This course covers fundamentals of operational analysis for various performance issues encountered in real life supply chain processes. The major topics include demand forecasting, sales and operations planning (S&OP), inventory models and deployment strategies, uncertainty and safety stock management, supply chain collaborative planning, business capacity planning, quality management, project cost management and risk analysis. Case studies on developing cost-effective solutions for continuous improvement of a company’s operational efficiency and strategic position in today’s highly dynamic and competitive marketplace are used. The objective of this course is to help our students to develop analytical thinking skills and to build the knowledge of business performance optimization toward operational excellence of supply chains.

Major topics (Suggested reading material):

1. Introduction (Chapters 1, 6)

   . Cost, profitability, and business processes
   . Designing a business process toward operational excellence
   . Successful operations strategies and models used in practices
   . The bullwhip effect and supply chain coordination
   . The supply chain operations reference (SCOR) model
   . Overview of sourcing issues
   . Overview of supply chain logistics issues

2. Demand Forecasting (Chapter 2)

   . Fundamentals of forecasting techniques and laws of forecasting
   . Demand analysis and time series
   . Methods for predicting stationary series
   . Trend-based forecasting methods
   . Analyzing and predicting seasonal series
   . Using Excel for demand forecasting
3. **Sales and Operations Planning (S&OP) Techniques** (Chapter 3)

- Overview of sales and operations planning techniques
- Aggregate planning analysis
- Linear programming and integer programming modeling techniques
- Using Excel Solver to solve linear programming problems
- Demand management techniques

4. **Inventory models with known demand** (Chapter 4)

- The impact of inventory management on company’s profit margin
- Fundamentals of inventory models
- The planned shortage model, and the mixed SKU model
- Quantity discount analysis and the impact of discount policies on business performance
- Optimal inventory policies for multi-player supply chains

5. **Inventory models with unknown demand** (Chapter 5)

- The classical newsboy models and applications for optimizing service capacity
- The lot size - reorder point (Q, R) systems
- The service level approaches (The $\alpha$-service Level and the $\beta$-service level)
- Deriving the optimal Q-R Policy subject to a given $\beta$-service level
- Analysis of the cost of uncertainty
- Managing safety inventory in a supply network and the Square Root Law

6. **Project Management** (Chapter 10)

- Introduction to project planning and control
- Project Management leaderships
- The critical path method (CPM) and program evaluation and review technique (PERT)
- Project risk analysis
- Project cost/budgeting and resource allocation models

7. **Introduction to Statistical Quality Control** (Chapter 12)
Supply Logistics Challenge Exam Registration Form
($50 non-refundable fee payable to Rutgers University by January 9, 2018)
Mail the form below with a check to:

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Email: dtorres@business.rutgers.edu
Office: 973-353-5266

**New Brunswick:**
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Rutgers Business School, BRR Room 3145
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