

**Name of the Programme: Executive MBA - Operations and Supply Chain
(1 Year)**

Program Objectives:

The program is designed to address the unique challenges and opportunities in today's dynamic business landscape. It aims to prepare industry leaders who can meet the specialized demands of critical sectors such as steel, power, coal and other essential industries. PM Gati Shakti NMP aims to accelerate the infrastructure development. Such a unique geospatial based platform necessitates the need of experts and professionals in the domain of logistics and supply chain management, who can take steps to digitize the operations with view to improve the logistics cost which is quite high at present. With the help of different tools and decision-making techniques including Artificial Intelligence (AI) and advanced analytics, the program not only seeks to enhance overall supply chain efficiency but also focuses on optimizing last mile delivery, a crucial aspect for various industries. Moreover, the program is tailored to attract participants from diverse sectors, fostering an environment where the principles of Gati Shakti NMP are applied strategically to drive innovation and sustainable growth.

Distinct Features of the program:

The program equips students with a strong grasp of operations and supply chain fundamentals for real-world problem-solving and makes them analytically sound as well as industrially groomed. It focuses on practical supply chain strategies aligned with organizational goals, fostering comprehensive expertise across transportation, inventory, warehousing, outsourcing, and procurement.

First Module:

In this module, students will acquire a diverse skill set essential for strategic decision-making in the business realm. Through Logistics and supply Chain Management, they will master the intricacies of supply chain optimization, procurement, and distribution, fostering operational efficiency. Financial Reporting and Accounting will equip them with the ability to analyze financial statements critically, ensuring a deep understanding of an organization's fiscal health. Marketing Management will hone their market analysis skills, enabling the development of effective marketing strategies rooted in consumer behaviour insights. Operations Management will provide tools to streamline processes and enhance productivity, while Operations Research will sharpen their quantitative problem-solving capabilities. Microeconomics for Managers will deepen their understanding of market dynamics, allowing them to make informed decisions considering economic factors. Ultimately, students will graduate with a holistic perspective, integrating financial acumen, strategic marketing expertise, operational efficiency, quantitative analysis, and economic insights, making them adept leaders capable of steering businesses in a dynamic and competitive landscape.

S.No.	Course	Credit
1	Logistics & Supply chain management	3
2	Financial Reporting and Accounting	3
3	Marketing Management	3
4	Operations Management	3
5	Operations Research	3
6	Microeconomics for Managers	3
		18 credits

Second Module:

In this module, students will gain expertise crucial for contemporary business leadership. Warehouse Management equips them with skills to optimize storage and distribution processes. Multimodal Transportation Systems offer insights into diverse transport modes, fostering global logistics proficiency. Innovation and Entrepreneurship encourage creative thinking and entrepreneurial skills development. Corporate Finance provides in-depth knowledge of financial strategies and investment decisions. Business Analytics hones data-driven decision-making, and Risk, Disruption, and Resilient Supply Chain management prepares them to navigate challenges, ensuring a comprehensive understanding of strategic supply chain resilience. Graduates will emerge prepared to drive innovation, manage finances, analyze data, and navigate complex supply chain landscapes with resilience and entrepreneurial acumen.

S.No.	Course	Credit
1	Warehouse Management	3
2	Multimodal Transportation Systems	3
3	Business Analytics	3
4	Innovation and Entrepreneurship	3
5	Corporate Finance	3
6	Risk, Disruption and Resilient Supply Chain	3
		18 credits

Third Module:

In this module, students will learn cutting-edge technologies and strategic applications. Business Applications of AI & ML Techniques equip them with practical skills, enabling the integration of artificial intelligence and machine learning into business strategies. Simulation Modelling and Supply Chain Digital Twin foster expertise in creating virtual models for supply chain optimization. The three elective courses empower students to specialize, choosing from a range of business-focused topics. Lastly, the Capstone Project synthesizes their learning, requiring them to apply their knowledge to solve real-world business challenges. Graduates will emerge with a deep understanding of AI, simulation modeling, specialized expertise, and practical problem-solving abilities, positioning them as adept professionals ready to drive innovation and strategic decision-making in diverse industries.

S.No.	Course	Credit
1	Business Applications of AI & ML Techniques	3
2	Simulation Modelling and Supply Chain Digital Twin	3
3	Elective – I	3
4	Elective – II	3
5	Elective – III	3
6	Capstone Project	3
		18 credits

List of Elective Courses

1. Simulation Modelling and Supply Chain Digital Twin
2. Mineral Supply Chain
3. Multimodal transportation systems
4. Risk resilience supply chain
5. Warehouse design management
6. Green Logistics
7. Managing people and organizations
8. Innovations in Waste Management
9. Management of Intellectual Property Rights (IPR) for Logistics
10. Digital Innovation and Technology in SCM
11. Procurement and Materials Management
12. Climate change and resilience
13. Logistics for Naya Bharat
14. Case studies of successful startups/Unicorns in Logistics
15. Case studies related to PM Gati Shakti NMP.

Detailed Course Outline for Core Courses

First Module

1. Subject: Logistics & Supply chain management

Content:

Introduction to Supply Chain Management & Case Analysis; Strategic Importance of IT & Computer Simulation in Supply Chain Management; Supply Chain Performance; Supply Chain System Slacks; Demand Management; Supply Management; Inventory Management; Production Management.

Introduction to Logistics, Logistics System Design, Logistics Channels, Concept of Inventory related to logistics, Transit inventory, Warehousing, Warehousing decision models, Transportation models, Volume flow, India's logistics transportation Sector and its challenges, Total logistics costs, Logistics metrics, Order Management, logistics information systems, Integration of all activities for effective supply chain performance, First and Last mile delivery.

Steel Supply Chain, Automotive Supply Chain, Energy Supply Chain, Electronics Supply Chain, Pharmaceutical Supply Chain, Fashion and Apparel Supply Chain, Retail Supply Chain and other important industries.

Text Books

Supply Chain Management: Strategy, Planning, and Operation (7th Edition), Sunil Chopra, Peter Meindl, Prentice Hall.

Integral Logistics Management: Operations and Supply Chain Management within and Across Companies, (4th Edition), Paul Schönsleben, CRC Press, Taylor & Francis Group.

Logistics & Supply Chain Management, (2022), Martin Christopher, Prentice Hall.

Business Logistics: Supply Chain Management (2007) L Ronald H. Ballou, Prentice Hall.

Introduction to Logistics Systems Management (2nd Edition): Gianpaolo Ghiani, Gilbert Laporte, Roberto Musmanno, Wiley.

Supply Chain and Logistics Management Made Easy: Methods and Applications for Planning, Operation, Integration, Control and Improvement, and Network Design (1st Edition): Paul A. Myerson, Pearson FT Press.

2. Subject: Finance and Accounting

Content:

Introduction to Balance Sheet, Introduction to Income Statement, Income Statement-Preparation, Balance Sheet- Preparation; Revenue Recognition, Issues in Revenue Recognition, Accounting for Inventory, Accounting for Depreciation, Accounting for Equity, Sources of Capital- Debt Accounting for Debt; Understanding of Annual Report, Understanding of Cash Flow Statement, Financial Statement Analysis.

Introduction: Basic concepts, scope of financial management, Time Value of Money:

Discounted Cash Flow valuation, Net Present Value: Meaning, Computation, Application in Business, Other Investment Rules: Discounted Pay Back, IRR, MIRR, Meaning, Computation, Applications

Making Capital Investment Decisions: Estimation of Cash Flows, Sunk Cost, Opportunity Cost, Depreciation, Effect of Inflation, Alternative Definitions of Operating Cash flow

Risk Analysis and Capital Budgeting: Sensitivity Analysis, Scenario Analysis, Break even analysis.

Capital Asset Pricing Model: Individual securities, expected returns, variance and covariance, diversification, CAPM, Risk, Cost of Capital and Valuation: Cost of Capital – Estimating the Cost of Equity – Risk Free Rate – Estimating Betas – Cost of Capital for Divisions and Projects – Cost of Debt – WACC. Capital Structure: Financial Leverage and Firm value, Modigliani and Miller Theory.

3. Subject: Operations Management

Content:

Introduction to Operations and Supply Management; Project Management; Manufacturing Processes and Facility Layout; Service Processes and Waiting Lines; Quality Management; Lean Manufacturing; Continuous Improvement; Integrated Business Planning (IBP): Demand Management and Forecasting; Aggregate Sales and Operational Planning; Inventory Control; Material Requirements Planning; Scheduling; Case Studies and Practical Applications.

Text Books

Operations & Supply Management, (14th Edition), Chase, R. B. Aquilano, N. J. Jacobs, F. R. Boston, McGraw-Hill.

Operations Management: Processes and Supply Chains, (12th Edition), Krajewski, L.J., Ritzman, L. P. and Malhorta, M.J., Pearson.

Operations Management, (12th Edition), Heizer, Jay; Render, Barry, Upper Saddle River, N.J.: Prentice-Hall.

Operations Management, (13th Edition), William J. Stevenson, Tata McGraw Hill education Private Limited.

4. Subject: Operations Research

Content:

Introduction to Operations Research (OR), Formulation of real-life decision-making problems as linear programming problems, Graphical Method, Simplex Method, Sensitivity Analysis & Duality; Transportation, Assignment and Transshipment Problems and its applications, Queuing Theory, Simulation, Decision Making under Risk & Uncertainty, Game Theory.

Text books:

Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2018). An introduction to management science: quantitative approach. Cengage learning.

Winston, W. L. (2003). Operations research: applications and algorithms. Belmont: Thomson Brooks/Cole.

Hillier F.S. and Liebermann G.J. (2002). Introduction to Operations Research, McGraw Hill.

Taha, Hamdy A. Operations research: an introduction. Pearson Education India, 2013.

5. Subject: Marketing Management

Content:

Introduction to Marketing: Defining Marketing for the New Realities; Developing Marketing Strategies and Plans; Capturing Marketing Insights: Collecting Information and Forecasting Demand; Conducting Marketing Research; Connecting with Customers: Analyzing Consumer Markets; Analyzing Business Markets; Building Strong Brands: Identifying Market Segments and Targets; Crafting the Brand Positioning; Shaping the Market Offerings: Designing and Managing Services; Developing Pricing Strategies and Programs; Delivering Value: Designing and Managing Integrated Marketing Channels; Managing Retailing, Wholesaling, and Logistics; Communicating Value: Designing and Managing Integrated Marketing Communications; Managing Digital Communications: Online, Social Media and Mobile Marketing; Emerging areas in Marketing

Text books:

Kotler, Philip and Keller, K. L. Marketing Management, 15th Edition.

6. Subject: Microeconomics for Managers

Content:

Managerial economics including theory of the firm, analysis of consumer behaviour, market forces of demand and supply, theory of production and costs, price and output determination under different types of markets and market failure and role of government in the economy.

Text books:

Dominick Salvatore and Siddhartha K. Rastogi, Managerial Economics, Principles & Worldwide Applications, 9th edition, Oxford University Press 2020

Robert S Pindyck, Daniel L Rubinfeld and Prem L Mehta, Microeconomics 8th Edition, Pearson 2017.

Paul G. Keat, Philip K Y Young, Stephen E Erfle and Sreejata Banarjee, Managerial Economics: Economic Tools for Today's Decision Makers, 7th Edition, Pearson, 2018.

Thomas and Maurice, 2010, Managerial Economics, McGraw Hill

Gupta G. S., Managerial Economics, McGraw Hill

Second Module

1. Subject: Warehouse Management

Content:

Concept of warehouse, role of warehouse in supply chain, types of warehouse, functions of warehouse, warehouse location, warehouse layouts, warehouse operations, Receiving and

Putaway, Pallet storage and handling systems, Case picking systems, equipment used in warehouse, storage & retrieval systems, warehouse automation, Handling, Storage and Retrieval Process including Kitting and packaging, Latest Technologies in Warehouse Management - Robotics, AGV, Sorters, Pick to Light and Put to Light systems, warehouse management system, safety and insurance issues in warehouse, warehouse cost management, warehouse performance management and improvement, warehouse design, seven principles of world-class warehousing, use of ICT in warehouse management, warehouse workforce design and development, warehouse maintenance, world-class practices in warehouse management.

Text Books

Edward H. Frazelle, World-Class Warehousing and Material Handling, McGraw-Hill Publishers. ISBN: 978-0-07-178559-4.

Gwynne Richards, Warehouse Management: A complete guide to improving efficiency and minimizing costs in the modern warehouses, Kogan Page Ltd, New Delhi. ISBN:978-0-7494-6934-4.

2. Subject: Multimodal Transportation System

Content:

Concept of Multi Modal Transport, Components of Multi Modal Transportation System, Benefits of Multi Modal Transport, Multi Modal Transport Operator, Responsibilities and Liabilities of the Multi Modal Transport Operator, Challenges of Multi Modal Transport System, Multi Modal Transport Technology. Multi Modal Transport Documents. Difference between Multimodal and Intermodal transport.

Various Modes of Transport. Intermodal systems – road/rail/sea; sea/air; road/air; road/rail, sea/rail, sea/road, Canals/Inland waterways. Inland Container Depot (ICD). Container Freight Station (CFS) Terminals, Roll-on/Roll-Off Service, Development of multi modal transport system in Indian - Metro Rails, Light Rail Transit (LRT), Sub-Urban Trains, Ring Rail and Monorails, Bus Rapid Transit Systems, Bullet Trains. City Transport. Inland Waterways, Economic corridors, Containerization, Non-containerization cargo, dry ports, pipelines, palletization, Channel tunnel.

Multimodal Transport of Goods Act-1993, Private Freight Terminals (PFT) Policy, Draft Coastal Shipping Policy, Cabotage Policy, Policy to permit Operators to move container trains on Indian Railways, Foreign Direct Investment Regulatory Reforms.

Text Books

Sinha, Deepankar, ed. "Global Supply Chains and Multimodal Logistics: Emerging Research and Opportunities: Emerging Research and Opportunities." (2019).

Logistics & Supply Chain Management, (2022), Martin Christopher, Prentice Hall.

Business Logistics: Supply Chain Management (2007) L Ronald H. Ballou, Prentice Hall.

Introduction to Logistics Systems Management (2nd Edition): Gianpaolo Ghiani, Gilbert Laporte, Roberto Musmanno, Wiley.

Supply Chain and Logistics Management Made Easy: Methods and Applications for Planning, Operation, Integration, Control and Improvement, and Network Design (1st

Edition): Paul A. Myerson, Pearson FT Press.

Coyle J.J, Bardi E.W., Langley C.J., The Management of Business logistics, A Supply Chain Perspective (2022), Thomson Asia.

3. Business Analytics

Content:

Python for data science: Introduction to programming and why Python? Overview of Jupyter Instance, Data types in python, functional programming, Useful libraries for data science like NumPy, Pandas, SK-Learn, matplotlib, seaborn and others.

Optimization algorithms, what is optimization and need for optimization in data science, How to develop mathematical formulations for business problems, Linear, Non-Linear Programming problem, Applications to business and economics.

Types of Data, Scales of measurements, Descriptive Statistics, Measures of Central Tendency, Measures of Variability, Random Variable, Probability and laws of Probability, Conditional and Joint Probability, Bayes Theorem, Discrete and Continuous Probability Distributions, Sampling Techniques, Central limit theorem, Point and Interval Estimation, Testing of hypothesis, Type I and Type II errors, Inferences, Regression Analysis.

Text Books

Kumar, U. Dinesh. Business analytics: The science of data-driven decision making. Wiley, 2017.

Levin, Richard I., and David S. Rubin. Statistics for management. Prentice Hall, 2017.

Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2018). Statistics for Business & Economics. Cengage learning.

Hastie, T., Tibshirani, R., Friedman, J. H., & Friedman, J. H. (2009). The elements of statistical learning: data mining, inference, and prediction (Vol. 2, pp. 1-758). New York: springer.

Provost, F., & Fawcett, T. (2013). Data Science for Business: What you need to know about data mining and data-analytic thinking. O'Reilly Media, Inc.

Géron, Aurélien. Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow. " O'Reilly Media, Inc.", 2022.

4. Subject: Innovation and Entrepreneurship

Content:

Understanding Entrepreneurial Learning - Effectuation – Design Thinking – Value Stream Analysis Learning by a start-up experiment Understanding Start-up – Small Business – Entrepreneurship – Student start-up, Student academic labour and start-up - MOE / AICTE Student start-up policy– Objectives, design and strategy of a student start-up. The Lean start-up – VISION – Start, define, lean, experiment STEER –Leap, test, measure, Pivot ACCELERATE – Batch, Grow, Adapt, Innovate Registering a start-up – Business Model development – Customer development.

Text Books

Eric Ries (2011). *The Lean Startup* London, Portfolio / Penguin
Lackeus, M (2015). *Entrepreneurship in Education*, OECD Report

5. Subject: Corporate Finance

Content:

Introduction: Basic concepts, scope of financial management, relevance to the course, expected deliverables

Time Value of Money: Discounted Cash Flow valuation, Net Present Value: Meaning, Computation, Application in Business, Other Investment Rules: Discounted Pay Back, IRR, MIRR, Meaning, Computation, Applications

Making Capital Investment Decisions: Estimation of Cash Flows, Sunk Cost, Opportunity Cost, Depreciation, Effect of Inflation, Alternative Definitions of Operating Cash flow

Risk Analysis and Capital Budgeting: Sensitivity Analysis, Scenario Analysis, Break even analysis. , Interest Rates and Bond Valuation: Bonds and Bond valuation, Government and Corporate Bonds, Stock Valuation: Present value of common stocks, Dividend discount model, valuing the entire firm

Capital Asset Pricing Model: Individual securities, expected returns, variance and covariance, diversification, CAPM, Risk , Cost of Capital and Valuation: Cost of Capital – Estimating the Cost of Equity – Risk Free Rate – Estimating Betas – Cost of Capital for Divisions and Projects – Cost of Debt – WACC. , Capital Structure: Financial Leverage and Firm value, Modigliani and Miller Theory

Text Books

Ross, Stephen A., Randolph Westerfield, and Jeffrey F. Jaffe. *Corporate finance*. McGraw-Hill, 2021.

6. Subject: Risk, Disruption and Resilient Supply Chain

Content:

Introduction to supply chain risk and disruption, Risk management in Supply Chain, Business continuity management (BRM), Supply Chain Resilience: Design & Management, Resilience modeling in Supply Chain, Measuring Supply Chain Resilience, Strategies for mitigating operational and disruption risks, Supply Chain Viability.

Text books:

Designing and Managing the Supply Chain: Concepts, Strategies and Case studies (4th Edition) by David Simchi Levi, Edith Simchi Levi, Ravi Shankar, Philip Kaminsky. McGraw Hill Education. Copyright © 2022

Introduction to supply chain resilience: Management, modelling, technology, by Dmitry Ivanov. Springer Nature, 2021.

Cachon, Gerard, and Christian Terwiesch. *Matching supply with demand*. McGraw-Hill Publishing, 2018.

Third Module

1. Subject: Business Applications of AI & ML Techniques

Content:

Artificial Intelligence and Problem Solving; Supervised Learning: Regression Algorithms; Linear Regression, Decision Trees Regression, Random Forests Regression, Gradient Boosting Machines (Light GBM and XG Boost), Comparison of regression algorithms – Right choice of algorithms, Model evaluation metrics and Bias-Variance trade-off, Regularization techniques, Additional techniques on improving the accuracies in challenging scenarios with smart feature engineering and modelling methodologies; Supervised Learning: Classification Algorithms; Logistic Regression, Decision Trees classification, Random Forest classification, Gradient Boosting Machines, Support Vector Machines, Artificial neural networks, back propagation, introduction to Deep Learning, Comparison of classification of algorithms – Right choice of algorithms; Unsupervised Learning: Clustering Algorithms: Strategic preparation of data for clustering, K-Means, hierarchical clustering, agglomerative clustering algorithms, Evaluation metrics and right choice based on the business need, Predicting the similarity and differences between the clusters

Text Books

Kumar, U. Dinesh. Business analytics: The science of data-driven decision making. Wiley, 2017.

Kelleher, John D., Brian Mac Namee, and Aoife D'arcy. Fundamentals of machine learning for predictive data analytics: algorithms, worked examples, and case studies. MIT press, 2020.

Stuart Russell and Peter Norvig. (2015). Artificial Intelligence: A Modern Approach, 3rd edition, Pearson Education.

George Luger (2017). Artificial Intelligence: Structures and Strategies for Complex Problem solving, 6th edition, Pearson Education.

Shai Shalev-Shwartz and Shai Ben-David (2014). Understanding Machine Learning: From Theory to Algorithms, Cambridge University Press.

Giuseppe Bonaccorso (2017). Machine Learning Algorithms, Packt Publishing.

Géron, Aurélien. Hands-on machine learning with Scikit-Learn, Keras, and TensorFlow. " O'Reilly Media, Inc.", 2022.

2. Subject: Simulation Modelling and Supply Chain Digital Twin

Content:

Introduction to System and simulation, Review of probability, Principles of modeling and simulation, Monte- Carlo simulation, Discrete event simulation, Steps in simulation, Random numbers generation, Test for random numbers, Random variate, Design of simulation experiment: analysis of input data, output data, Validation and verification etc., Overview of simulation languages, Modeling and analysis of manufacturing systems and simulation experiments.

Introduction to Supply Chain Optimization and Simulation, Introduction to Digital Supply Chain Twins, Supply chain network design using simulation software, Supply chain simulation

using simulation software, Supply chain resilience and its modelling using simulation software, Supply chain resilience analysis using simulation software, Future trends.

Text Books

Jerry Banks, John S. Carson, Barry L. Nelson, David M. Nicol, and P. Shahabudeen, Discrete Event System Simulation, Prentice Hall of India, New Delhi, 2008.

Averill M. Law and W. David Kelton, Simulation Modeling and Analysis, Tata McGraw Hill, New Delhi, 2006.

MacCarthy, Bart L., and Dmitry Ivanov, eds. The digital supply chain. Elsevier, 2022.

Detailed Course Outline for Elective Courses

1. Subject: Maritime Logistics

Content:

Importance of maritime logistics in global trade, the structure of the maritime industry: vessel types, shipping lines, policies, and regulatory mechanism, types of port terminal operations, and the role of Industry 4.0 technologies in maritime logistics, demand, and inventory management in maritime logistics, modeling risk disruption, and resilience in maritime industry, sustainability issues in maritime logistics.

Textbooks

Maritime Logistics: A Guide to Contemporary Shipping and Port Management (2015) by Dong-Wook Song and Photis M. Panayides.

Maritime Logistics: Contemporary Issues (2012) by Dong-Wook Song and Photis Panayides
Sinha, D. (Ed.). (2019). Global Supply Chains and Multimodal Logistics: Emerging Research and Opportunities: Emerging Research and Opportunities.

2. Subject: Airport Logistics

Content:

Role of Air Transportation in Global Business Strategies; Integration of Air Logistics in Supply Chain Management; Strategic Alliances and Partnerships in Airfreight; Regulatory Challenges and Compliance in Air Logistics; Pricing Models and Revenue Management in Air Logistics; Risk Management Strategies in Airfreight; Air Cargo Handling and Packaging; Technology and Data Analytics in Air Logistics; Real-world Air Logistics Cases; E-commerce and Air Logistics: Trends and Challenges; Urban Air Mobility and the Future of Last-Mile Delivery.

Textbooks

Sales, M., & Scholte, S. (2023). Air cargo management: Air freight and the global supply chain. Taylor & Francis.

Maniriho, E. A. (2022). Aviation, AirCargo and Logistics Management: A Manual for Air Cargo Handlers and Shippers. Notion Press.

Hoffmann, R. (2014). Dynamic capacity control in air cargo revenue management. KIT Scientific Publishing.

Sinha, D. (Ed.). (2019). Global Supply Chains and Multimodal Logistics: Emerging Research and Opportunities: Emerging Research and Opportunities.

3. Subject: Road and Railway Logistics

Content:

Strategic Importance of Road and Railway Logistics; Road and Railway Transportation Economics; Intermodal Transportation: Integrating Road, Rail, and Other Modes; Route Optimization and Network Design in Logistics; Risk Management and Security in Road and

Railway Transportation; Sustainable Practices and Environmental Responsibility in Logistics; Technology and Innovation in Road and Railway Logistics; Real-world Road and Railway Logistics Cases; Last-Mile Delivery Solutions and Urban Logistics; High-Speed Rail and Future of Railway Transportation.

Textbooks

Coyle, J. J., Novack, R. A., Gibson, B. J., & Bardi, E. J. (2016). *Transportation: a supply chain perspective*. South-Western Cengage Learning.

Pyrgidis, C. N. (2021). *Railway transportation systems: design, construction and operation*. CRC press.

Sinha, D. (Ed.). (2019). *Global Supply Chains and Multimodal Logistics: Emerging Research and Opportunities: Emerging Research and Opportunities*.

4. Subject: Advanced AI for Supply chain and Logistics

Content:

Overview of Supply Chain Management (SCM) and Logistics; Challenges and Opportunities in Supply Chain Optimization; Case Studies: Real-world Applications of AI in SCM; Introduction to AI, ML, and Deep Learning; Supervised and Unsupervised Learning; Time Series Forecasting; Anomaly Detection in Supply Chain Data; Recommender Systems for Demand Forecasting; Ensemble Learning and Model Stacking; Introduction to Neural Networks and Deep Learning; Recurrent Neural Networks (RNNs); Convolutional Neural Networks (CNNs) for Image-Based Logistics; Sequence-to-Sequence Models for Demand Forecasting; Introduction to Reinforcement Learning (RL); Q-Learning and Deep Q Networks (DQN) for Inventory Management; Applications of RL; Introduction to NLP; Text Mining for Supplier and Customer Sentiment Analysis; Chatbots and Virtual Assistants for Customer Support.

Text Books

Tipi, N. (2021). *Supply chain analytics and modelling: Quantitative tools and applications*. Kogan Page Publishers.

Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E., & Shankar, R. (2008). *Designing and managing the supply chain: concepts, strategies and case studies*. Tata McGraw-Hill Education.

Shapiro, J. F. (2001). *Modeling the supply chain*. Duxbury Resource Center.

Watson, Michael. *Supply chain network design: applying optimization and analytics to the global supply chain*. Pearson education, 2013.

Liu, Kurt Y. *Supply Chain Analytics: Concepts, Techniques and Applications*. Palgrave Macmillan, 2022.

Srinivasan, G. *Quantitative models in operations and supply chain management*. PHI Learning Pvt. Ltd., 2017.

5. Subject: Advanced Supply Chain Analytics

Content:

Introduction to Supply chain Analytics, Descriptive, Predictive and Prescriptive analytics, Controlling the Bullwhip and the Value of Information, Supply Chain Integration, Push-Pull and Complexity Reduction, Supply Chain Segmentation, Using Big Data to improve Performance of Supply Chain, Supply Chain Resiliency, Supply Chain Flexibility, Inventory Management and Risk Pooling Strategies, Supply Contracts and Risk Sharing Strategies, Network Planning, Demand and Supply Analytics.

Transportation decisions: *Multistage transportation problems, fixed charge transportation problem (FCPP): heuristic solution to FCPP, multiple items and fixed charge, heuristic solution for multiple items*, Truck allocation problem: *integer programming formulation, branch and bound algorithm*, Point to point transportation- multiple customers to a single vehicle: *formulation, heuristic algorithms*, Location and network design models: *important factors in location decisions, models for discrete space location problems, model for continuous space location problems*, Multi-echelon and single product location allocation models, Facilities layout: *Computerized algorithm for layout CRAFT*.

Text Books

Tipi, N. (2021). Supply chain analytics and modelling: Quantitative tools and applications. Kogan Page Publishers.

Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E., & Shankar, R. (2008). Designing and managing the supply chain: concepts, strategies and case studies. Tata McGraw-Hill Education.

Shapiro, J. F. (2001). Modeling the supply chain. Duxbury Resource Center.

Watson, Michael. Supply chain network design: applying optimization and analytics to the global supply chain. Pearson education, 2013.

Liu, Kurt Y. Supply Chain Analytics: Concepts, Techniques and Applications. Palgrave Macmillan, 2022.

Srinivasan, G. Quantitative models in operations and supply chain management. PHI Learning Pvt. Ltd., 2017.

6. Subject: Advanced Operations Research

Content:

Introduction to Advanced Operations Research; Problem Formulation and Model Building Techniques; Introduction to Nonlinear Programming and Convex Optimization; Duality and Sensitivity Analysis; Integer Linear Programming and Mixed-Integer Linear Programming (MILP); Network Optimization: Shortest Path, Max Flow, and Assignment Problems; Unconstrained Optimization: Gradient Descent, Newton's Method; Constrained Optimization: Lagrange Multipliers, KKT Conditions; Convex Optimization: Properties, Algorithms, and Applications; Introduction to Stochastic Processes; Stochastic Programming: Two-Stage and Multi-Stage Problems; Markov Decision Processes and Reinforcement Learning; Multi-Objective Optimization; Pareto Optimality and Efficiency; Goal Programming; Evolutionary Algorithms for Multi-Objective Optimization; Introduction to Game Theory; Cooperative and Non-Cooperative Games; Applications of Game Theory in Supply Chain; Monte Carlo Simulation; Discrete-Event Simulation for Complex Systems.

Text Books

Anderson, D. R., Sweeney, D. J., Williams, T. A., Camm, J. D., & Cochran, J. J. (2018).

An introduction to management science: quantitative approach. Cengage learning. Winston, W. L. (2003). Operations research: applications and algorithms. Belmont: Thomson Brooks/Cole.

Hillier F.S. and Liebermann G.J. (2002). Introduction to Operations Research, McGraw Hill.

Taha, Hamdy A. Operations research: an introduction. Pearson Education India, 9th edition.

7. Subject: Retail and e-commerce Supply Chain Management

Content:

Overview of Retail and E-commerce Supply Chain Landscape; Key Differences Between Traditional Retail and E-commerce Supply Chains; Facility Location and Layout Planning; Network Design for Omnichannel Operations; Vendor Selection and Management; Sustainability and Green Supply Chain Practices in Retail; Facility Location and Layout Planning; Network Design for Omnichannel Operations; Vendor Selection and Management; Sustainability and Green Supply Chain Practices in Retail; Inventory Models; Demand Forecasting Techniques: Time Series Analysis, Machine Learning; Inventory Optimization in E-commerce: JIT, Drop-shipping, Cross-docking; Order Processing and Fulfillment Strategies; Warehousing and Distribution Center Management; Last-Mile Delivery Challenges and Solutions; Robotics and Automation in Order Fulfillment; Role of Big Data and Predictive Analytics in Retail; IoT and RFID Applications in Supply Chain Visibility; Blockchain Technology for Supply Chain Transparency; E-commerce Platforms and Payment Systems; Customer Experience and Returns Management; Regulatory Compliance and Ethical Considerations.

Text Books

Agrawal, Narendra, and Stephen A. Smith. *Retail supply chain management*. Springer, 2015.

Schniederjans, M. J., Cao, Q., & Triche, J. H. (2013). *E-commerce operations management*. World Scientific Publishing Company.

8. Subject: Modern-day SCM for E-commerce in India

Content:

Overview of Indian E-commerce Market: Trends and Growth; Regulatory Environment and E-commerce Policies in India; Market Players: From Startups to Established Players; Consumer Behavior and Cultural Influences; Supply Chain Design for Indian E-commerce: Network Optimization for Indian Geography; Vendor Management and Negotiation in Indian Context; Warehousing Strategies: Centralized vs. Decentralized; Sustainable Supply Chain Practices: Green Warehousing and Packaging; Demand Forecasting Techniques for Diverse Indian Markets; Inventory Optimization: Balancing Storage Costs and Demand Variability; Seasonal Demand Management: Festivals and Special Events in India; JIT Inventory Systems for Lean E-commerce Operations; Selection and Management of Logistics Partners; Challenges in

Urban and Rural Last-Mile Delivery; Technology Integration in Logistics: GPS, IoT, and Real-time Tracking; Crowdsourced Delivery Models and Hyperlocal Logistics; Mobile Commerce; AI and Machine Learning Applications; E-commerce Platforms and Payment Gateways in India; Case Studies and Industry Practices.

Text Books

Joseph, Pulitarambil Thomas. *E-commerce: An Indian perspective*. PHI Learning Pvt. Ltd., 2023.

Laudon, Kenneth C., and Carol Guercio Traver. *E-commerce 2019: Business, technology, society*. Pearson, 2020.

Varma, Anil, and Samrat Ray. "The case of amazon's E-commerce digital strategy in India." (2023).

9. Green Logistics

Content:

Introduction to Green Logistics; Green Supply Chain Strategies: From Procurement to Distribution; Life Cycle Assessment (LCA) in Supply Chain Design; Eco-design and Sustainable Packaging; Supplier Evaluation and Sustainability Criteria; Sustainable Transportation Modes: Rail, Maritime, and Green Shipping; Electric and Hybrid Vehicles: The Future of Green Transportation; Last-Mile Delivery Solutions: Bicycles, Drones, and Electric Vehicles; Urban Logistics and Low Emission Zones; Reverse Logistics and Product Returns; Waste Reduction Techniques: Reuse, Repair, and Remanufacturing; Recycling and Waste-to-Energy Solutions; E-waste Management and Responsible Disposal; Renewable Energy Sources: Solar, Wind, and Biomass; Energy-efficient Warehousing and Distribution Centers; Smart Technologies: IoT and Sensors in Energy Management; Green IT: Sustainable Practices in Information Technology; Circular Economy and Sustainable Practices; Case Studies: Successful Green Logistics Initiatives.

Text Books

Grant, D. B., Trautrim, A., & Wong, C. Y. (2013). *Sustainable Logistics: Responses to a Global Challenge*. Springer.

Gonzalez-Feliu, Jesus. *Sustainable urban logistics: Planning and evaluation*. John Wiley & Sons, 2018.

Macharis, Cathy, et al., eds. *Sustainable logistics*. Emerald Group Publishing, 2014.

10. Subject: Leadership and Entrepreneurship

Content:

What is the role of Creativity(C) and Innovation (I) in organizations- Definition of C&I – Types of Innovations – the S-curve – Idea Generation, Lateral Thinking, Eight-Dimensional Approach to Ideation – TRIZ Methodology – Recognizing Opportunities – Creativity and Creative

Groups – Enhancing Creativity – Creativity in Problem Solving – Idea Evaluation – Teams, the Environment, and Creativity – Leading for Creativity and Innovation – Creativity to Innovation – The Role of Champions – Moving Innovation to Market.

Leadership in the 21st Century - Develop leadership skills to organise the firm's management and culture to promote efficient and productive workplace environments.

Managing and Motivating Talent - Develop key people management skills to motivate, organize, and reward people in an organization for corporate and social success.

Managing the Global Firm - Leverage new mindsets, new decision models, new business models, and new products and services to maximize firm's potential in fast-moving, interconnected, and global markets.

Strategic Management: Competitive and Corporate Strategy - Design and implement strategies that drive growth for organizations and maintain competitive advantage in the marketplace using the tools and frameworks required to evaluate, develop and execute a successful strategy, both inside and outside the corporation.

Text Books

Managing Creativity and Innovation, Harvard Business School Press. Thinkertoys, by Michael Michalko, Ten Speed Press.

The Art of Innovation, by Tom Kelley, Crown Business

Richter, Nancy, Paul Jackson, and Thomas Schildhauer, eds. Entrepreneurial innovation and leadership: preparing for a digital future. Springer, 2018.

McCauley, Pamela. Essentials of engineering leadership and innovation. CRC Press, 2017.

Northouse, Peter G. Leadership: Theory and practice. Sage publications, 2021.

11. Subject: Business law and Contract Management

Content: Overview of Business Law: Definitions and Scope; Types of Business Entities: Sole Proprietorship, Partnership, Corporation; Legal Rights and Obligations in Business Transactions; Ethical Considerations in Business Law; Contract Formation and Elements; Contract Terms and Interpretation; Contract Drafting and Negotiation; Contract Management; Dispute Resolution and Legal Remedies; International Business Contracts; International Contracts and Cross-Border Transactions; Legal Aspects of Import and Export Business; International Arbitration and Dispute Resolution; Cultural and Jurisdictional Challenges in International Contracts.

Text Books

August, Ray, Don Mayer, and Michael B. Bixby. *International business law: text, cases, and readings*. Pearson, 2013.

Mann, R. A., & Roberts, B. S. (2013). *Business Law and the Regulation of Business*. South-Western College Publishing.

Corrales, Marcelo, Mark Fenwick, and Helena Haapio, eds. *Legal tech, smart contracts and blockchain*. Singapore: Springer, 2019.

12. Subject: Lean Six Sigma in Logistics and Supply Chain

Content: Introduction to Lean Six Sigma in Logistics; Data Collection and Analysis; Cause and Effect Analysis (Fishbone Diagram); Failure Mode and Effects Analysis (FMEA); Regression Analysis and Correlation; Hypothesis Testing: t-tests, ANOVA, Chi-Square Tests; Lean Tools for Waste Reduction: Kanban, Poka-Yoke, SMED; Design of Experiments (DOE); Solutions Implementation and Validation; Change Management in Lean Six Sigma Projects; Control Charts and Process Monitoring; Advanced Lean Six Sigma Tools; Case Studies and Industry Applications.

Text Books

Baker, B. (2003). Lean Six Sigma: Combining Six Sigma Quality With Lean Speed. *Quality Progress*, 36(10), 96.

Taghizadegan, S. (2010). *Essentials of lean six sigma*. Elsevier.

Antony, J. (2023). *Design of experiments for engineers and scientists*. Elsevier.

Montgomery, D. C. (2017). *Design and analysis of experiments*. John wiley & sons.

13. Subject: Managing people and organizations

Content: Introduction to Managing People and Organizations; Leadership and Communication: Leadership Theories: Trait, Behavioral, and Contingency Approaches; Communication Skills for Effective Leadership; Conflict Resolution Strategies; Emotional Intelligence and Leadership; Theories of Motivation: Maslow, Herzberg, Expectancy Theory; Performance Appraisal and Feedback Techniques; Employee Engagement and Job Satisfaction Rewards and Recognition Programs; Team Dynamics and Collaboration; Organizational Culture and Change Management; Diversity, Inclusion, and Ethical Leadership; Strategic Human Resource Management; Case studies.

Text Books

Griffin, Ricky W., and Jean Phillips. *Organizational behavior: Managing people and organizations*. CENGAGE learning, 2023.

Martin, Graeme, and Sabina Siebert. *Managing people and organizations in changing contexts*. Routledge, 2016.

14. Subject: Applied GIS & Spatial Data Analytics

Content: Introduction to GIS and Spatial Data; Spatial Data Acquisition and Preprocessing; Spatial Data Visualization tools; Geospatial Analysis Techniques; Advanced Spatial Data Analytics; Applications in Various Fields; Real-world GIS Applications: Case Studies; Future Trends and Industry Applications.

Text Books

Stillwell, John, and Graham Clarke, eds. *Applied GIS and spatial analysis*. Chichester: Wiley, 2004.

Bivand, Roger S., et al. *Applied spatial data analysis with R*. Vol. 747248717. New York: Springer, 2008.

Fischer, Manfred M., and Arthur Getis, eds. *Handbook of applied spatial analysis: software tools, methods and applications*. Berlin: Springer, 2010.

15. Subject: Behavioral SCM

Content: Introduction to Behavioral Supply Chain Management; Human Behavior in Supply Chain Decision Making; Cognitive Biases in SCM; Motivation and Team Dynamics; Behavioral Aspects of Supplier and Customer Relationships; Sustainable Supply Chain and Social Responsibility; Technology and Innovation in Behavioral SCM; Future Trends in Behavioral SCM: Industry 4.0; Case studies.

Text Books

Donohue, K., Katok, E., & Leider, S. (Eds.). (2018). *The handbook of behavioral operations*.

Bendoly, E., Van Wezel, W., & Bachrach, D. G. (Eds.). (2015). *The handbook of behavioral operations management: Social and psychological dynamics in production and service settings*. Oxford University Press.

16. Subject: AR/VR in Logistics

Content: Introduction to AR/VR Technologies; AR/VR in Warehouse Management; AR/VR in Transportation and Logistics; Virtual Reality Simulations; Hands-on Session: Developing AR Applications for Customer Interaction; Industry Adoption and Case Studies; Future Trends: AR Cloud, Mixed Reality and others.

Text Books

Hunter, Leah. *Augmented Reality for the Industrial Enterprise: A Hands-on Introduction to Rapid AR Development*. O'Reilly Media, 2017.

Ma, Dengzhe, et al., eds. *Virtual reality & augmented reality in industry*. Berlin, Heidelberg: Springer Berlin Heidelberg, 2011.

Rejeb, Abderahman, et al. "The potentials of augmented reality in supply chain management: A state-of-the-art review." *Management review quarterly* (2020): 1-38.

17. Subject: Innovations in Waste Management

Content: Introduction to Waste Management Challenges; Waste-to-Energy Technologies; Advanced Recycling Techniques; Circular Economy and Sustainable Waste Management; Waste Reduction and Minimization; Smart Technologies and Data Analytics in Waste Management; Case Studies and Industry Applications.

Text Books

Bilitewski, B., Härdtle, G., & Marek, K. (2013). *Waste management*. Springer Science & Business Media.

Liu, L., & Ramakrishna, S. (Eds.). (2021). *An introduction to circular economy*. Springer.

Singh, N. K., Pandey, S., Sharma, H., & Goel, S. (Eds.). (2020). *Green innovation, sustainable development, and circular economy*. CRC Press.

18. Subject: Management of Intellectual Property Rights (IPR) for Logistics

Content: Introduction to Intellectual Property Rights (IPR); Patents and Innovations in Logistics; Trademarks and Brand Protection; Copyrights and Creative Works in Logistics; Trade Secrets and Confidential Information; Intellectual Property Management and Strategy; Case Studies and Industry Applications.

Text Books

Radhakrishnan, R., Radhakrishnan, R., & Balasubramanian, S. (2008). *Intellectual Property Rights: Text and Cases*. Excel Books India.

Ramakrishna, B., & HS, A. K. (2017). *Fundamentals of intellectual property rights: for students, industrialist and patent lawyers*. Notion Press.

19. Subject: Materials Handling Systems

Content: Introduction to Materials Handling; Types of Materials Handling Equipment: Conveyor Systems: Belt, Roller, Screw Conveyors, Industrial Trucks: Forklifts, Pallet Jacks, Order Pickers, Overhead Cranes and Hoists, Automated Guided Vehicles (AGVs) and Robotics; Automated Storage and Retrieval Systems (AS/RS); Robotic Material Handling; IoT and Sensors application; Warehouse Design and Optimization; Cold Storage and Refrigerated Materials Handling; Hazardous Materials Handling and Compliance; Bulk Materials Handling: Silos, Hoppers, and Conveying Systems; Sustainability and Green Materials Handling; Case Studies and Industry Applications.

Text Books

Reese, C. (2000). *Material Handling Systems: Designing for Safety and Health*. CRC Press.

Frazelle, E. H. (2016). *World-class warehousing and material handling*. McGraw-Hill Education.

20. Subject: Digital Innovation and Technology in SCM

Content:

Digital transformation of supply chain relationships. In-depth understanding of the perspectives, roles, and decisions of relevant stakeholders in transforming supply chains in the digital era. Digital supply chain capabilities (Visibility, Agility, Collaboration, Omnichannel), the role of technology (Blockchain, IoT, AI, Digital Twins), processes and organizations, as well as digital platforms and performance. Artificial Intelligence Driven SCs: Challenges and

Opportunities. Industry 4.0 and Digital Transformation.

Supply Chain Digitization: Unified View of Demand, Understand how to integrate internal and external data, Develop an Effective demand forecasting process that brings together supply planning, financial planning, sales, and trade planning, Understand effective mechanisms to ensure adaptability, Supply Chain Segmentation, Smart S&OP, Smart Execution, and Control Tower, Develop a roadmap for a successful supply chain digitization: The Journey to Success; Organizational structure; Change Management. Relevant case studies of digitally transformed supply chains, long-term competitive advantage of successful case studies, through operations and digital enhanced value generation.

Text Books

Designing and Managing the Supply Chain: Concepts, Strategies and Case studies (4th Edition) by David Simchi Levi, Edith Simchi Levi, Ravi Shankar, Philip Kaminsky. McGraw Hill Education. Copyright © 2022

MacCarthy, Bart L., and Dmitry Ivanov, eds. The digital supply chain. Elsevier, 2022.

21. Subject: Robotic Process Automation

Content: Introduction to RPA; RPA Development and Implementation; Advanced RPA Techniques; RPA Deployment and Management; RPA Integration with Enterprise Systems; Future Trends in RPA: Intelligent Automation, Hyperautomation, and Beyond; Case Studies and Industry Applications.

Text Books

Taulli, T. (2020). The robotic process automation handbook. *The Robotic Process Automation Handbook*. <https://doi.org/10.1007/978-1-4842-5729-6>.

Supply Chain Management: Strategy, Planning, and Operation (7th Edition), Sunil Chopra, Peter Meindl, Prentice Hall.

22. Subject: Supply Chain Network Design

Content: Introduction to Supply Chain Network Design; Network Modeling and optimization; Facility Location and Capacity Planning; Inventory and Transportation in Network Design; Demand Forecasting and Demand-Sensitive Networks; Outsourcing, Collaboration, and Network Resilience; Real-life Applications and Industry Best Practices.

Text Books

Watson, M. (2013). *Supply chain network design: applying optimization and analytics to the global supply chain*. Pearson education.

Simchi-Levi, D., Kaminsky, P., Simchi-Levi, E., & Ji, J. (2000). Designing and managing the supply chain.

23. Subject: Blockchain and Smart Contracts

Content:

Basics of blockchain: *blockchain fundamentals, defining blockchain, elements of a blockchain, qualities of blockchains*, Blockchain technology: *types of blockchains, evolving the blockchain stack, hurdles of adoption*, *Basics of Cryptography*, Consensus algorithm: *proof-of-work consensus algorithm, proof-of-stake consensus algorithm, decentralized autonomous organizations*.

Supply contracts: *buy-back contracts, revenue sharing contracts, quantity-flexibility contracts, sales rebate contracts*, Contracts for Make-to-stock/make-to-order supply chains: *payback contracts, cost sharing contracts*, Contracts with asymmetric information: *capacity reservation contracts, advanced purchase contracts*, Contracts for non-strategic components: *long-term contracts, flexible or option contracts, Spot purchase, Portfolio contract*.

Introduction to Smart Contracts, Ethereum and Solidity, Components of Smart Contracts, Smart Contract Security, Smart Contract Deployment, Legal and Regulatory Considerations, Smart Contract Development Tools, Future Trends: Emerging technologies and trends in smart contracts (e.g., non-fungible tokens, DeFi, DAOs), Integration with IoT and AI.

Text Books

Lantz, Lorne, and Daniel Cawrey. *Mastering blockchain*. O'Reilly Media, 2020.

Compagnucci, Marcelo Corrales, Mark Fenwick, and Stefan Wrba, eds. *Smart contracts: Technological, business and legal perspectives*. Bloomsbury Publishing, 2021.

Corrales, Marcelo, Mark Fenwick, and Helena Haapio, eds. *Legal tech, smart contracts and blockchain*. Singapore: Springer, 2019.

Imran, B. "Mastering Blockchain: Deeper insights into decentralization, cryptography." *Bitcoin, and popular Blockchain frameworks* (2017).

24. Subject: Negotiations & Stakeholder Management

Content: Introduction to Negotiations and Stakeholder Management; Stakeholder Analysis: Identifying and Prioritizing Stakeholders; Negotiation Preparation and Strategy; Cognitive Biases and Their Impact on Decision Making; Advanced Negotiation Techniques; Advanced Negotiation Techniques; Case Studies and Industry Applications.

Text Books

Fells, R., & Sheer, N. (2019). *Effective negotiation: From research to results*. Cambridge University Press.

Lewicki, R. J., Saunders, D. M., Minton, J. W., Roy, J., & Lewicki, N. (2018). *Essentials of negotiation* (p. 304). Boston, MA, USA: McGraw-Hill/Irwin.

Rockmann, K. W., Langfred, C. W., & Cronin, M. A. (2019). *Negotiation: Moving from conflict to agreement*. SAGE Publications.

25. Subject: Supply Chain Finance

Content:

Corporate Finance – Short Term Financing – Supply Chain Costs for Design – Role Of Working Capital In Supply Chain Design - Impact of Global Regulatory & Tax Factors Upon

Supply Chain Design - Measuring Your Supply Chain: CFO Perspective - Balanced Scorecards For Supply Chain: CSCO Perspective - Making Capital Improvements To The Supply Chain - Driving Working Capital Improvement Supply Chain For A New Product Launch.

The Supply Chain Finance Industry: Market constituents, Market enablers Market challenges Value propositions; State of the Market: Current market size, Prospects for growth, Market penetration, Regions and industries; Products and Solutions: Working Capital, Receivables financing, Reverse factoring, Approved payables financing, Dynamic discounting, Legal considerations; Stakeholders and Market Participants: Buyers Suppliers Global commercial banks Regional banks Development banks Non-banks Technology providers Enablers; Role of traditional trade finance products. Key components of trade cycle analysis, Application and implementation of supply chain finance techniques and associated legal, technological, cost and risk implications, Importance of innovation and strategy, the management of foreign exchange exposures.

Textbooks

Simon Templar, Erick Hofmann, *Financing the End-to-End Supply Chain: A Reference Guide to Supply Chain Finance (2nd Edition)*, Kogan Page Publishers.

Zhao, Lima, et al. *Supply chain finance*. Springer International Publishing, 2018.

Rogers, Dale S., Rudolf Leuschner, and Thomas Y. Choi. *Supply chain financing: Funding the supply chain and the organization*. World Scientific, 2020.

26. Subject: Procurement and Materials Management

Content:

Role and Functions of Procurement; Spend Analysis; Vendor Development and Rating Systems; Inventory Policy Control Systems; Make or Buy Decisions; Negotiations; Material Costing and Budgeting; Spare Parts Planning and Procurement; Legal Aspects in Procurement and Contracts; Total Cost of Ownership; Logistics/Transportation Cost Analysis.

Text Books

Purchasing and Supply Management: Text and Cases, (1996), Dobler DW, Burt, DN, Tata McGraw Hill, New Delhi.

Purchasing and Supply Chain. Management, 5e. Robert M. Monczka, Robert B.Handfield,., Larry C. Giunipero, James L. Patterson, Cengage Learning.

27. Subject: Climate change and resilience

Content: Climate Science: Causes and Effects; Global Climate Agreements: Paris Agreement and COP Conferences; Climate Change and Biodiversity Loss; Environmental Justice and Climate Vulnerability; Social and Economic Impacts of Climate Change; Climate-Resilient Infrastructure Development; Water Resource Management and Conservation; Sustainable Agriculture and Land Use Planning; Green Building and Urban Planning; Renewable Energy Sources: Solar, Wind, and Hydroelectric Power; Carbon Capture and Storage Technologies;

Sustainable Transportation Solutions; Circular Economy and Waste Management; Business Resilience and Corporate Sustainability.

Text Books

Rajkovich, N. B., & Holmes, S. H. (2022). *Climate Adaptation and Resilience Across Scales: From Buildings to Cities* (p. 286). Taylor & Francis.

Enamul Haque, A. K., Mukhopadhyay, P., Nepal, M., & Shammin, M. R. (2022). *Climate Change and Community Resilience: Insights from South Asia*.

Leal Filho, W. (Ed.). (2020). *Handbook of climate change resilience*. Springer.

28. Subject: Logistics for Naya Bharat

Content: Introduction to Logistics in New India; Supply Chain Optimization for Indian Market; Transportation and Warehousing Strategies; E-commerce Logistics and Last-Mile Delivery; Sustainable and Green Logistics Practices; Regulatory Compliance and International Logistics; Case Studies and Industry Applications.

Text Books

Manoj K. Tiwari (2023), *Towards Naya Bharat: a study of infrastructure, community and development*.

Logistics & Supply Chain Management, (Latest edition), Martin Christopher, Prentice Hall.

Business Logistics: Supply Chain Management (Latest Edition) L Ronald H. Ballou, Prentice Hall.

Introduction to Logistics Systems Management (2nd Edition): Gianpaolo Ghiani, Gilbert Laporte, Roberto Musmanno, Wiley.

29. Case studies of successful startups/Unicorns in Logistics.

30. Case studies related to PM Gati Shakti NMP.