GUJARAT TECHNOLOGICAL UNIVERSITY

Programme: Master of Business Administration, 3rd Semester
Branch: Logistic & Supply Chain Management
Subject Name: Multi Model Transportation
Subject Code: 1539706

1. Learning Outcome:

Learning Outcome Component	Learning Outcome (Learner will be able to)
Business Environment and Domain Knowledge (BEDK)	Gain knowledge about logistics trade and transportation, multi-model transportation, containerization, transportation, planning, and cargo and container handling.
Critical thinking, Business Analysis, Problem Solving and Innovative Solutions (CBPI)	Examine the several options and approaches for multi-model transportation, and then select the best ones based on the needs of the company.
Global Exposure and Cross-Cultural Understanding (GECCU)	Analyze existing international business practices concerning multi-model transportation and determine how well these methods might be applied to solve organizational issues and decision-making needs.
Social Responsiveness and Ethics (SRE)	Assess the important ethical and administrative problems with multi-model transportation.
Effective Communication (EC)	Compile and effectively convey information about Multi-Model transportation in both oral and written forms.
Leadership and Teamwork (LT)	Collaborate as a team to develop a multi-model transportation strategy.

LO - PO Mapping: Correlation Levels:
1 = Slight (Low); 2 = Moderate (Medium); 3 = Substantial (High), "-"= no correlation

Sub. Code:	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
LO1: Gain knowledge about logistics trade and transportation, multi-model transportation, containerization, transportation, planning, and cargo and container handling.	3	3	2	-	-	-	-	-	2
LO2: Examine the several options and approaches for multi-model transportation, and then select the best ones based on the needs of the company	3	2	3	-	-	-	-	2	2
LO3: Analyze existing international business practices concerning multi-model transportation and determine how well these methods might be applied to	2	2	2	-	3	-	-	2	2

solve organizational issues and decision-making needs.									
LO4:Assess the important ethical and administrative problems with multi-model transportation	1	1	1	-	-	-	3	-	1
LO5: Compile and effectively convey information about Multi-Model transportation in both oral and written forms	1	1	1	3					1
LO6: Collaborate as a team to develop a multi-model transportation strategy.	2	2	2	-	-	3	-	1	1

2. Course Duration: The course duration is of **40 sessions of 60 minutes each.**

3. Course Contents:

Module No:	Contents	No. of Sessions	70 Marks (External Evaluation)
I	**MMT System** What is Multimodal Transport? – Uni-modal Transport - Intermodal Transport - Combined Transport, Aim of Multi Modal Transport, How to Organize Multimodal Transport, Terms of Reference for a National Multimodal Transport Committee (NMTC), Multimodal Transport in Practice today. **Containerization** Unit Load and Containerization, New Dimensions of Containerization – Handling - Economics of Scale - Evolution of Containerization, The Container Load Centre - through Transport - The Computer - Inland Operations – Competition, Transport System - Segmented Transport - Transport Logistics – Implications, Performance Measures for SCM	10	18
II	**Transportation, Logistics Trade and Transportation:** Objective, Introduction, Classification of Trade, Distribution Channels in Trade, The Role of Transportation in Trade, Organizational Arrangements Affecting Trade, Transportation Infrastructure, Design Areas for Transporters, Problems in Trade Transportation linkage **Transport Logistics:** Key Factors in Logistics, Classification of Logistics Applications, Warehousing, Decision Areas in Warehousing, Transportation,	10	18

	Packaging, materials Handling and Order Processing, Models in Logistics, Total Logistics Cost and the Value Added Concept		
III	**Transportation and Planning:** Transport Cost - Railways V/s Roadways - Railways V/s Inland Waterways - Inland Waterways V/s Roadways, Carriage of a 20ft Container by Road Vehicle - Quality of Service for Container Movement – Speed - Door-to Door Capability - Reliability and Security – Safety - Availability and Flexibility - Energy Efficiency **Container Carriage by Rail:** Objective, Introduction, Planning for the Railway Sector - Infrastructure Requirement for Container Carriage by Rail - Review of the Existing Infrastructure - Track Requirement, Investment in Rolling Stock - Container Stock - Special Container Cars - Problem of Tare Weight - Types of Container Wagons in use in India - New Stock of Low platform Container flat Wagons - Preparing for higher speed - Piggy Back Transport, Future Plan by Railway Authorities **Container Carriage by Road:** Objective, Introduction, Planning for the Road Sector - The Policy issues - Road Planning Procedures - Forecasting of future Transport, Standards - Number of lanes and width - Road Bridge - The lateral and Vertical clearance for overpasses and tunnels - Gradients and Horizontal Curvature - The Relationship of axle load and Payload capacity - Vehicle requirement for container carriage **Inland Waterways and Containerization:** Objective, Introduction, Planning for the Inland Waterways Sector, Infrastructure Requirements - Waterway Requirement - Minimum depth of Waterways - Minimum width of Waterways - Minimum vertical Clearance - Minimum width of turning area, Minimum equipment with Navigational aids, Vessel requirement, Terminal requirements, Inland Waterways in India - Progress under IWAI Act - Inland water Transport Policy - Interlinking waterways and ports	10	17
IV	**Cargo and Container Handling** **Packaging and Stowage of Cargo:** Objective, Introduction, Three Basic Functions of Packaging, Guidelines on the choice of Packaging, Type of Packaging for Break Bulk Cargo, Process of Marking and labeling,	10	17

	Standard shipping marks, Cargo handling instructions , shipping marks **Handling and transport of Dangerous Cargo:** Objective, What are dangerous goods?, Classification of dangerous goods , IATA dangerous goods regulations, Responsibilities of consignor and freight forwarder, Shippers declaration for transport of dangerous goods, Trained personnel., Right , Duties and Responsibilities for Carriage of Goods by Road, Rail , Sea and Air **Cargo Handling System:** Objective , Chassis System, Straddle Carrier System, Fork Lift Truck System, Transtainer System, Container Handling System, Quayside Gantry Cranes - Straddle Carriers - RTG Operation - RMG Operations - Terminal trailers - Lift Trucks		
V	**Practical:** ○ Choose a recent case study or news article focusing on unit load, containerization, and multimodal transport. Assess key components such as service quality, costs, and planning procedures across transportation modes. Evaluate cargo handling processes, including packaging, stowage, and management of dangerous goods. Discuss implications on supply chain management and logistics operations. Present findings in a structured report format with proper references and citations.	---	(30 marks CEC)

4. Pedagogy:

- ICT enabled Classroom teaching
- Case study
- Practical / live assignment
- Interactive class room discussions

5. Evaluation:

Students shall be evaluated on the following components:

A	**Internal Evaluation**	**(Internal Assessment- 50 Marks)**
	• Continuous Evaluation Component	30 marks
	• Class Presence & Participation	10 marks
	• Quiz	10 marks
B	**Mid-Semester examination**	**(Internal Assessment-30 Marks)**
C	**End –Semester Examination**	**(External Assessment-70 Marks)**

6. Reference Books:

No.	Author	Name of the Book	Publisher	Year of Publication / Edition
1	Dr. K. V. Hariharan	Containerisation, Multimodal Transport and Infrastructure Development in India	Shroff Publishers and Distributors Pvt. Ltd	5 edition (August 21, 2007)

2	Dr. K. V. Hariharan	A Textbook on Container & Multimodal Transport Management	Shroff Publishers and Distributors Pvt. Ltd,	Latest Edition
3	Dr. K. V. Hariharan	Laws Of Carriage Of Goods By Sea & Multimodal Transport In India	Shroff Publishers and Distributors Pvt. Ltd,	Latest Edition

Note: Wherever the standard books are not available for the topic appropriate print and online resources, journals and books published by different authors may be prescribed

7. List of Journals / Periodicals / Magazines / Newspapers / Web resources, etc.

1. International Journal of Logistics Management: Focuses on research articles related to containerization, multimodal transport, and logistics management issues.
2. Journal of Transport Geography: Covers topics such as transportation infrastructure, inter-modality, and planning for different modes of transport.
3. Supply Chain Management Review: Provides insights into supply chain logistics, container handling systems, and the integration of multimodal transport.
4. Maritime Economics & Logistics: Focuses on maritime transport issues, container carriage by sea, and containerization strategies in global trade.
5. Transportation Research Part A: Policy and Practice: Publishes research articles on transportation planning, mode selection, and intermodal transport challenges and solutions.