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| **PROGRAM** | **Master of Business Administration (Business Analytics)** |
| **SEMESTER** | **IV** |
| **COURSE TITLE** | **Supply Chain Analytics** |
| **COURSE CODE** | **04MB0432** |
| **COURSE CREDITS** | **03** |
| **COURSE DURATION** | **42 Hrs (42 sessions of 60 minutes each)** |

**COURSE OUTCOMES:**

* Understand the use of Analytics in the applications of Supply Chain, Logistics and Material Management for Business Competitive Advantages.
* Master and apply the Core Methodologies used in Supply Chain Analysis and Modeling, including Statistics, Regression, Optimization and Probability.
* Use analytical tools like R, and MS Excel efficiently in order to take Managerial Decisions more Effectively
* Ability to Analyze and understand real problems in order to develop realistic models and understand the strengths and weaknesses of various modelling approaches.
* Be able to perform practical Quantitative Analysis related to Operations and Supply Chain Management.

**COURSE CONTENTS:**

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| Module No. | Unit/ Sub Unit | Sessions |
| I | **SC Analytics and Warehousing Decisions:** Defining Supply Chain Analytics, Importance of SCA, Basics of Metrics and KPIs, Warehousing Decisions: Layout Planning, Mathematical Programming Models, P-Median Methods, Guided LP Approach, Balmer – Wolfe Method, Greedy Drop Heuristics, Dynamic Location Models, Space Determination and Layout Methods  Big Box Retail example of Supply Chain Analytics  Purchasing model using Supply Chain Analytics | 8 |
| II | **Inventory Management and Materials Planning:** Inventory aggregation Models, Dynamic Lot sizing Methods [EOQ/EPQ], Multi-Echelon Inventory models, Aggregate Inventory system and LIMIT, Materials Management, MRP Systems and Extensions [MRP I and MRP II]  Operational Accounting example with SCA  Sales and Operational planning model of SCA | 10 |
| III | **Transportation Network Models:** Notion of Graphs, Minimal Spanning Tree, Shortest Path Algorithms, Maximal Flow Problems, Multistage Transhipment and Transportation Problems, Set covering and Set Partitioning Problems,  E-Commerce example in Supply Chain Analytics  Project Management example of SCA | 12 |
| IV | **Risk Analysis in Supply Chain and Applications:** Risk in Supply Chain, Measuring Transit Risks, Supply Risks, Delivering Risks, Risk Pooling Strategies. AHP in Supply Chain, Data Envelopment Analysis,  Example in Logistic models | 12 |
| V | Use of Third Party Logistics; Principle of Postponement, Beyond Supply Chain Optimization to Enterprise Optimization, Organizational Adaptation to Modelling Systems,Traveling Salesman Algorithms, Advanced Vehicle Routing Problem Heuristics, Scheduling Algorithms-Deficit Function Approach and Linking Algorithms  Reverse Supply Chain Analytics | CEC |

**EVALUATION:**

The students will be evaluated on a continuous basis and broadly follow the scheme given below:

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|  |  | Weight-age |
| A | Continuous Evaluation Component (Assignments / Quizzes /Class Participation etc.) | 20% (C.E.C.) |
| B | Internal Assessment | 30% (I.A.) |
| C | End-Semester Examination | 50%  (External Assessment) |

**SUGGESTED READINGS:**

**TEXT BOOKS:**

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| SNo | Author/s | Name of the book | Publisher | Edition and Year |
| T-01 | Gerard Blokdyk | Supply Chain Analytics: Beginner's Guide | Createspace Independent Pub | 2nd.edition,2017 |
| T-02 | Sunil Chopra and Peter Meindle | Supply chain management | Pearson Education Limited | 6th edition,2015 |
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**REFERENCE BOOKS:**

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| --- | --- | --- | --- | --- |
| SNo | Author/s | Name of the book | Publisher | Edition and Year |
| R-01 | D. Simchi-Levi, P. Kaminsky, E. Simchi-Levi, and Ravi Shankar | Designing and Managing the Supply Chain concepts, Strategies and Case studies | Tata McGraw Hill | 3rd Edition, 2008 |
| R-02 | G. Raghuram (I.I.M.A.) | Logics and Supply Chain Management | Macmillan | 2000 |
| R-03 | Jeremy F. Shapiro | Modeling the Supply Chain | Thomson Brooks/Cole | 2nd, edition, 2007 |