Supply Chain Management and Engineering Training Course

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Course Overview:

The Supply Chain Management and Engineering Training Course provides a structured, practical approach to designing, managing, and improving complex supply networks. It integrates the managerial principles of Integrated Supply Chain Management with the analytical methods used in Supply Chain Systems Engineering, enabling participants to examine supply chains as interconnected systems of suppliers, production facilities, warehouses, transport operations, information flows, and customers.

The course draws on established developments in Supply Chain Design and Management, including RFID applications, mobile and sensor technologies, agent-based systems, reverse logistics, lean supply chains, decentralized planning, Vendor-Managed Inventory, uncertainty management, network robustness, and available-to-promise processes. These themes reflect the book’s division between emerging technologies and advanced methodologies for supply chain design and management.

Participants will also explore contemporary Digital Supply Chain Technologies, including artificial intelligence, the Internet of Things, blockchain, cloud computing, smart manufacturing, big data analytics, digital twins, and real-time decision-support systems. The course connects these technologies with Supply Chain Optimization, Logistics Network Design, resilience, sustainability, and performance improvement. The accompanying paper further highlights the transition from traditional supply chains toward Supply Chain 4.0 and increasingly human-centred, sustainable Supply Chain 5.0 models.

Through practical exercises and structured analysis, participants will develop actionable capabilities in Supply Chain Network Design, Supply Chain Modeling and Analysis, planning, control, risk management, and engineering-based decision-making.

Target Audience:

- Supply Chain Managers and Directors
- Supply Chain Engineers and Industrial Engineers
- Logistics and Distribution Managers
- Operations and Manufacturing Managers
- Procurement and Strategic Sourcing Professionals
- Demand, Inventory, and Production Planners
- Warehouse and Transportation Managers
- Supply Chain Analysts and Business Analysts
- Continuous Improvement and Operational Excellence Professionals
- Digital Transformation and Industry 4.0 Specialists
- Risk, Resilience, and Business Continuity Professionals
- Consultants involved in Supply Chain Design and Optimization

Targeted Organizational Departments:

- Supply Chain Management
- Logistics and Distribution
- Operations and Manufacturing
- Procurement and Strategic Sourcing
- Inventory and Materials Management
- Production Planning and Control
- Transportation and Fleet Management
- Warehousing and Fulfilment
- Industrial and Systems Engineering
- Digital Transformation and Information Technology
- Operational Excellence and Process Improvement
- Enterprise Risk and Business Continuity
- Sustainability and Circular Economy
- Data Analytics and Performance Management

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Targeted Industries:

- Manufacturing and Industrial Production
- Automotive and Aerospace
- Oil, Gas, Petrochemical, and Energy
- Pharmaceuticals and Healthcare
- Food, Beverage, and Fast-Moving Consumer Goods
- Retail, E-commerce, and Wholesale Distribution
- Transportation, Shipping, and Freight Forwarding
- Ports, Aviation, and Maritime Logistics
- Construction and Engineering
- Electronics and Semiconductor Manufacturing
- Government and Public-Sector Supply Networks
- Telecommunications and Technology
- Mining and Natural Resources
- Humanitarian and Emergency Logistics
- Third-Party Logistics and Supply Chain Consulting

Course Offerings:

By the end of this course, participants will be able to:

- Explain the principles of Supply Chain Management and Engineering.
- Map product, information, and financial flows across integrated supply networks.
- Apply Supply Chain Systems Engineering principles to complex operational problems.
- Design and evaluate Supply Chain Network Design alternatives.
- Analyse suppliers, factories, warehouses, distribution centres, and transport links.
- Apply Supply Chain Modeling and Analysis to planning and decision-making.
- Compare lean, agile, global, green, digital, and resilient supply chain models.
- Improve inventory, transportation, production, and distribution coordination.
- Evaluate RFID, sensors, IoT, AI, blockchain, cloud platforms, and digital twins.
- Use Supply Chain Optimization concepts to balance service, cost, capacity, and risk.
- Develop reverse logistics and circular supply chain network concepts.
- Analyse decentralized planning, collaboration, negotiation, and Vendor-Managed Inventory.
- Assess supply uncertainty and strengthen Supply Chain Risk and Resilience.
- Establish Supply Chain Performance Management indicators and dashboards.
- Prepare a practical Supply Chain Design and Optimization improvement roadmap.

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Training Methodology:

This Supply Chain Management Training Course uses an applied learning methodology that combines technical explanation with structured workplace practice. Instructor-led sessions introduce Supply Chain Design and Management concepts, followed by guided exercises that allow participants to apply each method to realistic supply network situations.

Case studies are used to examine RFID implementation, inventory visibility, mobile event management, reverse logistics, lean supply chains, production-distribution models, decentralized planning, Vendor-Managed Inventory, uncertainty, and network robustness. These areas reflect the technology and methodology themes presented in the reference book.

Participants will work in groups to map supply networks, identify critical nodes, analyse logistics flows, compare alternative network configurations, and evaluate cost-service-risk trade-offs. Short modelling exercises will demonstrate how data, assumptions, constraints, and performance measures influence supply chain decisions.

Interactive sessions will also address Supply Chain Technology and Innovation, including AI, IoT, blockchain, smart manufacturing, cloud computing, analytics, digital twins, and real-time decision-support systems. The second reference emphasises digitisation, smart manufacturing, and big data analytics as central pillars of Supply Chain 4.0.

Daily reflection sessions consolidate key lessons, while peer discussions and facilitator feedback help participants convert technical concepts into practical Supply Chain Process Improvement initiatives for their organisations.

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Course Toolbox:

Participants will receive guidance, examples, and demonstration materials relevant to:

- Supply chain mapping framework
- Supply chain node-and-flow analysis template
- Supply Chain Network Design canvas
- Logistics Network Design comparison matrix
- Supplier, production, warehouse, and distribution mapping template
- Inventory policy analysis guide
- Transportation cost and routing analysis example
- Vendor-Managed Inventory scenario template
- Reverse logistics network design framework
- Supply chain uncertainty register
- Risk and resilience assessment checklist
- Network robustness evaluation model
- Supply chain performance scorecard
- KPI selection and dashboard framework
- Digital supply chain maturity assessment
- Technology evaluation matrix for RFID, IoT, AI, blockchain, and digital twins
- Supply Chain Optimization decision worksheet
- Available-to-promise process analysis example
- Supply chain improvement roadmap template

These tools are not provided as licensed commercial software. The course provides practical insights, demonstrations, templates, and examples of tools and technologies relevant to Supply Chain Management and Engineering.

Course Agenda:

Day 1: Integrated Supply Chain Management and Systems Engineering

- **Topic 1:** Fundamentals of Supply Chain Management and Engineering
- **Topic 2:** Product, Information, and Financial Flows
- **Topic 3:** Supply Chain Systems Engineering Principles
- **Topic 4:** Mapping End-to-End Supply Chain Networks
- **Topic 5:** Lean, Agile, Global, and Integrated Supply Chains
- **Topic 6:** Supply Chain Strategy, Cost, Service, and Value
- **Reflection & Review:** Reviewing supply chain structures, flows, stakeholders, and systems-level improvement opportunities

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Day 2: Supply Chain Design, Network Modelling, and Optimization

- **Topic 1:** Supply Chain Design and Management Decisions
- **Topic 2:** Supply Chain Network Design Principles
- **Topic 3:** Logistics Network Design and Facility Location
- **Topic 4:** Supply Chain Modeling and Analysis
- **Topic 5:** Production and Distribution Network Alternatives
- **Topic 6:** Supply Chain Optimization and Trade-Off Analysis
- **Reflection & Review:** Comparing network configurations using cost, capacity, service, flexibility, and risk criteria

Day 3: Planning, Inventory, Transportation, and Collaboration

- **Topic 1:** Supply Chain Planning and Control
- **Topic 2:** Demand, Capacity, and Production Coordination
- **Topic 3:** Inventory Management and Replenishment Policies
- **Topic 4:** Transportation Integration and Logistics Planning
- **Topic 5:** Vendor-Managed Inventory and Collaborative Planning
- **Topic 6:** Decentralized Supply Chain Decision-Making
- **Reflection & Review:** Evaluating coordination gaps across planning, inventory, transport, suppliers, and customers

Day 4: Digital Supply Chain Technologies and Smart Operations

- **Topic 1:** Digital Supply Chain Technologies and Industry 4.0
- **Topic 2:** RFID, Auto-ID, Sensors, and Real-Time Visibility
- **Topic 3:** IoT, Cloud Computing, and Connected Supply Networks
- **Topic 4:** Artificial Intelligence and Big Data Analytics
- **Topic 5:** Blockchain, Traceability, and Secure Information Sharing
- **Topic 6:** Digital Twins, Simulation, and Smart Manufacturing
- **Reflection & Review:** Assessing digital technology applications, requirements, limitations, and organisational readiness

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Day 5: Resilience, Sustainability, and Performance Improvement

- **Topic 1:** Supply Chain Risk and Resilience
- **Topic 2:** Supply Uncertainty and Network Robustness
- **Topic 3:** Reverse Logistics and Circular Supply Chains
- **Topic 4:** Green, Sustainable, and Human-Centred Supply Chains
- **Topic 5:** Supply Chain Performance Management and KPIs
- **Topic 6:** Supply Chain Process Improvement Roadmap
- **Reflection & Review:** Developing priorities for a resilient, digital, sustainable, and high-performing supply chain

FAQ:

What specific qualifications or prerequisites are needed for participants before enrolling in the course?

No formal qualifications are required. However, participants will benefit from basic experience in supply chain management, logistics, operations, manufacturing, procurement, inventory management, industrial engineering, or business analysis. Familiarity with operational data, process mapping, or performance indicators will support participation in the course exercises.

How long is each day's session, and is there a total number of hours required for the entire course?

Each day's session is generally structured to last around 4–5 hours, with breaks and interactive activities included. The total course duration spans five days, approximately 20–25 hours of instruction.

What is the difference between supply chain management and supply chain engineering?

Supply chain management focuses on coordinating sourcing, production, inventory, logistics, information, and customer delivery activities. Supply chain engineering applies systems thinking, modelling, optimization, simulation, network design, data analysis, and technology evaluation to improve how these activities are structured and controlled. This course integrates both perspectives so participants can manage current operations while also redesigning supply networks for better cost, service, resilience, and performance.

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How This Course is Different from Other Supply Chain Management and Engineering Courses:

This course differs from conventional supply chain programmes by integrating operational management, engineering analysis, network design, digital technology, and resilience within one structured learning journey. Rather than treating procurement, logistics, inventory, production, and distribution as isolated functions, it examines the supply chain as an interconnected technical and managerial system.

The course draws directly on technology themes such as RFID, mobile information systems, sensors, and agent-based supply chain management. It also incorporates methodology themes including reverse logistics design, lean supply chains, decentralized planning, dynamic lot-sizing, Vendor-Managed Inventory, supply uncertainty, network robustness, and available-to-promise management.

It extends these foundations by examining Supply Chain 4.0 technologies, including AI, IoT, blockchain, smart manufacturing, cloud computing, big data analytics, and digital twins. Participants also consider the emerging Supply Chain 5.0 emphasis on human-centred operations, sustainability, ethical governance, and societal value.

The programme therefore moves beyond descriptive supply chain theory. Participants practise mapping networks, evaluating design alternatives, analysing operational trade-offs, assessing digital readiness, strengthening resilience, selecting performance indicators, and developing an actionable improvement roadmap. This combination makes the course suitable for both supply chain managers and engineering-oriented professionals responsible for transforming complex supply networks.

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Training Course Categories

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- Finance and Accounting Training Courses
- Governance, Risk and Compliance Training Courses
- Human Resources Training and Development Courses
- IT Security Training & IT Training Courses
- Leadership and Management Training Courses
- Legal Training, Procurement and Contracting Courses
- Maintenance Training and Engineering Training Courses
- Marketing, Customer Relations, and Sales Courses
- Occupational Health, Safety and Security Training Courses
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