO1. Identifying the scope for integrating materials management function over the logistics and supply chain operations.
- CO2. Integrate the organization wide materials requirement to develop an overall plan (MRP).
- CO3. Identify, study, compare, and evaluate alternatives, select and relate with a good supplier.
- CO4. Apply various purchasing method and inventory controlling techniques into practice.
- CO5. Analyzing the materials in storage, handling, packaging, shipping distributing and standardizing.
- CO6. Integrate important materials functions to both products and services & use MRP,ERP,& PLM managing materials

### Catalog Description

Materials Management deals with the planning organizing and controlling of materials in flow, storage and use, from raw material to finished goods. It will explore the opportunities to analyze and decide improvements in managing materials related functions beyond the traditional practices. Attention to be paid to the materials management functions over the product-service continuum i.e. from pure products to pure services. Materials analysis can be done with a design perspective for products and services with new materials (in existing products) or new products (from existing materials). Care will be taken to strike a balance between theoretical and practical perspectives.

### Course Content

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#### Unit I: INTRODUCTION TO MATERIALS MANAGEMENT

[12 Lecture Hours]

Introduction, Functions of Materials Management (MM) – planning, purchasing, procurement, storage, inventory control, analysis; Concepts of BOM, Make or Buy; Modern Trends – Lean and JIT; ERP and PLM; MM in Government Sector and Projects; Materials Budget; Material Forecasting; Sourcing and Outsourcing; Transportation Modes; Capacity Planning for Warehouses; Selection of Supplier, and Supply Chain Partners.

Materials Management in ERP Mode (SAP MM – Overview, Screen Navigation; Organization Structure, Enterprise Structure; Organizational Units).

**Unit II: PLANNING, PURCHASING & PROCUREMENT [12 Lecture Hours]**

MM with respect to MPS, PPC, Sales & Operations Planning; Planning from BOM to MRP, and JIT. Capacity and Equipment Planning; Equipment Replacement Plan; Purchasing – policies, principles, and practices; Procurement Scheduling. T&C Negotiation and Contract (incl. Import). Inbound Material Quality Planning and Controlling; Supplier Quality Assurance; Supplier/ Vendor Development; Documents & Dashboards in Material Planning.

Materials Management in ERP Mode (SAP MM – Procurement Process, Procurement Cycle; Master Data; Purchase Info Record, Source Determination/List; Purchase Requisition, RFQ i.e. Request for Quotation; Outline Agreement; Quota Arrangement, Posting Period; Purchase Order Types)

**Unit III: MATERIAL HANDLING, STORAGE & CONTROL [12 Lecture Hours]**

Materials Handling Principles; Materials Handling Equipment, Capacity Utilization, MHES, Records and Documents; Order Handling; Tracking, Monitoring and Controlling of Materials; Stores – Centralized Vs. Decentralized; Materials Accounting, Valuation, Inventory (Value) Analysis, Verification, Audit. Inventory Control/Management Zero-Inventory Vs. Safety Stock Physical Distribution; Transportation & Traffic Mgt., Materials Management Information System (MMIS). Role of Standardization, Simplification, Ergonomics, Coding, JIT in MM.

Materials Management in ERP Mode (SAP MM – Inventory Management; Invoice Verification; Service Management, Valuation; Account Determination, Configuration, Transaction Codes, Interview Questions)

**Text Book**

*A. K Datta*, Materials Management, Ed. 2005, Prentice-Hall of India Pvt. Limited, New Delhi, India.

**Reference Books**

1. Operations & Supply Management; Richard B Chase, Ravi Shankar, F Robert Jacobs & Nicholas J Aquilano; McGraw-Hill Publishing Company Ltd.
2. Materials Management System, Brown, R. B., John Wiley & Sons, New York.
3. Materials Management: An Integrated Approach, Gopalakrishnan, P. & Sundaresan, M., Prentice-Hall of India.
4. Purchasing and Materials Management, Lee, L.(Jr.) & Dobler, D. W., Tata McGraw-Hill Publishing Co.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination Examination Scheme:**

Components	MSE	Internal Assessment (Class Participation, Individual/Group Assignments, Case Analysis/ Quizzes/Viva, Class Tests)	ESE
Weightage (%)	20	30	50

### Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Programme Outcomes
<b>CO1</b>	Identifying the scope for integrating materials management function over the logistics and supply chain operations.	<b>PO 1, 2, 4, 8,9,12</b>
<b>CO2</b>	Integrate the organization wide materials requirement to develop an overall plan (MRP).	<b>PO 2,3,4,8,7,8</b>
<b>CO3</b>	Identify, study, compare, and evaluate alternatives, select and relate with a good supplier.	<b>PO 3,4,6,8, 9, 12</b>
<b>CO4</b>	Apply various purchasing method and inventory controlling techniques into practice.	<b>PO 4,5,6,7,9,10,11</b>
<b>CO 5</b>	Analyzing the materials in storage, handling, packaging, shipping distributing and standardizing.	<b>PO 1,2,5,6,7,8,9</b>
<b>CO 6</b>	Integrate important materials functions to both products and services & use MRP,ERP,& PLM managing materials	<b>PO 1,2,3,7,8,9,10</b>

### Program Outcome / Course Outcome mapping

Course Outcomes	CO 1	CO 2	CO 3	CO 4	CO 5	CO 6
<b>PO 1</b>	3	3	3	2	2	1
<b>PO 2</b>	3	3	3	2	2	1
<b>PO 3</b>	3	3	3	2	2	1
<b>PO 4</b>	3	1	1	3	1	2
<b>PO 5</b>	2	2	1	3	1	2
<b>PO 6</b>	2	2	2	2	1	2
<b>PO 7</b>	3	3	1	2	1	2
<b>PO 8</b>	3	3	3	3	2	2
<b>PSO 9</b>	3	3	3	1	2	2


Students will demonstrate strong conceptual knowledge of management & its functional areas.
Students will demonstrate effective oral and written communication skills in the professional context.
Students will be able to work effectively in teams and demonstrate team-building capabilities.
Students will be able to evaluate the legal, social and economic environments of business.
Students will be able to describe the global environment of business.
Students will demonstrate sensitivity towards ethical and moral issues and have ability to address them in the course of business.
Students will be able to apply decision-support tools to business decision making.
Students will be able to apply knowledge of business concepts and functions in an integrated manner.
Students will demonstrate conceptual domain knowledge of the logistics sector.
Students will apply decision-support tools to decision making in logistics sector.
Students will apply conceptual knowledge of logistics sector in an integrated manner.
Students will demonstrate employable and deployable skills for appropriate roles in management.

<b>PSO 10</b>	3	3	3	2	2	2
<b>PSO 11</b>	3	3	3	2	2	1
<b>PSO 12</b>	1	1	1	3	2	1

LSC M 20 03	Materials Managem ent	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	P O 7	PO 8	PSO 9	PSO 10	PSO 11	PSO1 2
		3	3	3	2	2	2	2	3	2	3	3	2

- 1 – Weakly mapped  
2 – Moderately mapped  
3 – Strongly mapped

### Model Question Paper

<b>Name:</b> <b>Enrolment No:</b>			
<b>Course: LSCM 2003 – Materials Management</b>			
<b>Program: BBA (LM)</b> <b>Time: 03 Hrs.</b>	<b>Semester: II, 2016-17</b> <b>Max. Marks: 100</b>		
<b>Instructions:</b> Attempt all questions from <b>Section A</b> (each carrying 1 mark); any <b>Four Questions</b> from <b>Section B</b> (each carrying 5 marks); <b>Three Questions</b> from <b>Section C</b> (each carrying 10 marks). <b>Section D</b> is Compulsory (30 marks).			
<b>Section A (Answer <u>all</u> questions.)</b>			
1.	(i) The purchase of plant and machinery as capacity augmentation differs from routine purchase practices. [True / False]	[1]	CO-2
	(ii) Purchase of capacity elements of a factory is decided by : [Select the right answer(s)] a. Materials Manager b. Production Manager c. Finance Manager d. Engineering & Design Manager	[1]	CO-6
	(iii) The make or buy decision of capacity requirements largely depends on: [Select tight answer.] a. Negotiation time b. Source of availability c. Amount of investment d. All	[1]	CO-6
	(iv) Evaluation of capacity alternatives in the bidding process includes: [Select the right answer(s)]	[1]	CO-4

	a. Operation characteristics b. Engineering & Design characteristics c. Rate of obsolescence d. Economic analysis of investment		
(v)	Which of the following is not a method of economic analysis for investment into capacity building? [Select the right answer(s)] a. Payback period method b. ROI method c. IRR method d. None	[1]	CO-4
(vi)	A dedicated computer hardware and software system, known as _____ allows two companies conduct electronic transactions with each other. [Fill in the blank.]	[1]	CO-10
(vii)	Capital equipment is procured on lease basis due to: [write the right choice(s)] a. Short-period requirement b. Non-availability of fund c. Urgent requirement d. Procedural delay in releasing the fund	[1]	CO-6
(viii)	Any item that is carried in inventory is a _____. [Fill in the blank.]	[1]	CO-1
(ix)	An advantage of centralized purchasing departments in organizations is that they are very responsive to the needs of operations. [True / False]	[1]	CO-1,4
(x)	Distribution resource planning is the planning for the replenishment of regional warehouse inventories. [True / False]	[1]	CO-8
<i>Answer the following short questions with reference to the SAP MM module:</i>			
(xi)	_____ is a wider range of material type. [Fill in the blank]	[1]	CO-10
(xii)	When we create material master record every material is recognized by a number, that number will be unique and known as _____. [Fill in the blank]	[1]	CO-10
(xiii)	_____ is main source of material specific data in an enterprise. [Fill in the blank]	[1]	CO-10
(xiv)	The four types of procurement maintained in the purchase info record are – Standard, Subcontracting, pipeline and _____. [Fill in the blank]	[1]	CO-10
(xv)	_____ is the phase in which the material is received by the ordering party and the condition and quality are verified. [Fill in the blank]	[1]	CO-10
(xvi)	_____ is the formal and final confirmation of the requirements which is sent to vendor to supply material or services. [Fill in the blank]	[1]	CO-10
(xvii)	_____ is a reply by a vendor in response to RFQ. [Fill in the blank]	[1]	CO-10
(xviii)	Vendor database management is a module of MMIS. [True / False]	[1]	CO-10
(xix)	Can an MMIS use JIT approach to take a reordering decision when supplies' volume goes low? [No / Yes]	[1]	CO-10
(xx)	Sometimes, stock need to be blocked in advance so that it can be available at a particular point of time. This is known as _____. [Fill in the blank]	[1]	CO-10
<b>Section B</b> (Answer <u>any four</u> questions.)			
2.	(i) What are the primary and secondary objectives of materials management? List and explain.	[5]	CO-1
	(ii) Explain how 'make or buy' decisions are wisely done in materials planning stage.	[5]	CO-2,4,6
	(iii) Answer both parts of the question. a) Prepare the annual materials budget for the 'print and stationary shop' of UPES-Kandoli Campus. Mention the assumptions taken.	[5]	CO-2,3

	b) What is 'Bill of Materials'? Explain with an example, how it differs from the explosion chart.		
	(iv) Differentiate the perspective sourcing from mandatory sourcing.	[5]	CO-4,6
	(v) Explain the role of MMIS in fulfilling the basic and integrated objectives of materials management.	[5]	CO-10
<b>SECTION C (Answer <u>any three</u> questions.)</b>			
3.	(i) What are the functions of materials management? Explain in detailed.	[10]	CO-2
	(ii) Answer both parts of the question. a) Explain the thin-line differences between 'stockless inventory', 'zero inventory' and 'vendor managed inventory'. b) A manufacturer has to supply his customers 3600 units of products per year. Shortages are not permitted. Inventory carrying costs Rs. 1.20 per unit per annum. The ordering cost per order is Rs. 80. Find the following i. EOQ ii. Optimum no. of orders per annum iii. Average annual inventory cost (minimum) iv. Optimum period of supply per optimum order	[10]	CO-7
	(iii) What are the factors considered while locating a warehouse? Explain different techniques used for selecting a location.	[10]	CO-9
	(iv) Answer both parts of the question. a) Explain how supplier selection done through the stages of – sourcing, developing, and evaluating. b) The following information is available on 3 vendors: A, B and C. Using the data below, determine the best source of supply under weighed-point method and substantiate your solution. Vendor A: Delivered 56 lots; 3 were rejected; 2 were not according to the schedule. Vendor B: Supplied 38 lots; 2 were rejected; 3 were late. Vendor C: Finished 42 lots; 4 were defective; 5 were delayed deliveries. Given ratings are:           40 weights for quality   and   30 weights for service.	[10]	CO-4
<b>SECTION D is Compulsory</b>			
4.	Study the CASE and answer all the questions with proper logical analysis and justifications.  <b>CASE STUDY: VOLVO-SUNWIND</b>  Volvo is a Swedish multinational which manufactures cars and trucks. Sunwind is one of its suppliers, which supplies floor panels for the station wagon models of Volvo's 240 and 740 series of cars to Volvo's Torslanda plant in Sweden. Sunwind is a company of some 200 employees, and its product range consists of different interior fittings for the automobile and airplane industries. Volvo has been one of Sunwind's main customers since the start.  In the early 1950s, Volvo had severe problems with the quality of the floor panels in their station wagon model <i>Volvo Deuett</i> . One of the Volvo's employees knew two guitar craftsmen who had their workshop located in the vicinity of Volvo's Torslanda plant. These craftsmen were able to solve Volvo's problems with the help of a different milling technique and a couple of other process improvements. Volvo invited them to continue the relationship, and provided capital to the two entrepreneurs, who left the music business to join the automobile industry. Thus Sunwind was born.  At Sunwind's Save plant, some 100 km from Torslanda, the production rate is 2000 floor panels per week for the 740 series and 1000 for the 240 series. The assembly of panels is done in two assembly lines, one for each model. The panels are produced in eight different variants per line (two different covering materials in four colors). The role of Sunwind was like a subcontractor, as	[30]	CO-6 & Others

Volvo developed the prototypes and supplied the tools and raw materials to Sunwind. The completed floors were delivered to Volvo in different containers, each part in its own container. The product being bulky and color-dependent, a large storage space, both adjacent to the assembly line at Volvo as well as in Sunwind's own operations, was required. Volvo bought and collected the goods from the Save factory twice a week.

In order to gain cost benefit for both the parties, Volvo and Sunwind initiated JIT-like delivery schedule. The role of Sunwind has changed into being more of a partner than a subcontractor with an increased responsibility for the development and manufacture of their products to meet Volvo's specifications. The floors are now being delivered from Sunwind in sequence with the demand of the final assembly line of the Volvo and transported in custom-built containers in Sunwind's own trucks, which is unloaded less than 100 yards from the assembly point. Each container holds the complete set of floors for eight vehicles, stacked on one another in the same sequence as the vehicles that arrive at the assembly point in Torslanda, where the floors are assembled into the cars.

Every four weeks, a delivery schedule is made by Volvo, containing an estimate of the floor requirements of different colors, grades, etc. According to these forecasts, Sunwind orders their raw materials such as carpet materials and plywood, which are delivered to its plant in Hogsater some 200 km north of Save. Sunwind has reduced the number of suppliers and now relies up to a great extent on single sourcing. Due to economic reasons, the quantity bought at each shipment is the same – one truck load – but the mix of colors is pegged more accurately to the Volvo demand forecast. Volvo sends a specified order to Sunwind approximately ten days ahead of the production schedule. At Hogsater, work begins by milling out the plywood parts and cutting the covering materials to shape. Deliveries are made out of forecasts once a day to Sunwind's Save plant. By reducing set-up times, Sunwind had been able to transfer inventory backwards and, thus save on the inventory costs.

At Sunwind, the final assembly of floors does not take place until the complete delivery sequence is known, e.g., when a certain vehicle has passed through the paints works at Volvo, passed the subsequent quality controls, and reached the next assembly station. Each time a vehicle enters this point of the assembly line, a message is sent to the Save plant with a full assembly specification for the complete floor. The printer is actually standing in the assembly hall in Save and approximately once a minute an order is received. When assembly starts at Sunwind, the car in the Volvo plant in Torslanda is seven hours away from the assembly point where the floor will be installed into the car. The deliveries of the floor panels are made at the Torslanda plant four times a day. When the shipment arrives at the assembly building, it is only one hour until the first floor will be assembled into the car from the unloading dock, one container at a time is fetched by a forklift operator and delivered to the assembly point (Karlsson & Norr, 1994).

**Questions:**

- a. Volvo has another assembly plant in Kalmar at a distance of some 450 km from Sunwind's Save plant. Can Sunwind be used by Volvo to deliver floors to its Kalmar plant according to JIT schedules as it does for its Torslanda plant?
- b. Are these positive results due to Sunwind transferring the problems on hand to their own suppliers?
- c. Summarize the pros and cons of the JIT system from the point of view of Volvo and that of Sunwind.