

IE460 – Fall 2023
Bilkent University, IE Department
Detailed Course Outline + Required and Optional Reading Material
UPDATED November 2nd, 2023

Edition 6 – Chopra and Meindl (2016)

Edition 7 – Chopra (2019)

Review: In both editions (6 and 7) - Chapters 7-8-9 (IE375 Material)

Read Chapter 11, in both editions, in detail (First four subsections, currently) before solving your homework. The way things are described may be a bit different than your previous text-books (IE375).

1. Introduction

Required Reading: Chapter 1-3, Both Editions

Optional (IE375 Material) Reading: Chapter 4, Chapter 2 – 2.11, 2.13 - Nahmias (2015)

2. Issues of Cycle Inventory - Review (ABC Analysis, EOQ), Joint Replenishment Problem, Multi-Echelon Inventory Problem under Continuous Review (Two-Stage), Price Discounting

Required Reading: Chapter 11, Both Editions

Optional Reading: Chapter 5 and Chapter 12.1-12.3, Silver et al (1998)

Optional Reading: Optional Reading: Monahan (1984) – “Quantity Discount Pricing Model to Increase Vendor Profits”, *Management Science*, Volume 30, Number 6, pp. 720-726, 1984 (pdf available at the course WEB page)

3. Issues of Optimal Inventory under Uncertainty – Review (Newsvendor Problem)

Contracting structures and Coordination issues – Application to the single-period, stochastic demand environment

Required Reading: Chapter 13 and Chapter 15.1, Both Editions

Optional (IE375 Material) Reading: Chapter 5 - Nahmias (2015)

Optional Reading (IE375 related material) Reading: Chapters 7-10, Silver et al (1998)

Optional Reading: Remaining parts of Chapter 15, Both Editions

Required Reading: Reading: Pasternack, B. A., “Optimal pricing and return policies for perishable commodities”, *Marketing Science*, 4, 166-176 (1985) (pdf available at the course WEB page)

4. Transportation issues in Supply Chain.

Required Reading: Chapter 14, Both Editions

Optional Reading: Lee, C., “The Economic Order Quantity for Freight Discount Costs”, *IIE*, 318-320 (1986).

5. Issues of inventory aggregation – Risk-pooling, Advantages of Centralization, Distribution Systems

Required Reading: Chapter 12, Both Editions

Optional Reading: Eppen, G. P., “Effects of centralization on expected costs in a multi-location newsboy Problem”, *Management Science*, 25, pp. 498-501, (1979) (pdf available at the course WEB page)

6. Bullwhip effect

Required Reading: Chapter 10, Both Editions

Optional Reading: Chapter 17, Both Editions

Optional Reading: Lee, H.L. Padmanabhan, V. and Whang, S., “Information Distortion in a Supply Chain: The Bullwhip Effect”, *Management Science*, Vol: 43, No: 4, 1997, pp. 546-558 (pdf available at the course WEB page)

7. Inventory Positioning - Multi-Echelon Stochastic Inventory Problem under Continuous Review

Required Reading: Chapter 12, Both Editions

Optional Reading: Chapter 12.4, Silver et al (1998)

Optional Reading: Snyder, L. V. (2023). Stockpyl: A Python Package for Inventory Optimization and Simulation. In *Tutorials in Operations Research: Advancing the Frontiers of OR/MS: From Methodologies to Applications* (pp. 156-197). INFORMS.

Optional Reading: Urlu, B., Erkip, N.K. Safety stock placement for serial systems under supply process uncertainty. *Flex Serv Manuf J* **32**, 395–424 (2020).

Optional Reading: Gullu, R., Onol, E. and Erkip, N. "Analysis of a Deterministic Demand Production/Inventory System Under Nonstationary Supply Uncertainty", *IIE Transactions*, Volume: 29, No: 8, pp. 703-709, 1997.

8. Designing Supply Chains

Required Reading: Chapter 5 Both Editions

Optional Reading: Chapter 6, Both Editions

Required Reading: Nozick, L.K. and Turnquist, M.A., “Inventory, Transportation, Service Quality and the Location of Distribution Centers”, *EJOR*, Vol: 129, 2001, pp. 362-371 (pdf available at the course WEB page)

9. Issues of Postponement

Required Reading: Chapter 12 and Chapter 13, related pages, Both Editions

Chopra and Meindl (2016) – Chopra, S., and Meindl, P., *Supply Chain Management: Strategy, Planning and Operation*, Prentice Hall, 6th Global Edition, 2016.

Chopra (2019) - *Supply Chain Management: Strategy, Planning and Operation*, Prentice Hall, 7th Global Edition, 2019.

Nahmias (2015) – Nahmias, S. and Olsen, T., *Production and Operation Analysis*, 7th edition, Waveland Press, 2015 or 6th edition – McGraw Hill, 2009.

Silver et al (1998) – Silver, E.A., Pyke, D., and Peterson, R., *Inventory Management and Production Planning and Scheduling*, John Wiley, 1998, 3rd Edition (available at the library) or similar chapters in Silver, E.A., Pyke, D., and Thomas, D.J., *Inventory and Production Management in Supply Chains*, 4th Edition, CRC Press, 2016 ((available at the library)