



**NATIONAL INSTITUTE OF TECHNOLOGY CALICUT**

**Syllabus for the Certificate Programme**

**in**

**Logistics and Supply Chain Management (LSCM)**

***(July – December)***

**Conducted by**



**Centre of Excellence in Logistics and Supply Chain Management**

## **Curriculum and Syllabus**

### **Certificate Programme-1 (Logistics and Supply Chain Management)**

| <b>Course Code</b> | <b>Course Name</b>                         | <b>Credits</b> |
|--------------------|--------------------------------------------|----------------|
| LS4101A            | Introduction to Logistics and Supply Chain | 2              |
| LS4102A            | Inventory Management                       | 3              |
| LS4103A            | Warehouse Planning and Operations          | 3              |
| LS4104A            | Production Planning and Freight Management | 2              |
| LS4105A            | Port Operations and Management             | 3              |
| LS4106A            | Fundamentals of Geography                  | 2              |
| LS4107A            | Mathematics and Measurements for Trade     | 2              |
| LS4108A            | Communicative English                      | 1              |
| LS4109A            | Internship                                 | 2              |
| LS4110A            | Supply Chain Operations Simulation Lab     | 2              |

## LS4101A INTRODUCTION TO LOGISTICS AND SUPPLY CHAIN

**Pre-requisites:** Nil

**Total Lecture Sessions:** 26

| L | T | P | O | C |
|---|---|---|---|---|
| 2 | 0 | 0 | 4 | 2 |

**Course Outcomes:**

CO1: Describe the fundamental concepts of logistics and supply chain management.

CO2: Identify the key components and functions within a supply chain.

CO3: Analyze the role of logistics in supply chain management.

CO4: Develop the technological applications in logistics and supply chain operations.

CO5: Solve problems related to logistics and supply chain operations.

Definition and Importance of Supply Chain Management, Evolution of Supply Chain Management, Logistics - definition and scope of Logistics, activities of Logistics, Inbound and Outbound Logistics, Flows in a supply chain, Entities in a supply chain, Discussion with Case Studies.

Customer service and cost trade-offs - dimensions, customer value, total cost of ownership, Porter's generic competitive strategies, Decision phases in a supply chain, process views in a supply chain, competitive and supply chain strategies, responsive and efficient supply chain, supply chain drivers, role of each driver in supply chain and their related performance metrics.

Outsourcing and Third-Party Logistics (3PL), make versus buy decisions, core competencies, sourcing strategy, supplier selection using Multi-criteria decision methods. Role of distribution - design options for a distribution network, Network design - models for facility location and capacity allocation - data for network design spreadsheet-based modelling and analysis. Vehicle Routing Problems.

Sustainable Supply Chain Practices, Environmental Impact of Logistics Operations, Climate Change and Its Effect on Global Supply Chains, Green Logistics and Environmental Regulations

Emerging Trends in Logistics and Supply Chain - Digital Transformation and Industry 4.0, Internet of Things (IoT) in Supply Chain, Blockchain Technology in Supply Chain, Future Trends and Innovations, Real-World Supply Chain and Logistics Case Studies, Best Practices in Various Industries through discussions with practising managers and industry experts

**References:**

1. M. Christopher, Logistics and Supply Chain Management, FT Publishing International, 2016.
2. J. Shah, Supply Chain Management –Text and Cases. Pearson Education, 2016.
3. S. Chopra and P. Meindl, Supply Chain Management: Strategy, Planning, and Operation. Pearson Prentice Hall of India, 2016.
4. D. S. Levi, P. Kaminsky, E. S. Levi, and R. Shankar, Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies. Tata McGraw-Hill, 2008.

## LS4102A INVENTORY MANAGEMENT

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 3 | 0 | 0 | 6 | 3 |

**Total Lecture Sessions:** 39

### **Course Outcomes:**

CO1: Identify the various types of inventory and their functions within a business unit.

CO2: Explain the significance of inventory in business operations, its impact on business efficiency and profitability.

CO3: Discuss the importance of inventory location and control for optimizing business operations.

CO4: Examine different inventory planning and replenishment systems, identifying their advantages and disadvantages.

CO5: Investigate the key performance indicators (KPIs) used to measure the effectiveness of inventory control systems.

Introduction to Inventory Management: Concepts and issues, Inventory – who needs it, Inventory costs, Purpose of inventory, Types of stocks.

Inventory as Money: Accounting for inventories, how inventory is valued, Inventory on the balance sheet, Inventory on the income statement, Inventory measure using ratio analysis, Profit margins, Merchandise metrics, Obsolete stock, Methods of disposal, Determination of carrying cost.

Physical Location and Control of Inventory: Common locator systems, Common item-placement theories, Location addresses and SKU identifiers, Inventory distribution considerations, Automatic identification, Basics of bar coding, scanning basics, RFID.

Inventory Planning and Replenishments: Selective inventory control systems, Replenishment costs, Independent demand inventory, Types of inventory control systems – Continuous review inventory control systems and periodic review inventory control systems, Various models – EOQ, Quantity discounts, Batch production systems, Economic order interval, Order up to level inventory systems, Safety stocks in different inventory control systems, Single order quantity systems, Dependent demand inventory – Material requirements planning, Just-in-time control systems – milk runs, Point-of-use supply, small lot production/supply enablers, Enterprise resource planning.

Why Inventory System Fail and How to Fix Them: Metrics – Fill rate, and Inventory record accuracy, Tools to uncover system dysfunction – Run charts, flow charts, Location charts, Variance reports, Cycle counting – Different methodologies, A-B-C analysis cycle count method.

Discussion of different cases related to inventory management.

### **References**

1. M. Muller, *Essentials of Inventory Management*, 3rd Edition, Harper Collins Leadership, 2019. (This book can be considered as the text book.)
2. R. J. Tersine, *Principles of Inventory and Materials Management*, 4th ed., Prentice-Hall Inc., New Jersey, 1994.
3. S. Chopra, P. Meindl, and D. V. Kalra, *Supply Chain Management: Strategy, Planning and Operations*. 7th ed. Pearson Education Ltd, 2018.
4. D. Simchi-Levi, P. Kaminsky, E. Simchi-Levi, and R. Shankar, *Designing & Managing the Supply Chain: Concepts, Strategies & Case studies*. 4th ed., McGraw-Hill Education, 2022.

## LS4103A WAREHOUSE PLANNING AND OPERATIONS

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 3 | 0 | 0 | 6 | 3 |

**Total Lecture Sessions:** 39

### **Course Outcomes:**

CO1: Identify levels of various decision phases in Warehouse planning and operations

CO2: Describe various warehouse operations

CO3: Apply tools and techniques to improve warehouse operations

CO4: Develop warehouse layout for efficient operations

CO5: Comprehend the need for automation in warehousing

Importance of warehouses, Types of warehouses, Square Root rule, Supply chain trends affecting warehouses, The growth of e-fulfilment and its effect on the warehouse, Warehousing standards. Understanding Warehouse Management Function and Operations - Role of a Warehouse and a Warehouse Manager, Major Warehouse Processes and End-to-End Warehouse Operations. Warehouse operations: Receiving, Put-away, Order-picking, Sharing the work of order-picking, Checking and packing, Shipping.

Warehouse Layout and Material Handling - Order picking methods, Warehouse Layout, Material Handling Systems in a Warehouse and Other Resources, Storage and handling equipment -Types and their purposes.

People Aspects in a Warehouse and Warehouse Safety - People management in a Warehouse, Health and Safety issues in a Warehouse.

Cost Analysis and Performance Management - Warehouse performance, Key Performance Indicators, Benchmarking.

Policy and Regulatory framework in warehouse management: Warehousing Development and Regulatory Authority (WDRA) certification and Quality Council of India (QCI) ratings of warehouses.

Warehouse Automation - Smart Warehouses, Use of AI in warehouses, Mechanization and Automation of warehouse – RFID leveraged warehouse systems, Application areas and technological advancements in Warehouse automation, Latest trends in Warehouse Automation, Warehouse operations simulations.

### **References:**

1. G. Richards, Warehouse management: a complete guide to improving efficiency and minimizing costs in the modern warehouse. Kogan Page Publishers, 2017.
2. J.J. Barthold and S.T. Hackman, Warehouse & Distribution Science, The Supply Chain & Logistics Institute, H. Milton Stewart School of Industrial and Systems Engineering, Georgia Institute of Technology, 2019
3. S. B. Keller and B. C. Keller, The definitive guide to warehousing: managing the storage and handling of materials and products in the supply chain. Pearson Education.2013.
4. J. A. Tompkins, J. D. Smith, The warehouse management handbook. Tompkins press 1998.
5. e -Handbook on Warehousing Standards, Warehousing Association of India, 2022

## LS4104A PRODUCTION PLANNING AND FREIGHT MANAGEMENT

**Pre-requisites:** Nil

**Total Lecture Sessions:** 26

| L | T | P | O | C |
|---|---|---|---|---|
| 2 | 0 | 0 | 4 | 2 |

### **Course Outcomes:**

**CO1:** Explain the characteristics of production systems and evaluate the process performance

**CO2:** Apply suitable forecasting techniques

**CO3:** Construct production plans, implement JIT systems with Kanbans, and integrate Lean principles

**CO4:** Illustrate the documentation for logistics operations

**CO5:** Explain about specialized wagons and the associated logistics in freight movement

Characteristics of modern production systems: push and pull production systems; Various manufacturing processes, organisation of manufacturing processes (layouts). Introduction to Forecasting techniques - time series analysis: components of time series, moving average, simple exponential smoothing, simple regression.

Aggregate production planning, master production scheduling, production activity control, types of Gantt chart, Principles of Just-in-Time (JIT) - push and pull systems, Kanban systems, setting number of Kanbans, Lean Engineering concepts and practices.

Logistics documentation: Bill of Lading (B/L) - Types Straight, Shipped, Through, Air Waybill, etc., Commercial Invoice- contents and formats, Packing List, Certificate of Origin, Insurance Certificate: Coverage and requirements. Regulatory and Compliance Documents, Automation in logistics documentation - Blockchain technology and its role in securing document integrity

Specialized vehicles for freight movement – Types and carrying capacities, Rate circulars and comparative insights from other countries, Overview of FIOS (Freight Operations Information System), In motion weigh bridges and punitive charges, Off Season and Peak season in freight movements, Bulk and bag handling in warehouses and Silos (Hub and Spoke silos), Specialized containers for silo-based freight transport, Cases in Rail mode of transport.

### **References:**

1. B. Mahadevan, 2015. Operations Management: Theory and Practice, Pearson Education.
2. R. B. Chase , R. Shankar, and F.R. Jacobs, 2015, Operations and Supply Chain Management, 14th ed. McGraw Hill Education (India) Private Limited.
3. F.R. Jacobs, W.L. Berry, D.C. Whybark, and T.E. Vollmann, 2015, Manufacturing Planning and Control for Supply Chain Management, 6th ed., McGraw Hill Education (India).
4. C. Rama Gopal, 2008. Export Import Procedures: Documentation and Procedures, New Age International Publishers.
5. S.K. Nandi, and S. L. Ganapathi, 2015. Logistics Management, Oxford University Press, New Delhi.

## LS4105A PORT OPERATIONS AND MANAGEMENT

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 3 | 0 | 0 | 6 | 3 |

**Total Lecture Sessions: 39**

### **Course Outcomes:**

CO1: Explain the activities and stakeholders integral to effective port management.

CO2: Apply decision making tools and techniques for planning and managing port operations.

CO3: State the economic, pricing, and financial principles associated with port operations.

CO4: Identify the role of ports in global logistics and supply chain management.

CO5: Describe the safety and sustainability aspects related to port operations

Port management and operations; Port terminologies: cargo owner, shipper, vessel operators, charterers, consignee, notify party, liners, stevedore, ship chandlers, berth, terminal, forklift, customs, immigration etc.; Port - roles and functions including Customs and DG shipping; Port organizational structure.

Port facilities and layout – Berths and terminals; Berth allocation problem; Quay crane assignment problem; Quay crane scheduling problem; Stowage planning problem; Yard management; Yard crane scheduling; Horizontal transportation.

Landside operations planning; Workforce planning; Cargo and cargo handling; Port capacity planning; Port pricing strategies; Port and logistics systems; Port and Supply chain networks; Environmental principles of port operations; Principles and procedures for environmental management in ports; Port performance and benchmarking; Port Authorities and Regulatory Framework; Port safety management.

Containerisation – types, design and specifications, container tracking and security, types of ships used in maritime transport. Evaluation and Quality Control (EQC) of global products – documentation. An overview about multimodal transportation including Inland water ways – challenges and opportunities, Inland Waterways – operations for shipping and navigation.

### **References:**

1. Alderton, P. (2008). Lloyd's practical shipping guides. *Port management and operations*. London: Informa, 429.
2. Bichou, K. (2014). *Port operations, planning and logistics*. CRC Press.
3. M. G. Burns. Port Management and Operations. 1st Edn. CRC Press, 2015.
4. T. Notteboom, A. Pallis, J-P Rodrigue. Port Economics, Management and Policy. 1st Edn.
5. Routledge, London, 2022.

## LS4106A FUNDAMENTALS OF GEOGRAPHY

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 2 | 0 | 0 | 4 | 2 |

**Total Lecture Sessions:** 26

### **Course Outcomes:**

CO1: Demonstrate the importance of Geography in logistics and supply chain contexts

CO2: Distinguish the various global economic zones and their influence on global trade and supply chains.

CO3: Examine the geopolitics and global trade in logistics and supply chain contexts

CO4: Appraise about the customs, tariffs and trade regulations

CO5: Apply Geographic Information Systems (GIS) in logistics and supply chain problems

Introduction to Geography - Definition and Importance of Geography, Branches of Geography: Geographic Tools and Technologies: Maps, GPS, GIS. Earth's Structure and Landforms, Climate and Weather Patterns, Impact of Physical Geography on Supply Chains.

Population Distribution and Demographics, Global Economic Zones, Transportation Networks and Infrastructure, Geographical Challenges in Transportation, Major Global Trade Routes, Global Trade and Commerce, Regional Economic Integration, Trade Blocs and Agreements (e.g., NAFTA, EU, ASEAN), Impact of Economic Geography on Supply Chains

Political Boundaries and Borders, Geopolitics and Global Trade, Customs, Tariffs, and Trade Regulations, Impact of Political Geography on Supply Chains.

Geographic Information Systems (GIS) in Supply Chain - Introduction to GIS and Its Applications, Spatial Analysis for Supply Chain Optimization, Case Studies: GIS in Logistics and Transportation, Practical Exercises with GIS Tools, PM Gatishakti platform for logistic operations.

### **References:**

1. H. J. de Blij and P.O.Muller, Geography: Realms, Regions and Concepts, John Wiley 2020
2. P. Knox, J. Agnew, and L.Mccarthy, The Geography of the World Economy, Routledge, 2008.
3. K-T Chang, Introduction to Geographic Information Systems, McGraw Hill Education, 2017.
4. M.J.De Smith, M.F. Goodchild, and P.Longley, Geospatial Analysis: A Comprehensive Guide to Principles, Techniques and Software tools, Matador 2007.

## LS4107A MATHEMATICS AND MEASUREMENTS FOR TRADE

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 2 | 0 | 0 | 4 | 2 |

**Total Lecture Sessions:** 26

### **Course Outcomes:**

CO1: Illustrate the arithmetic operations required in the context of logistics and supply chain

CO2: Distinguish the measurement systems and units associated with logistics operations

CO3: Utilize the technology in measurements for trade

CO4: Apply data analysis and data visualization tools for decision making

Revision on Arithmetic Operations, Percentages, Ratios and Proportions, Basic Algebraic Concepts.

Measurement Systems and Units - Standard Units of Measurement: Metric and Imperial Systems, Converting Units of Measurement, Linear measurements, Weight measurements, Temperature measurements, Pressure measurements, Common Measurements in Supply Chain: Perimeter, Area, Volume and Weight measurements. Accuracy and Precision in Measurements, Transportation and Logistics Mathematics - Distance and Time Calculations.

Use of Technology in Measurements - Introduction to Measurement Tools and Technologies, Barcodes and RFID in Inventory Management, GPS and Telematics in Transportation.

Overview of Data Analysis and Statistics - Descriptive Statistics: Mean, Median, Mode, Standard Deviation and Variance, Probability Concepts, Basic Data Visualization Tools and use of spreadsheets for calculation and analysis. Load Planning, Fuel Consumption and Cost Analysis

### **References:**

1. J. Lambert and C. Frye, Microsoft Excel 2016 Step by Step (Office 2021 and Microsoft 365), Microsoft Press.2021.
2. D.M. Levine, D.F. Stephan, and K.A. Szabat, Statistics for Managers, Using Microsoft Excel, Pearson Education, 2017.
3. M. Christopher, Logistics and Supply Chain Management, FT Publishing International, 2016.
4. C. Flinn and M. Overgaard, Math for Trades: Volume 2, BCcampus, 2021
5. R.A. Carman and H.M.Saunders, Mathematics for the Trades: A guided approach, Pearson, 2011.

## LS4108A COMMUNICATIVE ENGLISH

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 1 | 0 | 0 | 2 | 1 |

**Total Lecture Sessions: 13**

### **Course Outcomes:**

CO1: Demonstrate proficiency in various communication formats, adapting to different audiences and purposes.

CO2: Collaborate effectively in group settings and build strong interpersonal relationships.

CO3: Understand and navigate intercultural communication challenges

### **Types and Styles of Communication**

General Communication v/s Technical Communication–Basic Documents: Resumes, Cover Letters, CV, Statement of Projects, Correspondence – Oral Presentations: Presentation Style, Graphics In Presentation, Team Presentations– Peer Feedback

### **Impactful Communication**

Persuasive Communication – Authoritative Writing And Speaking – Impromptu Speaking and Presentation – Communication and Leadership

### **Communicating beyond borders**

Communication Across Cultures–Communicating with Diverse Audiences – Inclusive Communication–Ethical Considerations in Communication–Strategies and Approaches in Communication

### **References:**

1. Hamilton, L. (2014). Guide To Managerial Communication : Effective Business Writing And Speaking (10th Ed.). Pearson.
2. Holtz, Shel. Corporate Conversations. New Delhi: PHI. 2007.
3. Tuhovsky, Ian . (2015) Communication skills training: a practical guide to improving your social intelligence, presentation, persuasion and public speaking skill. CreateSpace Independent Publishing Platform.
4. Whitcomb, C. A., & Whitcomb, L. E. (2013). Effective Interpersonal And Team Communication Skills For Engineers. IEEE Press ; John Wiley & Sons.

## LS4109A INTERNSHIP

**Pre-requisites: Nil**

| L | T | P | O | C |
|---|---|---|---|---|
| 0 | 0 | 0 | * | 2 |

### **Course Outcomes:**

CO1: Understand the working culture of an industry, operating in Logistics and Supply Chain management.

CO2: Work on challenging real-life projects, under the guidance from experienced professionals.

CO3: Develop soft skills like communication and teamwork.

CO4: Carry out interactions with society, which would help in their professional career.

CO5: Prepare a technical report and presentation on the work done

An internship with a total duration of 4-6 weeks after the completion of classes is mandatory. It should preferably be done in an Industry in the field of Logistics and Supply Chain. The objective of the course is to enable the students to develop work culture, attitudes, as well as, communication and interpersonal skills necessary for job success. The students are made proficient to make proper technical documentation on the work done. Moreover, the course would train the students to make effective technical presentations. Evaluation of the work done and awarding the credit for the same are to be done on successful completion of the internship and submission of report.

\*To be decided by the organisation in which the internship is done

## LS4110A SUPPLY CHAIN OPERATIONS SIMULATION LABORATORY

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 2 | 0 | 0 | 4 | 2 |

**Total Lecture Sessions:** 8 sessions (12 hours)

### **Course Outcomes:**

CO1: Create awareness on the supply chain management concept through fun using roleplay game.

CO2: Identify the performance of supply chains under certain supply chain parameters.

CO3: Identify the coordination problems between supply chain members and the bullwhip effect in a supply chain..

CO4: Comprehend the need for managing the supply chain as a whole.

CO5: Appreciate the use of emerging technologies in the management of supply chains

### **Course Description (in Brief):**

Experiential learning, Roleplay game, general supply chain structures, Operational performance measures, order cost and carrying costs; Roleplay based operation simulation under different supply chain parameters such as lead times, lost sales and backorder; evaluation of fill rate, total supply chain inventory costs, and bullwhip effect; System dynamics; coordination analysis, comparison of performance of supply chain under different scenarios, Application of machine learning models based on the data generated by the role play games, blockchain, IoT, smart contract application uses cases.

### **Pedagogy:**

Lectures, Hands-on, Demo, Roleplay Simulations, Discussions in the class and handout for data collection during the simulation

### **Course content:**

| Session | Method                  | Content                                                                                                                                            |
|---------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.      | Lecture and Demo        | 1. (i) Lecture-1: Introductory lecture<br>(ii) Demo 1: Supply chain roleplay game software package – demo of key features and performance measures |
| 2.      | Lecture                 | 2. Lecture 2: Introduction on experiential learning, Inventory costs, general supply chain structures                                              |
| 3.      | Roleplay and Discussion | 3. (i) Roleplay -1: Trial game-1; Traditional supply chain setting – lost sales<br>(ii) Discussion: performance evaluation                         |
| 4.      | Roleplay and Hands- on  | 4. (i) Roleplay-2: Supply chain operation simulation under lost sales shortage management<br>(ii) Hands-on-1: Performance evaluation               |
| 5.      | Demo and Roleplay       | 5. (i) Demo-2: Traditional supply chain setting – backorder<br>(ii) Roleplay -3: Trial game-1; Traditional supply chain setting – backorder        |

| Session | Method                 | Content                                                                                                                                                                                                                                  |
|---------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |                        | (iii) Role play -4: Supply chain operation simulation under backorder shortage management                                                                                                                                                |
| 6.      | Roleplay and Hands- on | 6. (i) Roleplay -5: Advance demand information sharing - Supply chain operation simulation under lost sales shortage management<br>(ii) Hands-on-2: Comparison of different scenarios simulated<br>(iii) Feedback on roleplay simulation |
| 7.      | Discussion             | 7. Discussion: System dynamics, need for coordination, supply chain as a multiagent and delayed feedback system                                                                                                                          |
| 8.      |                        | 8. Lecture: Application of machine learning models based on the data generated by the role play games, blockchain, IoT, smart contract application uses cases.                                                                           |

#### References:

1. V. Madhusudanan Pillai, Supply chain role play game exercise handout, Department of Mechanical Engineering, 2017.
2. Dony S. Kurian, V. Madhusudanan Pillai and J. Gautham, Data-driven imitation learning-based approach for order size determination in supply chains. European J. of Industrial Engineering, Vol. 17, No. 3, pp. 379 – 407.
3. Justin Sunny, V. Madhusudanan Pillai, Hiran V. Nath, Kenil Shah, Prajwal Pandurang Ghoradkar, Manu Jose Philip and Malhar Shirswar, Blockchain-enabled beer game: a software tool for familiarizing the application of blockchain in supply chain management, Industrial Management & Data Systems, Vol. 122, No. 4, pp. 1025-1055, 2022.
4. Justin Sunny, Naveen Undralla and V. Madhusudanan Pillai, (2020), Supply Chain Transparency through Blockchain-Based Traceability: An Overview with Demonstration. Computers and Industrial Engineering, Vol. 150, 106895



**NATIONAL INSTITUTE OF TECHNOLOGY CALICUT**

**Syllabus for the Certificate Programme**

**in**

**International Trade Management (ITM)**

***(January - June)***

**Conducted by**



**Centre of Excellence in Logistics and Supply Chain Management**

## Curriculum and Syllabus

### Certificate Programme-2 (International Trade Management)

| Course Code | Course Name                               | Credits |
|-------------|-------------------------------------------|---------|
| LS4201A     | International Trade Policy and Operations | 3       |
| LS4202A     | Supply Chain Finance                      | 3       |
| LS4203A     | International Marketing Management        | 3       |
| LS4204A     | Customs Procedures and EXIM Documentation | 3       |
| LS4205A     | Transportation Planning and Operations    | 3       |
| LS4106A     | Fundamentals of Geography                 | 2       |
| LS4107A     | Mathematics and Measurements for Trade    | 2       |
| LS4108A     | Communicative English                     | 1       |
| LS4206A     | Internship                                | 2       |

## LS4201A INTERNATIONAL TRADE POLICY AND OPERATIONS

**Pre-requisites:** Nil

**Total Lecture Sessions:** 13

| L | T | P | O | C |
|---|---|---|---|---|
| 3 | 0 | 0 | 6 | 3 |

### **Course Outcomes:**

- CO1: Understand international trade principles and protectionism
- CO2: Comprehend India's role in international trade and agreements
- CO3: Explore international trade theories and apply them to real-world scenarios
- CO4: Analyze exchange rate mechanisms and foreign exchange transactions:
- CO5: Execute export-import documentation and payments

Introduction to International Trade and Protectionism - Need for Protectionism and Strategies, India's International Trade: Latest Facts and Figures, Facts on Trade Facilitation, International Trade Growth, The Bretton-Woods Conference - International Monetary Fund and General Agreement on Tariffs and Trade, The World Trade Organization, The Treaty of Rome and the European Union, Other Economic Agreements, Largest Exporting and Importing Countries, International Trade Drivers - Cost Drivers, Competition Drivers, Market Drivers, Technology Drivers, International Trade Theories - Theory of Absolute Advantage, Theory of Comparative Advantage, Factor Endowment Theory, International Product Life Cycle, Cluster Theory, Logistics Cluster Theory, The International Business Environment

International economics - Trade and money, Gains from Trade, Pattern of trade, Balance of payments, Exchange rate determination, Macroeconomic policy goals in an open economy - Internal Balance and External Balance,

Evolution and Basis, Basic Concepts, Volume of trade, sectoral composition and direction of trade, Types of International trade, Definition of Export and Import, understanding an Export Transaction, Preliminaries of starting Export Import Business. Exchange rate mechanism - Role of banks in Foreign Trade Transaction, Outward and Inward remittances in Foreign Exchange, Buying and Selling of Foreign Exchange. Different types of foreign currency rates. NOSTRO, VOSTRO and LORO accounts. Identifying and sourcing of the Buyers in the International market. Negotiation with the foreign prospective foreign Buyer.

Setting of an export organisation. Categories and types of Exports. Online procedure for obtaining IEC and RCMC. Forex / FTP policy provision regarding samples and Gifts. Export Order, its scrutiny, processing and execution. Payment Terms. Various methods of settlement of export/ Import transactions. Documents on collection and Letter of Credit, including understand of UCPDC.

### **References:**

1. P. Krugman, M. Obstfeld, and M. Melitz, *International Economics*, 10<sup>th</sup> Edition, Pearson Education, 2017
2. P. Krugman, M. Obstfeld, and M. Melitz, *International Trade: Theory and Policy*, 10<sup>th</sup> Edition, Pearson Education, 2017
3. F. Chrunilam, *International Trade and Export Management*, 21<sup>st</sup> Edition, Himalaya Publishing House, 2019
4. B. Seyoum, *Export-Import Theory, Practices and Procedures*, 3<sup>rd</sup> Edition, 2013.

## LS4202A SUPPLY CHAIN FINANCE

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 3 | 0 | 0 | 6 | 3 |

**Total Lecture Sessions:** 39

### **Course Outcomes:**

CO1: Describe the supply chain finance ecosystem

CO2: Illustrate how to assess the funding gaps in a trade cycle analysis

CO3: Apply the supply chain finance techniques in a global setting

CO4: Explain the application of FinTech in Supply Chain Finance

Role of Finance in Supply chain, Collaborative Supply Chain, Financing Supply Chain Efficiency and Firm Performance. Trade Cycle Analysis - Estimation of Working Capital in Manufacturing Vs Trading Firm. Review of Bank Finance, Trade Finance, and Instruments of Finance, Analysis and Understanding of financial statements – Case study. Supply Chain Finance Options - Options and sources of Finance - Institutional and policy framework - Institutional Finance Vs Instruments, Trade Finance, Financing Foreign Trade, Understand the Forex Risk, Assessment of Credit Gaps and Funding patterns – Case studies

EXIM Bank – Role in Promotion of exports, ECGC – Institution, services offered for export, Independent organizations to promote export – Product Specific Region Specific – Leather Export promotion council - APEDA – MPEDA, Project Export – Turnkey projects , Handling and procedure of Export documents – Factoring – Principle, Practises and relevance, Well-known Factoring companies. FEMA – its impact in regulating currency management- Fluctuations in foreign currencies –Currency convertibility – Capital/Current Accounts – Implications, NRE, NRO, FCNR, Diamond dollar accounts – components- FEDA – Role and Relevance, Derivatives – Hedging – Options under Foreign Currency – Case studies

Product Design of Finance - Cost and Benefits analysis of Supply Chain Finance arrangements and options- case study, Methodology to maximize returns by optimizing funding and borrowing -Value Creation through SCF arrangements, Legal aspects of SCF contracts. Fintech and its relevance to Supply Chain, Future of Supply Chain Finance in the Digital era, FinTech Products and Evaluation – Case analysis

### **References**

1. S. Templar, E. Hofmann, and C. Findlay. *Financing the End-to-End Supply Chain*. 2<sup>nd</sup> Edn. Kogan Page Publishers, 2020.
2. R. J. Trent. *Supply Chain Financial Management: Best Practices, Tools, and Applications for the improved Performance*. 1<sup>st</sup> Edn. Springer, 2015.
3. M. Miller, *Global Supply Chain Ecosystems: Strategies for Competitive Advantage in a complex, connected World*. 1<sup>st</sup> Edn. Kogan Page Publishers, 2015.
4. W. Tate, L. Bals, and L. Ellram. *Supply Chain Finance: Risk Management, Resilience and Supplier Management*. 1<sup>st</sup> Edn. Kogan Page Publishers, 2018.
5. J. B. Rice Jr., A. Serrano, S.D. Lekkakos, *Practical Finance for Operations and Supply Chain Management*, 1<sup>st</sup> Edn. The MIT Press, 2020.

## LS4203A INTERNATIONAL MARKETING MANAGEMENT

**Pre-requisites:** Nil

**Total Lecture Sessions:** 39

| L | T | P | O | C |
|---|---|---|---|---|
| 3 | 0 | 0 | 6 | 3 |

### **Course Outcomes:**

- CO1: Comprehend the international marketing management process
- CO2: Analyze international market segmentation, targeting, and positioning
- CO3: Explain international market entry strategies and distribution channels
- CO4: Describe the international product life cycle and export products
- CO5: Analyze international trade theories and market forces

Basic of International Marketing. International Marketing Philosophies. Difference between selling and marketing. Domestic Sales & International Sales. Reasons and benefits of Exports, and for entering International Markets. International Marketing Management Process. EPRG framework. Concept of International Business Environment.

International Market – Segmentation, Targeting & Positioning. International Marketing Entry Decisions, and Channels of Distributions. International Product Life Cycle Concept, Product and Service for Exports from India and Abroad.

Packaging – Types of packaging, Labeling & Branding. Pricing Process, Price Quotation, Transfer Pricing. Export Agency Agreements. H.S of Nomenclature & EAN barcode. International Advertising – Adaptation vs Standardization. Antimicrobial coatings, Nano sensitive labels Smart packaging, Role of Nano technology in packaging.

Service meaning & its marketing: Social, Ethical, Environmental issues in International Marketing. International Market Research Process.

Marketing Mix – 4P's of Marketing. Push and Pull Theory. WTO, Trade Blocs, Trade Barriers, Balance of Trade and Balance of Payment, and India's position. Government regulations affecting International Marketing. Government Organisations helping Exporters. Online Tools, Sites and Sources of Information an International Marketer must know (DGFT, ice gate, Ministry of Commerce etc.)

### **References:**

1. P. R. Cateora, R. B. Money, M.C. Gilly, and J. L. Graham, *International Marketing*, 18<sup>th</sup> Edition Mc Graw Hill Publishers, 2019.
2. J.K. Warren and C.G. Mark, *Global Marketing*, 9<sup>th</sup> Edition, Pearson Education, 2018.
3. J. Paul and R. Aserkar, *Export Import Management*, 2<sup>nd</sup> Edition, Oxford, 2013
4. P. Kotler, K. L. Keller, A. Chernev, J. N. Sheth, G.Shainesh, *Marketing Management*, 16<sup>th</sup> Edition, Pearson Education, 2022
5. P. Gupta, A. Aggarwal, H. Majra, I. Jacob, V. Jain, G.R. Krishna, R. Narang, S. Venkatesh, S. Paul, S. Goswami, *Marketing Management: Indian Cases*, 2<sup>nd</sup> Edition, Pearson Education, 2024.

## LS4204A CUSTOMS LAWS, PROCEDURES AND EXIM DOCUMENTATION

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 3 | 0 | 0 | 6 | 3 |

**Total Lecture Sessions:** 39

### **Course Outcomes:**

CO1: Explain the regulatory framework for export-import trade in India

CO2: Analyze international business contracts and payment terms

CO3: Perform customs valuation, assessment of goods for customs duties, and filing of import/export documentation

CO4: Describe the role of clearing and forwarding agents in the logistics of international trade

CO5: Elaborate on GST procedures and export incentive schemes

Customs Laws, Allied Acts and Procedures: Export-Import Trade: Introduction to Regulatory Framework, Export Preliminaries, Documentation Framework, International Business Contracts, Terms of Payment, Instruments of Payment & Methods of Financing Exports, Uniform Customs & Practice for Documentary Credits, Business Risk Coverage, Cargo Insurance, Foreign Exchange Regulations & Formalities, Quality Control and Pre-shipment Inspection, Role of Clearing and Forwarding Agents, Excise Clearance of Cargo, Shipment of Export Cargo, Customs Clearance of Export and Import Cargo, Negotiation of Documents with Banks, Procedures and Documentation for Availing Export Incentives, Processing of an Export Order, World Shipping, Indian Shipping, Containerisation, Machinery for Consultation, Air Transport, International Set-up.

EXIM Documentation: Need for Imports. Definition and meaning of Imports. How to read Import Export Policy and Procedures? Procedures for Imports: Import finance. Opening of Import Letter of Credit. External commercial Borrowings. Buyers Credit / Trade Credit. Direct Imports. Retirement of Import documents under an LC or otherwise on collection. Export General Manifest and Import General Manifest, Bills of Lading, Import Release Orders, Container Bonds, and IGM Submission. FEMA provision regarding Imports. Customs duties. Customs clearance of export goods. Project Imports. Role of Customs and Regulations regarding Imports Indian Customs Act. 1962. Customs Tariff Act, Filing of Bill of Entry. Clearance of cargo at the time of imports. Valuation and assessment of goods for payment of customs duty. Method for calculation of customs duty. Import of Technology, Drawings and Designs. Import of Samples / Gifts. Imports for personal use & Baggage rules. Imports through post and courier.

GST: Main provisions for Imports / Exports. Duty Exemption/ Remission schemes.

### **References:**

1. C. Rama Gopal, Export Import Procedures-Documentation and Logistics, New Age International Publishers, New Delhi, 2008
2. D.C. Kapoor, Export Management, Vikas Publishing, 2002.
3. D.C. Gardener, Documentary Credits, Macmillan India, 1998.
4. Government of India, A Handbook of Procedures.
5. Paras Ram, Export: What, Where, How, Anupam Publishers, Delhi.

## LS4205A TRANSPORTATION PLANNING AND OPERATIONS

**Pre-requisites: Nil**

**Total Lecture Sessions: 39**

| L | T | P | O | C |
|---|---|---|---|---|
| 3 | 0 | 0 | 6 | 3 |

### **Course Outcomes:**

- CO1: Explain the importance of transportation in a supply chain.
- CO2: Identify the suitable transport mode for a particular context.
- CO3: Describe the role of various stakeholders in transportation management.
- CO4: Apply decision-making tools and techniques for transportation planning and management.
- CO5: Explain the sustainability concept in transportation and the evolution of ITS.

Need for transportation; Freight transportation; Transport operator decisions; Modes of transportation and their performance characteristics; Road freight transportation - Trucking, LTL/FTL shipments; Rail freight transportation - freight consolidation and full train loads; International Air Cargo Transport - types of freight rates; Water transport; Multimodal freight transportation - planning and operations; Transportation infrastructure and policies; Containerisation: concept, benefits and limitations; Inland Container Depot (ICD); CONCOR. Materials Handling and their systems- Material handling equipment, AGVS.

Transportation network design; Hub and Spoke Networks; Storage and warehousing; Economics of transportation; Economic batch size of movement; Basic transportation problem; Shortest path problem; Vehicle scheduling; Vehicle routing; Crew planning problem; Last-mile, first-mile and long-haul transportation; Urban transportation; Freight Forwarders and NVOCC; Third-party logistics; Sustainable transportation; Intelligent transport systems (ITS).

### **References**

1. S. Chopra and P. Meindl, Supply Chain Management: Strategy, Planning, and Operation. Pearson Prentice Hall of India, 2016.
2. Rushton, A., Croucher, P., & Baker, P. (2022). *The handbook of logistics and distribution management: Understanding the supply chain*. Kogan Page Publishers.
3. Gleissner, H., Femerling, J. C., Gleissner, H., & Femerling, J. C. (2013). Logistics Systems. *Logistics: Basics—Exercises—Case Studies*, 19-35.
4. Wells, A. T. (2007). *Air transportation: A management perspective*. Ashgate Publishing, Ltd.
5. Chapter 6: Application of Network Models from Urban Operations Research (1981) by Larson, R. C., & Odoni, A. R. Link: [https://web.mit.edu/urban\\_or\\_book/www/book/](https://web.mit.edu/urban_or_book/www/book/) (UOR)
6. Rangaraj, N., Raghuram, C., & Srinivasan, M. M. (2009). Supply Chain Management for Competitive Advantage, Concepts and Cases.

## LS4106A FUNDAMENTALS OF GEOGRAPHY

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 2 | 0 | 0 | 4 | 2 |

**Total Lecture Sessions:** 26

### **Course Outcomes:**

CO1: Demonstrate the importance of Geography in logistics and supply chain contexts

CO2: Distinguish the various global economic zones and their influence on global trade and supply chains.

CO3: Examine the geopolitics and global trade in logistics and supply chain contexts

CO4: Appraise about the customs, tariffs and trade regulations

CO5: Apply Geographic Information Systems (GIS) in logistics and supply chain problems

Introduction to Geography - Definition and Importance of Geography, Branches of Geography: Geographic Tools and Technologies: Maps, GPS, GIS. Earth's Structure and Landforms, Climate and Weather Patterns, Impact of Physical Geography on Supply Chains.

Population Distribution and Demographics, Global Economic Zones, Transportation Networks and Infrastructure, Geographical Challenges in Transportation, Major Global Trade Routes, Global Trade and Commerce, Regional Economic Integration, Trade Blocs and Agreements (e.g., NAFTA, EU, ASEAN), Impact of Economic Geography on Supply Chains

Political Boundaries and Borders, Geopolitics and Global Trade, Customs, Tariffs, and Trade Regulations, Impact of Political Geography on Supply Chains.

Geographic Information Systems (GIS) in Supply Chain - Introduction to GIS and Its Applications, Spatial Analysis for Supply Chain Optimization, Case Studies: GIS in Logistics and Transportation, Practical Exercises with GIS Tools

### **References:**

1. H. J. de Blij and P.O.Muller, Geography: Realms, Regions and Concepts, John Wiley 2020
2. P. Knox, J. Agnew, and L.Mccarthy, The Geography of the World Economy, Routledge, 2008.
3. K-T Chang, Introduction to Geographic Information Systems, McGraw Hill Education, 2017.
4. M.J.De Smith, M.F. Goodchild, and P.Longley, Geospatial Analysis: A Comprehensive Guide to Principles, Techniques and Software tools, Matador 2007.

## LS4107A MATHEMATICS AND MEASUREMENTS FOR TRADE

**Pre-requisites:** Nil

| L | T | P | O | C |
|---|---|---|---|---|
| 2 | 0 | 0 | 4 | 2 |

**Total Lecture Sessions:** 26

### **Course Outcomes:**

CO1: Illustrate the arithmetic operations required in the context of logistics and supply chain

CO2: Distinguish the measurement systems and units associated with logistics operations

CO3: Utilize the technology in measurements for trade

CO4: Apply data analysis and data visualization tools for decision making

Revision on Arithmetic Operations, Percentages, Ratios and Proportions, Basic Algebraic Concepts.

Measurement Systems and Units - Standard Units of Measurement: Metric and Imperial Systems, Converting Units of Measurement, Linear measurements, Weight measurements, Temperature measurements, Pressure measurements, Common Measurements in Supply Chain: Perimeter, Area, Volume and Weight measurements. Accuracy and Precision in Measurements, Transportation and Logistics Mathematics - Distance and Time Calculations.

Use of Technology in Measurements - Introduction to Measurement Tools and Technologies, Barcodes and RFID in Inventory Management, GPS and Telematics in Transportation.

Overview of Data Analysis and Statistics - Descriptive Statistics: Mean, Median, Mode, Standard Deviation and Variance, Probability Concepts, Basic Data Visualization Tools and use of spreadsheets for calculation and analysis. Load Planning, Fuel Consumption and Cost Analysis

### **References:**

1. J. Lambert and C. Frye, Microsoft Excel 2016 Step by Step (Office 2021 and Microsoft 365), Microsoft Press, 2021.
2. D.M. Levine, D.F. Stephan, and K.A. Szabat, Statistics for Managers, Using Microsoft Excel, Pearson Education, 2017.
3. M. Christopher, Logistics and Supply Chain Management, FT Publishing International, 2016.
4. C. Flinn and M. Overgaard, Math for Trades: Volume 2, BCcampus, 2021
5. R.A. Carman and H.M. Saunders, Mathematics for the Trades: A guided approach, Pearson, 2011.

## LS4108A COMMUNICATIVE ENGLISH

| L | T | P | O | C |
|---|---|---|---|---|
| 1 | 0 | 0 | 2 | 1 |

**Pre-requisites:** Nil

**Total Lecture Sessions:** 13

### **Course Outcomes:**

CO1: Demonstrate proficiency in various communication formats, adapting to different audiences and purposes.

CO2: Collaborate effectively in group settings and build strong interpersonal relationships.

CO3: Understand and navigate intercultural communication challenges

### **Types and Styles of Communication**

General Communication v/s Technical Communication–Basic Documents: Resumes, Cover Letters, CV, Statement of Projects, Correspondence – Oral Presentations: Presentation Style, Graphics In Presentation, Team Presentations– Peer Feedback

### **Impactful Communication**

Persuasive Communication – Authoritative Writing And Speaking – Impromptu Speaking and Presentation – Communication and Leadership

### **Communicating beyond borders**

Communication Across Cultures–Communicating with Diverse Audiences – Inclusive Communication–Ethical Considerations in Communication–Strategies and Approaches in Communication

### **References:**

1. Hamilton, L. (2014). Guide To Managerial Communication : Effective Business Writing And Speaking (10th Ed.). Pearson.
2. Holtz, Shel. Corporate Conversations. New Delhi: PHI. 2007.
3. Tuhovsky, Ian . (2015) Communication skills training: a practical guide to improving your social intelligence, presentation, persuasion and public speaking skill. CreateSpace Independent Publishing Platform.
4. Whitcomb, C. A., & Whitcomb, L. E. (2013). Effective Interpersonal And Team Communication Skills For Engineers. IEEE Press ; John Wiley & Sons.

## LS4209A INTERNSHIP

**Pre-requisites: Nil**

| L | T | P | O | C |
|---|---|---|---|---|
| 0 | 0 | 0 | * | 2 |

**Course Outcomes:**

CO1: Understand the working culture of an industry, operating in International Trade.

CO2: Work on challenging real-life projects, under the guidance from experienced professionals.

CO3: Develop soft skills like communication and teamwork.

CO4: Carry out interactions with society, which would help in their professional career.

CO5: Prepare a technical report and presentation on the work done

An internship with a total duration of 4-6 weeks after the completion of classes is mandatory. It should preferably be done in an Industry in the field of Trade. The objective of the course is to enable the students to develop work culture, attitudes, as well as, communication and interpersonal skills necessary for job success. The students are made proficient to make proper technical documentation on the work done. Moreover, the course would train the students to make effective technical presentations. Evaluation of the work done and awarding the credit for the same are to be done on successful completion of the internship and submission of report.

\*To be decided by the organisation in which the internship is done