

|                              |                                               |
|------------------------------|-----------------------------------------------|
| <b>Branch Name:</b>          | Management (Business Analytics)               |
| <b>Program Code:</b>         | MS301                                         |
| <b>Course Name:</b>          | Operation and Supply Chain Analytics          |
| <b>Course Code:</b>          | 2MS3010843T                                   |
| <b>Pre-requisite Course:</b> | Basics of production and operation management |

**Course Objectives:**

- 1) To provide foundational knowledge associated with the operations analytics
- 2) To provide foundational knowledge associated with the supply chain analytics
- 3) To describe the various tools and techniques for implementation of analytics based on the
- 4) supply chain drivers such as location, logistics and inventory
- 5) To describe the various techniques for analytics based on the Multi Attribute Decision Making (MADM) and risk
- 6) To provide the applications of analytics in operations and supply chain

**Teaching and Examination Scheme:**

| Teaching Scheme<br>(Hours per week) |                 |                  |        | Evaluation Scheme (Marks) |                          |                          |                          |                  |
|-------------------------------------|-----------------|------------------|--------|---------------------------|--------------------------|--------------------------|--------------------------|------------------|
| Lecture<br>(L)                      | Tutorial<br>(T) | Practical<br>(P) | Credit | Theory (Marks)            |                          | Practical (Marks)        |                          | Total<br>(Marks) |
|                                     |                 |                  |        | University<br>Assessment  | Continuous<br>Assessment | University<br>Assessment | Continuous<br>Assessment |                  |
| 4                                   | -               | -                | 4      | 60                        | 40                       | -                        | -                        | 100              |

**Subject Contents:**

| Sr No. | Topic                                                                                                                                                                                                                                                                                                                           | Total<br>Hours | Weightage<br>(%) |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------|
| 1      | <b>Warehousing Decisions</b><br>Warehousing Decisions, Mathematical Programming Models, P-Median Methods, Guided LP Approach, Balmer –Wolfe Method, Greedy Drop Heuristics, Dynamic Location Models, Space Determination and Layout Methods                                                                                     | 10             | 20               |
| 2      | <b>Inventory Management</b><br>Inventory Management, Inventory aggregation Models, Dynamic Lot sizing Methods, Multi-Echelon Inventory models, Aggregate Inventory system and LIMIT, Transportation Network Models, Notion of Graphs, Minimal Spanning Tree                                                                     | 10             | 20               |
| 3      | <b>Path Algorithms</b><br>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 | 10             | 20               |
| 4      | <b>Data Envelopment Analysis</b><br>Analytic Hierarchy Process, Data Envelopment Analysis, Risk Analysis in Supply Chain, Measuring transit risks, supply risks, delivering risks                                                                                                                                               | 10             | 20               |
| 5      | <b>Application in SCM</b><br>Risk pooling strategies, Fuzzy Logic and Techniques- Application in SCM                                                                                                                                                                                                                            | 08             | 20               |

**Text Books:**

| Sr. No. | Books                                                                                                                                                                            |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Khalid Zidan, Supply Chain Management: Fundamentals, Strategy, Analytics & Planning for Supply Chain & Logistics Management, Create Space Independent Publishing Platform, 2016. |
| 2       | Chan, Hing Kai, Subramanian, Nachiappan, Abdulrahman and Muhammad Dan-Asabe, Supply Chain Management in the Big Data Era, IGI Global. 2016                                       |

**Reference Books:**

| Sr. No. | Books                                                                                                                                                                                                           |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | Gerard Feigin, Supply Chain planning and analytics – The right product in the right place at the right time, Business Expert Press, 2011                                                                        |
| 2       | Robert Penn Burrows, Lora Cecere, Gregory P. Hackett, The Market-Driven Supply Chain: A Revolutionary Model for Sales and Operations Planning in the New On-Demand Economy, AMACOM Div American Mgmt Assn, 2001 |
| 3       | Peter Bolstorff, Robert G. Rosenbaum, Supply Chain Excellence: A Handbook for Dramatic Improvement Using the SCOR Model, AMACOM Div American Mgmt Assn, 2007                                                    |

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

| CLO  | Description                                                            | Bloom's Taxonomy Level |
|------|------------------------------------------------------------------------|------------------------|
| CLO1 | Understand and Apply Warehousing Decision Models                       | Understand             |
| CLO2 | Analyze Inventory Management and Optimization Techniques               | Analyse                |
| CLO3 | Solve Path and Routing Optimization Problems                           | Evaluate               |
| CLO4 | Perform Data Envelopment Analysis (DEA) for Efficiency Measurement     | Analyze                |
| CLO5 | Implement Advanced Supply Chain Risk Management Strategies             | Evaluate               |
| CLO6 | Use Analytics and Optimization Techniques in Supply Chain Applications | Apply                  |

**Mapping of CLOs with Pos & PSOs**

| Course Learning Outcomes | Program Outcomes (POs) |     |     |     |     |     |     |     | Program Specific Outcomes (PSOs) |      |
|--------------------------|------------------------|-----|-----|-----|-----|-----|-----|-----|----------------------------------|------|
|                          | PO1                    | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PSO1                             | PSO2 |
| CLO1                     | H                      | H   | H   |     |     |     |     |     | M                                | H    |
| CLO2                     | H                      | M   | M   |     |     |     |     |     | M                                | H    |
| CLO3                     | M                      | L   | M   |     |     |     |     | M   | H                                | L    |
| CLO4                     | L                      | M   | M   | H   |     |     |     | H   | M                                | M    |
| CLO5                     | M                      | M   | H   | L   | L   | L   | H   | M   | M                                | L    |
| CLO6                     | M                      | L   | L   | H   |     | H   | L   | M   | M                                | M    |

**H: High, M: Medium, L: Low**

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