

<b>LSCM 2005</b>	Warehouse Management	L	T	P	C
<b>Version 1.0</b>		3	0	0	3
<b>Pre-requisites/Exposure</b>	12 <sup>th</sup> level; Students should have basic concepts of logistics & supply chain				
<b>Co-requisites</b>	Students should have basic analytical, logical skills and hands on in Excel				

### Course Objectives

1. To understand how Warehouse Management and, other functions in logistics fits into Logistics & Supply Chain Management and how later fits into Business Process as an economic activity
2. What decisions – strategic, tactical and operations - and how they are taken in Warehouse Management area

**Course Outcomes:** On completion of this course, the students will be able to

- CO1. Understand the role of a warehouse in the supply side and in the consumption side.  
CO2. Understand the operations, performance measures and, standard operating procedures.  
CO3. Understand location, own-or-lease, and layout design of the warehouse.

### Catalog Description

This course will give exposure to the students of the rationale behind having warehouse in a supply chain and various other stopover points e.g. trans-shipment and cross-docking points. It will emphasize the operations decision making and, best practices in managing a warehouse and tactical decision making e.g standard operating processes. It will, briefly take the students through strategic decision making in Warehousing.

### Course Content

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#### Unit I:

**12 Hours**

#### **INTRODUCTION TO BUSINESS AND, LOGISTICS & SUPPLY CHAIN DECISION MAKING**

Business Organizations and Economic Value creation, Basic activity sets in Operations Management, Materials Management and Physical Distribution, Evolution of integration and Logistics Management and Supply Chain Management, Various perspectives of Logistics & Supply Chain, Management, Logistics & Supply Chain Activities Model, Customer Satisfaction Matrices

#### Unit II:

**12 Hours**

#### **BASIC SUPPLY CHAIN COMPONENTS AND THEIR COSTS AND CONFIGURATIONS**

Customer Satisfaction: Fill Rates and On-Time-Delivery, Inventory: Cost, ordering quantity and cycle decisions, and various ordering methods – JIT, VMI etc., Transportation: Costs and Configurations Warehousing: Cost of Owning and Outsourcing the facility

**Unit III: 12 Hours**

**WORLD CLASS WAREHOUSING PRACTICES**

• **BASIC WAREHOUSING DECISIONS - STRATEGIC**

Need, Basic Functions, Activity Triggers and Classification, Warehousing Decisions – Ownership Warehousing Decisions – Number, Warehousing Decisions – Location, Warehousing Decisions –Design

• **BASIC WAREHOUSE DECISIONS – TACTICAL**

Stock Verification, ABC, FSN Analysis; Identification of Obsolete Material

• **BASIC WAREHOUSE DECISIONS - OPERATIONAL**

Material Handling Equipment in Warehouse, Put away, Storing, Picking, Packing and Staging Activities

**Text Book**

1. Frazelle Edward H. “Supply Chain Strategy: The Logistics of Supply Chain Management”, Tata McGraw Hill (2009)

**Reference Books**

1. Ballou Ronald H., Srivastava Samir K. “Business Logistics/Supply Chain Management” Pearson, 5th Edition
2. Shah Janat “Supply Chain Management: Text and Cases” Pearson (2009)
3. Bowersox Donald D., Closs David J., Cooper Bixby M. “Supply Chain Logistics Management”, Tata McGraw Hill, 2nd Edition
4. Wisner Joel D., Keong Leong G., Tan Keach-Choon; 2005, Thompson Press
5. Coyle John J., Bardi Edward J., Langley John C.; 7th Edition; Thompson Press
6. Shapiro Jeremy F., 2nd Edition; Modeling The Supply Chain; Thompson Press

**Modes of Evaluation: Written Examinations (Mid Semester and End Semester), Internal Assessment (Assignment and Quiz)**

Components	Written Examination		Internal Assessment	
	Mid Semester	End Semester	Assignment	Quiz
Weightage (%)	20	50	15	15

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

<b>Mapping between COs and POs</b>
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	<b>Course Outcomes (COs)</b>	<b>Mapped Programme Outcomes</b>
<b>CO1</b>	Understand the role of a warehouse in the supply side and in the consumption side.	<b>PO 1, 2, 4, 8,9,12</b>
<b>CO2</b>	Understand the operations, performance measures and, standard operating procedures.	<b>PO 2,3,4,8,7,8</b>
<b>CO3</b>	Understand location, own-or-lease, and layout design of the warehouse.	<b>PO 3,4,6,8, 9, 12</b>

### **Program Outcome / Course Outcome mapping**

<b>Course Outcomes</b>	<b>CO 1</b>	<b>CO 2</b>	<b>CO 3</b>
<b>PO 1</b>	3	3	3
<b>PO 2</b>	3	3	3
<b>PO 3</b>	3	3	3
<b>PO 4</b>	3	1	1
<b>PO 5</b>	2	2	1
<b>PO 6</b>	2	2	2
<b>PO 7</b>	3	3	1
<b>PO 8</b>	3	3	3
<b>PSO 9</b>	3	3	3
<b>PSO 10</b>	3	3	3
<b>PSO 11</b>	3	3	3
<b>PSO 12</b>	1	1	1


		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.
LSC M 200 5	Warehouse Managem ent	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>P O 7</b>	<b>PO 8</b>	<b>PSO 9</b>	<b>PSO 10</b>	<b>PSO 11</b>	<b>PSO1 2</b>
		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>	
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<b>Course: LSCM 2005 Warehouse Management</b>	<b>Semester: IV Even-2015-18</b>
<b>Program: BBA (Logistics Management)</b>	<b>Max. Marks: 100</b>
<b>Time: 03 hrs.</b>	

**Instructions:**

**Note: All sections are compulsory & this question paper carries 4 sections.**

**Section A (20)**

**Attempt all questions in this section**

1.	<p>a. We do not need a warehouse; because ..... inventory is a cost. Therefore, ideally the ..... should be restricted to barest minimum viz., ..... i.e. warehouse-on-wheels between the production and consumption locations. (03/03)</p> <p>b. The demand made on a Warehouse Manager is to deliver ..... effectively in ..... , ..... and, with .....; also provide ..... services. (05/08)</p> <p>c. Factoring Rating is one of the methods of shortlisting candidate warehouse locations based on ..... criteria. In this exercise the ..... or, ..... on which a warehouse location need be finalized is and its ..... or ..... is gathered from industry experts. Then the candidate locations are ..... based on the ..... thus arrived and a weighted ..... is taken based on the weightage and a ..... or, ..... is prepared (10/18).</p> <p>d. .... is a mirror image of staging because in the former break-bulking is done and in the later ..... is done (02/20).</p> <p style="text-align: center;"><i>Please choose the word from below</i></p> <table style="width: 100%; border-collapse: collapse; margin-left: auto; margin-right: auto;"> <tr><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">factors</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">criteria</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">ranking</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">preference-list</td></tr> <tr><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">less-time</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">transit-days</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">value-added</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">storage-time</td></tr> <tr><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">qualitative</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">less-cost</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">less-errors</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">importance</td></tr> <tr><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">Idle</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">more-orders</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">criteria</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">consolidation</td></tr> <tr><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">rated</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">weightage</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">put-away</td><td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 2px;">average</td></tr> </table>	factors	criteria	ranking	preference-list	less-time	transit-days	value-added	storage-time	qualitative	less-cost	less-errors	importance	Idle	more-orders	criteria	consolidation	rated	weightage	put-away	average	(1*20=20 marks)	CO 1,2, 3,4
factors	criteria	ranking	preference-list																				
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Idle	more-orders	criteria	consolidation																				
rated	weightage	put-away	average																				

**SECTION B (40 Marks)**

**Attempt any 2 question, each question carries 20 marks only**

2. **Question # 02:** What are the basic Warehouse Operations, discuss (Marks 10)? What is Dock-to-Stock (Marks 2.5) and Warehouse Operations Cycle Time (Marks 2.5)? How does the former help reduce the later (Marks 2.5) and, what other practices in storage further reduce it (Marks 2.5)?

**Question # 03:** Your Company has Regional Warehouses in North, East, West and South India at New Delhi, Kolkata, Pune and Bangalore which cater to the respective markets. Hub-and-spoke method of distribution is envisaged now, and a proper city for the Nodal Warehouse is under discussion. You have been entrusted to come-up with the location for the proposed Nodal Warehouse based on Centroid or Center of Gravity method, which will be discussed further. You are aware of the market size in terms of metric-tons, given in the table below and, you have Googled Latitude and Longitude data in degrees, for the four cities, given alongside in the table. Also, you searched Google and obtained the length of the Equator and Meridional Circumference of the earth as 40,030 kms and 40,008 kms respectively. Calculate the Latitude and Longitude, in degrees, of the place where the proposed Nodal Warehouse should be located (Marks 20).

City	Market Size <small>in Lakh Metric-tons per annum</small>	Latitude <small>in Degrees</small>	Longitude <small>in Degrees</small>	City	Market Size <small>in Lakh Metric-tons per annum</small>	Latitude <small>in Degrees</small>	Longitude <small>in Degrees</small>
New Delhi	2,356	28.61	77.21	Pune	2,867	18.52	73.86
Kolkata	1,687	22.57	88.36	Bangalore	2,048	12.97	77.59

**Question # 04:** What is Centralized and De-centralized Distribution Networks (Marks 2.5)? What is risk pooling in terms of safety stock in the two modes of distribution systems (Marks 2.5). What is Square Root Law (SRL) (Marks 2.5) and what are the assumptions (Marks 2.5)?

Best Buys operates eight warehouses, each carries Rs. 2,500,000 of inventory on the average. The company wants to consolidate inventories into two warehouses. Assuming demands across the markets are negatively correlated; calculate the savings that the company would achieve (Marks 10)?

(20\*2=  
40  
marks)

CO  
2,  
3,4

**SECTION C(40 marks)  
(Compulsory question)**

5. **Question # 05:** Warehouse Performance is measured both in terms of its efficiency of operations and the effectiveness; they are Financial Measures, Productivity Measures, Cycle Time Measures and Quality Measures. Discuss the four measures and give examples (Marks 07x04<sup>Q</sup> = 28). Performance improvement planning begins with bench marking; discuss it (Marks 07) and, in this context explain Gap Analysis (Marks 05).

[40  
marks]

CO  
1, 2,  
3, 4