FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: **Bachelor of Technology (Mechanical Engineering)**

Semester: **VII**

Course Code: **202090705**

Course Title: **Supply Chain Operations and Analytics**

Course Group: **Professional Elective Course - III**

Course Objectives: This course intends to make students understand and appreciate the importance of Logistics and Supply Chain Operations in the industrial and business systems. Students will be able to understand processes of logistics, sourcing, current and world class supply chain management practices, supplier and customer relationship management practices. Students will also learn about different methods of evaluating performance of supply chain operations

Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
				Theory		J/V/P*		Total
Lecture	Tutorial	Practical		Internal	External	Internal	External	
3	0	2	4	50 / 18	50 / 17	25 / 9	25 / 9	150 / 53

* **J**: Jury; **V**: Viva; **P**: Practical

Detailed Syllabus:

Sr.	Contents	Hours
1	**Logistics and Supply Chain Management** Definitions of Logistics and Supply Chain Management, Evolution of Supply Chain Management, Objectives of SCM, Supply Chain network and flow of materials and information, Logistics and Distribution Channels, Different modes of transportation, Logistics Management Concepts – Total Logistical Cost V/s. Customer Service, Efficiency V/s. Responsiveness in SCM, Supply Chain Drivers/Enablers, SCM decision making – Strategic, Tactical and Operational.	3
2	**Supply Chain Dynamics and Alignment:** SCM alignment processes with customer order-management system, Supply chain integration through push-pull mechanism, Bullwhip effect: concept, causes and remedies, Network Design in Supply Chain, Network Optimization Models	5

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3	**Supply Chain Sourcing Practices:** Procurement, Purchasing, Sourcing, Make or Buy/Outsource Decisions, Buying decision – Grid Matrix, Strategic Sourcing, Strategic Purchasing Portfolio Analysis – Kraljic Model, Supplier Selection, Rating and Development, Elements of e-procurement system, Supplier Relationship Management (SRM)	**10**
4	**World-class best practices in SCM:** Supplier tierization, Reverse logistics, Vendor-managed inventory (VMI), Milk round system, Hub and spoke, Third and Fourth party logistics (3PL and 4PL), Cross docking, Drop shipping, Trans-shipment, Risk-pooling, Bar coding and RFID, Lean operations.	**5**
5	**Customer Relationship Management:** Concept of CRM and its linkage with SCM, Concept, practices and implications of techniques, such as Value Added Services and Strategic Pricing.	**3**
6	**Supply Chain Demand and Sales Planning:** Demand planning and forecasting, qualitative and quantitative techniques of forecasting, Collaborative planning, forecasting and replenishment, Aggregate planning, Sales and operations planning, Time Value of money in Supply Chain	**10**
7	**Supply Chain Performance Metrics:** Different types of Analytics in Supply Chain, Metrics for Supply Chain Performance Benchmarking, Agile supply Chain performance measures, Traditional and contemporary approaches of SCM performance measurement	**9**
8	**Total**	**45**

List of Practicals / Tutorials:

1	Exercise on supply chain network for different industries/business
2	Case analysis on Bullwhip effect
3	Exercise on supply chain network design and optimization
4	Exercise on buying decision – Grid Matrix for different industries/business
5	Exercise on strategic purchasing portfolio analysis – Kraljic Model for different industries/business
6	Exercise on supply chain demand forecasting methods
7	Case analysis on world-class best practices in SCM
8	Exercise on time value of money in supply chain operations
9	Case analysis on CRM for SCM of different industries/business
10	Case analysis on supply chain performance measurement for different industries/business

Reference Books:

1	Supply Chain Management- Concepts, Practices, and Implementation by Sunil Sharma, Oxford University Press
2	Supply Chain Management- Processes, System and Practice by N. Chandrasekaran, Oxford University Press
3	Supply Chain Management: Strategy, Planning and Operation, by Sunil Chopra and Peter Meindl, Prentice Hall of India
4	Designing and Managing the Supply Chain concepts, Strategies and Case studies, D. Simchi-Levi, P. Kaminsky, E. Simchi-Levi, and Ravi Shankar, TATA McGraw-Hill
5	Business Logistics/ Supply Chain Management by Ballou, Donald and Shrivastava, Person Education
	Manufacturing Planning & control for Supply Chain Management by Vollman, Berry, Whybark & Jacobs, TATA McGraw-Hill

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Supplementary learning Material:	
1	NPTEL resources
2	Coursera resources

Pedagogy:

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Industrial/ Field visits

Internal Evaluation:

The internal evaluation comprised of written exam (40% weightage) along with combination of various components such as Certification courses, Assignments, Mini Project, Simulation, Model making, Case study, Group activity, Seminar, Poster Presentation, Unit test, Quiz, Class Participation, Attendance, Achievements etc. where individual component weightage should not exceed 20%.

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks in %						**R**: Remembering; **U**: Understanding; **A**: Applying; **N**: Analyzing; **E**: Evaluating; **C**: Creating
R	**U**	**A**	**N**	**E**	**C**	
20%	20%	20%	20%	20%	0 %	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Appreciate the importance of logistics and supply chain management in overall success of any business/industrial sector.	**20**
CO-2	Appreciate the importance and dynamics of supply chain management in any business/industrial sector.	**20**
CO-3	Know the world class best practices being carried out in supply chain management	**15**
CO-4	Understand the sourcing, demand & sales planning, supplier selection and development process, pricing strategies and impact of customer relationship management in supply chain management.	**25**
CO-5	Understand and apply different analytics to measure the performance of supply chain operations.	**20**

Curriculum Revision:	
Version:	2
Drafted on (Month-Year):	June-2022
Last Reviewed on (Month-Year):	--
Next Review on (Month-Year):	June-2025

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