

INVENTORY & PRODUCTION MANAGEMENT

Introduction to inventory systems, Selective inventory classification and its use in controlling inventory.

Deterministic inventory models: Economic order quantity (EOQ) model, EOQ with finite supply, EOQ with backorders, EOQ with constraints, All-units quantity discounts model.

Probabilistic inventory models: Single period probabilistic inventory models with discrete and continuous demand.

Determination of reorder point for deterministic and probabilistic inventory system.

Production management: Introduction to Production Planning and Scheduling, Aggregate production plan, Formulation of lot size production problem: Wagner and Whitin algorithm. Basic concepts of Just-in-Time (JIT) and Material Requirement Planning (MRP).

WEEK – WISE LAYOUT

Introduction to inventory systems. Selective inventory classification and its use in controlling inventory.

[1] Chapter 1: Pages 3-30; Chapter 2: Pages 31-60; Chapter 6: Pages 207-211.

Deterministic inventory models: Economic order quantity (EOQ) model, EOQ with finite supply, EOQ with backorders.

[1] Chapter 3: Pages 65-98; Chapter 4: Pages 113-128.

EOQ with constraints.

[1] Chapter 4: Pages 128-134.

All-units quantity discounts model.

[1] Chapter 4: Pages 99-112.

Probabilistic inventory models: Single period probabilistic inventory models with discrete and continuous demand.

[1] Chapter 5: Pages 147-170.

Determination of reorder point for deterministic and probabilistic inventory system.
[1] Chapter 5: Pages 170-191.

Production management: Introduction to Production Planning and Scheduling, Aggregate production plan, Formulation of lot size production problem: Wagner and Whitin algorithm.

[2] Chapter 18: Pages 848-852.

Basic concepts of Just-in-Time (JIT) and Material Requirement Planning (MRP).
[1] Chapter 10: Pages 341-373.

Text Book Readings:

1. **Donald Waters:** Inventory Control, John Wiley, 2010.
2. **F.S. Hillier and G.J. Lieberman:** Introduction to Operations Research- Concepts and Cases, 9th Edition, Tata McGraw Hill, 2010

Additional Readings:

1. **G. Hadley, T. M. Whitin:** Analysis of Inventory- Systems, D. B. Taraporevala and Sons, Published by arrangement with Prentice Hall Inc., 1979.
2. **Buffa, Elwood S. and Sarin Rakesh K.,** Modern Production / Operations Management, 8th Edition, Wiley India, 2009.

LIST OF PRACTICALS

1. Problems based on selective inventory classification (ABC and FNS analysis).
2. To find optimal inventory policy for EOQ model.
3. To find optimal inventory policy for EPQ model.
4. To find optimal inventory policy for EOQ model with backorders.
5. To solve EOQ model with constraints.
6. To solve All-units quantity discounts model.
7. To find optimal inventory policy for Probabilistic inventory model with discrete demand.
8. To find optimal inventory policy for Probabilistic inventory model with continuous demand.
9. Solution of procurement/production scheduling model.

NOTE: Practicals are to be performed using software: Excel-solver, LINDO, LINGO, Mathematica and any open source software on Inventory Management, TORA, etc.