OPERATION AND SUPPLY CHAIN ANALYTICS

CREDITS :	3

OBJECTIVE:

➢ To treat the subject in depth by emphasizing on the advanced quantitative models and methods in logistics and supply chain management and its practical aspects and the latest developments in the field.

UNIT I   INTRODUCTION   9

Introduction to analytics – descriptive, predictive and prescriptive analytics, Data Driven Supply Chains – Basics, transforming supply chains, Barriers to implementation, Road Map.

UNIT II   WAREHOUSING DECISIONS   9

Mathematical Programming Models - P-Median Methods - Guided LP Approach - Balmer – Wolfe Method, Greedy Drop Heuristics, Dynamic Location Models, Space Determination and Layout Methods

UNIT III   INVENTORY MANAGEMENT   9

Inventory aggregation Models, Dynamic Lot sizing Methods, Multi-Echelon Inventory models, Aggregate Inventory system and LIMIT, Risk Analysis in Supply Chain - Measuring transit risks, supply risks, delivering risks, Risk pooling strategies.

UNIT IV   TRANSPORTATION NETWORK MODELS   9

Notion of Graphs, Minimal Spanning Tree, Shortest Path Algorithms, Maximal Flow Problems, Multistage Transshipment and Transportation Problems, Set covering and Set Partitioning Problems, Traveling Salesman Algorithms, Advanced Vehicle Routing Problem Heuristics, Scheduling Algorithms-Deficit function Approach and Linking Algorithms.

UNIT V   MCDMMODELS   9

Analytic Hierarchy Process(AHP), Data Envelopment Analysis (DEA), Fuzzy Logic and Techniques, the analytical network process (ANP), TOPSIS-Application in SCM

TOTAL: 45 PERIODS

OUTCOMES:

➢ Understanding of supply chain analytics fundamentals
➢ Ability to design warehouse models to enhance supply chain performance.
➢ Ability to analyse models and strategies in inventory management.
➢ Ability to understand network models in transportation.
➢ Ability to make decision using multi-criteria in applications of SCM

REFERENCES:

1. Nada R. Sanders, Big data driven supply chain management: A framework for implementing analytics and turning information into intelligence, Pearson Education, 2014.
2. Michael Watson, Sara Lewis, Peter Cacioppi, Jay Jayaraman, Supply Chain Network Design: Applying Optimization and Analytics to the Global Supply Chain, Pearson Education, 2013.
3. Anna Nagurney, Min Yu, Amir H. Masoumi, Ladimer S. Nagurney, Networks Against Time: Supply Chain Analytics for Perishable Products, Springer, 2013.
4. Muthu Mathirajan, Chandrasekharan Rajendran, Sowmyanarayanan Sadagopan, ArunachalamRavindran, ParasuramBalasubramanian, Analytics in Operations/Supply Chain Management , I.K. International Publishing House Pvt. Ltd., 2016.
5. Gerhard J. Plenert, Supply Chain Optimization through Segmentation and Analytics, CRC Press, Taylor & Francis Group, 2014.