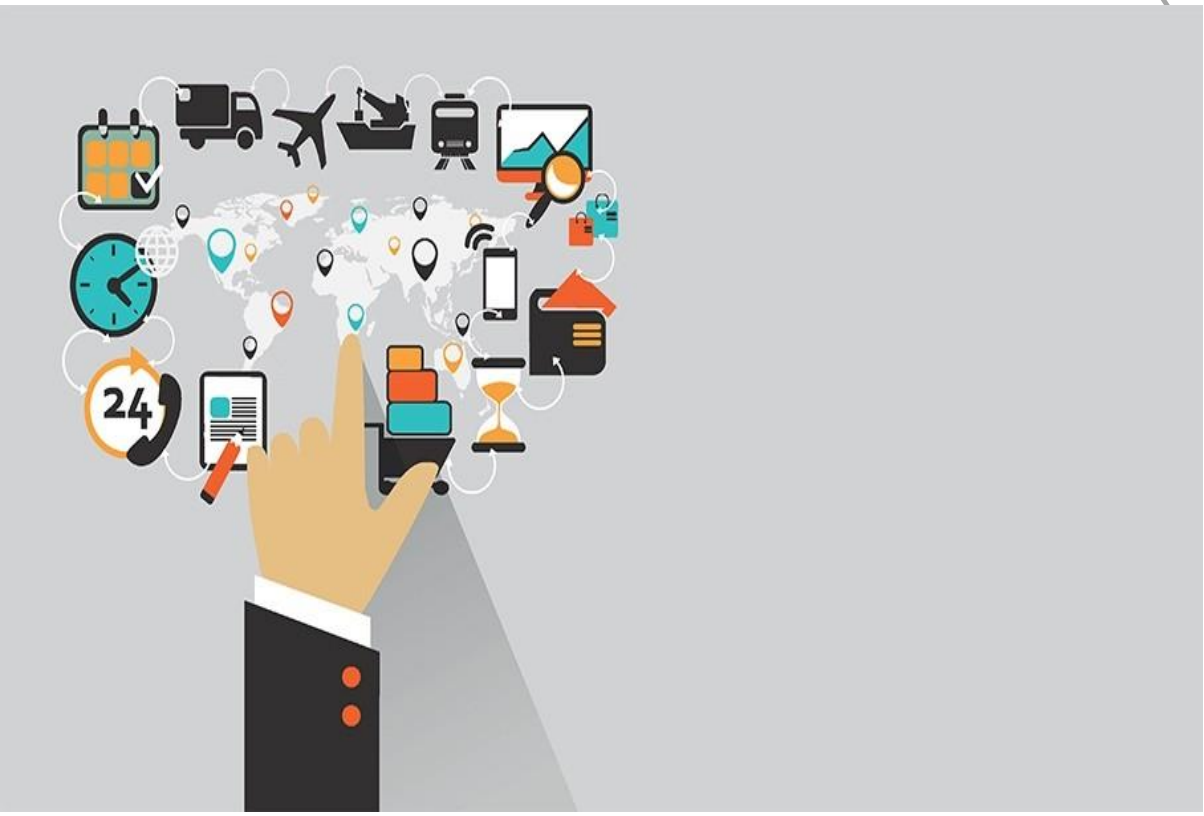
Asia Masters Center

Distribution Logistics



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Distribution Logistics

Course Objective

- Improve and evaluate products and production processes in order to attain and maintain a competitive edge.
- Pursue and achieve a great delivery capability and reliability with the lowest possible logistic and production costs.
- Depict the extent to which the promised dates for the placed orders can be met.
- Explain why the marketable production costs, delivery capability and delivery reliability are critical to a company's long-term market success.
- Monitor the interactions between the performance and cost objectives constantly so as to ensure the production's economic efficiency.
- Clearly demonstrate the mutual dependencies between the often contradictory logistic objectives.

Target Audience

- This course will mainly benefit to purchasing managers, senior buyers, project managers, civil engineers, construction managers, contractors, sub-contractors, site engineers, senior management, and government agencies, architects, construction professionals,

and anyone responsible for purchasing at a senior level who seeks to enhance their skills further.

Course Outline

Day 1

Supply chain management

- What do we mean by logistics?
- Plan of the chapter.
- Structure of production/distribution networks.
- Competition factors, cost drivers, and strategy.
- Competition factors.
- Cost drivers.
- Strategy.
- The role of inventories.
- A classical model: Economic Order Quantity.
- Cycle vs. capacity-induced stock.
- Dealing with uncertainty.
- Setting safety stocks.
- A two-stage decision process: Production planning in an assemble-to-order environment.
- Inventory deployment.
- Physical flows and transportation.
- Time horizons and hierarchical levels.
- Decision approaches.
- Information flows and decision rights.
- Quantitative models and methods.
- For further reading.
- Network Design and Transportation
- The role of intermediate nodes in a distribution network.

- The risk pooling effect: reducing the uncertainty level.
- The role of transit points in transportation optimization.
- Location and flow optimization models.
- The transportation problem
- The minimum cost flow problem.
- The plant location problem
- Putting it all together
- Models involving nonlinear costs.
- For Further Reading.

Day 2

Forecasting

- Overview on forecasting.
- The variable to be predicted.
- The forecasting process.
- Metrics for forecast errors.
- The Mean Error.
- Mean Absolute Deviation.
- Root Mean Square Error.
- Mean Percentage Error and Mean Absolute Percentage Error.
- ME%, MAD%, RMSE%.
- U Theil's statistic.
- Using metrics of forecasting accuracy.
- A classification of forecasting methods
- Moving Average
- The demand model.
- The algorithm.
- Setting the parameters.
- Drawbacks and limitations.
- Simple exponential smoothing.
- The demand model.
- The algorithm.

- Setting the parameter.
- Initialization.
- Drawbacks and limitations.
- Exponential Smoothing with Trend.
- The demand model.
- The algorithm.
- Setting the parameters.
- Initialization.
- Drawbacks and limitations.
- Exponential smoothing with seasonality.
- The demand model.
- The algorithm.
- Setting the parameters.
- Initialization.
- Drawbacks and limitations.
- Smoothing with seasonality and trend.
- The demand model.
- The algorithm.
- Initialization.
- Simple linear regression.
- Setting up data for regression.
- Forecasting new products.
- The Delphi method and the committee process.
- Lancaster model: forecasting new products through products features.
- The early sales model.
- The Bass model.
- Limitations and drawbacks.

Day 3

Inventory management with Deterministic Demand

- Economic Order Quantity.

- Robustness of EOQ model.
- Case of LT > 0: the (Q,R) model.
- Case of finite replenishment rate.
- Multi-item EOQ.
- The case of shared ordering costs.
- The multi-item case with a constraint on ordering capacity.
- Case of nonlinear costs.
- The case of variable demand with known variability.
- Inventory control: the stochastic case.
- The newsvendor problem.
- Extensions of the Newsvendor problem.
- Multi-period problems.
- Fixed quantity: the (Q,R) model.
- Optimization of the (Q,R) model in case the stock out cost depends on the size of the stock out.
- (Q,R) system: case of constraint on the type II service level.
- Optimization of the (Q,R) model in case the cost of a stock-out depends on the occurrence of a stock out.(Q,R) system: case of constraint on type I service level.
- Periodic review: S and (s, S) policies.
- The S policy.
- The (s, S) policy.
- Managing inventories in multiechelon supply chains
- Managing multi-echelon chains: Installation vs. Echelon Stock.
- Features of Installation and Echelon Stock logics.
- Coordination in the supply chain: the Bullwhip effect.
- A linear distribution chain with two echelons and certain demand.
- Arbores cent chain with two echelons: transit point with uncertain demand.
- A two echelon supply chain in case of stochastic demand.

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Day 4

Incentives in the supply chain

- Decisions on price: double marginalization.
- The first best solution: the vertically integrated firm.
- The vertically disintegrated case: independent manufacturer and retailer.
- A way out: designing incentive schemes.
- Decision on price in a competitive environment.
- The vertically disintegrated supply chain: independent manufacturer and retailer.
- Decision on inventories: the Newsvendor problem.
- The first best solution: the vertically integrated firm.
- The vertically disintegrated case: independent manufacturer and retailer.
- A way out: designing incentives and re-allocating decision rights.
- Decision on effort to produce and sell the product.
- The first best solution: the vertically integrated firm.
- The vertically disintegrated case: independent retailer and manufacturers.
- The case of efforts both at the upstream and downstream stage.

Day 5

Vehicle Routing

- Network routing problems.
- Solution methods for symmetric TSP.
- Nearest-neighbor heuristic.
- Insertion-based heuristics.
- Local search methods.
- Solution methods for basic VRP.
- Constructive methods for VRP.
- Decomposition methods for VRP: cluster first, route second.
- Additional features of real-life VRP.

- Constructive methods for the VRP with time windows.

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