

Recommended Reading

- Altay, N., & Lewis, A. (2011). *Service parts management: Demand forecasting and inventory control*. New York: Springer.
- Bedworth, D. D., & Bails, J. (1987). *Integrated production control systems, analysis design*. New York: Wiley.
- Brown, R. G. (1959). *Statistical forecasting for inventory control*. New York: McGraw Hill.
- Brown, R. G. (1962). *Smoothing, forecasting and prediction of discrete time series*. Englewood Cliffs, NJ: Prentice Hall.
- Chase, C. W. (2013). *Demand driven forecasting*. New York: Wiley and SAS Business Series.
- Chase, R. B., & Aquilano, N. J. (1989). *Production and operations management: A life cycle approach*. Homewood, IL: Irwin.
- Chisholm, R. K., & Whitaker, G. R. (1971). *Forecasting methods*. Homewood, IL: Irwin.
- Chow, W. (1990). *Assembly line design methodology and applications*. New York: CRC Press.
- Doty, L. (1996). *Statistical process control*. South Norwalk, CT: Industrial Press.
- Elsayed, E. A., & Boucher, T. O. (1985). *Analysis and control of production systems*. Englewood Cliffs, NJ: Prentice Hall.
- Groover, M. P. (2001). *Automation, production systems and computer integrated manufacturing*. Englewood Cliffs, NJ: Prentice Hall.
- Groover, M. P. (2010). *Fundamentals of modern manufacturing*. New York: Wiley.
- Holt, C. C., Modigliani, F., Muth, J. F., & Simon, H. A. (1960). *Planning production inventories and work force*. Englewood Cliffs, NJ: Prentice Hall.
- Hong, W. C. (2013). *Intelligent energy demand forecasting*. New York: Springer.
- Lambert, A. J. D., & Gupta, S. M. (2005). *Disassembly modeling for assembly, maintenance, reuse, and recycling*. Boca Raton, FL: CRC Press.
- Lewis, C. (1997). *Demand forecasting and inventory control*. New York: Wiley.
- Makridakis, S., & Wheelwright, S. C. (1977). *Interactive forecasting*. San Francisco: Holden-Day.
- Makridakis, S., & Wheelwright, S. (1978). *Time-series forecasting: Methods and applications*. New York: Wiley.
- McGovern, S. M., & Gupta, S. M. (2011). *The disassembly line: Balancing and modeling*. New York: McGraw Hill.
- Minner, S. (2000). *Strategic safety stocks in supply chains*. New York: Springer.
- Montgomery, D. C., Jennings, C. L., & Kulahci, M. (2008). *Introduction to time series analysis and forecasting*. New York: Wiley.
- Montgomery, D. C., & Johnson, L. A. (1976). *Forecasting and time series analysis*. New York: McGraw Hill.
- Oakland, J. S. (1996). *Statistical process control*. Oxford, England: Butterworth-Heinemann.

- Ortiz, C., & Ortiz, O. A. (2006). *Assembly, designing, constructing and managing a lean assembly line*. Boca Raton, FL: CRC Press.
- Plosel, G., & Wight, O. (1967). *Production and inventory control*. Englewood Cliffs, NJ: Prentice Hall.
- Prenting, T. O., & Thomopoulos, N. T. (1974). *Humanism and technology in assembly line systems*. Englewood Cliffs, NJ: Spartan–Hayden.
- Rushton, A., Croucher, P., & Baker, P. (2006). *The handbook of logistics and distribution management*. London, England: Kogan Page.
- Shewhart, W. A. (1939). *Statistical method from the viewpoint of quality control*. Washington, DC: U. S. Department of Agriculture.
- Thomopoulos, N. T. (1980). *Applied forecasting methods*. Englewood Cliffs, NJ: Prentice Hall.
- Thomopoulos, N. T. (1990). *Strategic inventory management and planning*. Carol Stream, IL: Hitchcock.
- Thomopoulos, N. T. (2012). *Fundamentals of production, inventory and the supply chain*. New Delhi, India: Atlantic.
- Thomopoulos, N. T. (2014). *Assembly line planning and control*. New York: Springer.
- Thomopoulos, N. T. (2015). *Demand forecasting for inventory control*. New York: Springer.
- Vollman, T. E., Berry, W. L., & Clay Whybark, D. (1997). *Manufacturing planning and control*. New York: McGraw Hill.
- Weiss, H. J., & Gershon, M. E. (1989). *Production and operations management*. Boston: Allyn & Bacon.
- Wild, R. (1975). *Work organization, a study of manual work and mass production*. New York: Wiley.

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