

## Course Outline

**Course Code** : DBA4812  
**Course Title** : Supply Chain Analytics  
**Class Date** : From 15/8/2024 To 14/11/2024  
**Semester** : Semester 1, Academic Year 2024/2025  
**Faculty** : Adjunct Associate Professor Yuan Xue-Ming, PhD  
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### Overview

In today's competitive business environment, effective supply chain management is essential for companies seeking to gain a competitive edge. Supply Chain Analytics stands at the forefront of this pursuit, enabling crucial decision-making through the application of scientific methodologies and advanced analytics. This course is designed to equip business school students with the necessary skills to navigate and excel in the complex world of supply chains.

Business Analytics forms the foundation of Business Intelligence, providing the essential tools and techniques for evaluating and optimizing supply chain performance. In this course, students will learn to apply these techniques to develop models that enhance decision-making and drive practical, managerial insights. The curriculum is designed to impart versatile analytical skills, allowing students to model, analyze, and solve supply chain challenges across various industries.

With the advent of Industry 4.0, an unprecedented amount of data is now available to support decision-making and create business value across supply chains. This course leverages these advancements, teaching students to harness data to understand past and current supply chain dynamics, predict future trends, and make optimal decisions. These analytical skills are critical for helping companies maintain and enhance their competitive positions in the market.

The course offers comprehensive coverage of the entire supply chain spectrum, from customers to distributors, warehouses, plants, and suppliers. Through real-world scenarios and practical applications, students will gain hands-on experience with an intelligent forecasting system. This exposure will enable them to effectively plan for customer demands, manage inventory, optimize production capacities, and determine material requirements.

One of the key strengths of this course is its emphasis on drawing practical insights from analytical solutions. Students will not only learn theoretical concepts but also how to apply these concepts in real-world settings. This practical approach ensures that graduates are well-prepared to tackle the complexities of supply chain management in various industries. Furthermore, the course is designed to be highly relevant to current industry needs. As businesses increasingly rely on data-driven decision-making, the skills acquired in this course will be in high demand. Students will be equipped with cutting-edge tools and techniques, positioning them as valuable assets to any organization.

### Course Objectives

The course objectives are to equip students with versatile analytical skills in modelling, analyzing and solving Supply Chain Management problems from various industries and to provide practical hands-on experience in planning for customer demands, inventory consumption, production capacities, material requirements, etc.

### Assessment

Assessment Components	Weightage
Class Participation	20%
Assignments	20%
Project	30%
Test	30%

### Schedule and Outline

Lesson/ Week	Date	Session (lesson summary or outline / learning objectives / preparation / cases & assignments / follow-up readings & resources)
1	15 Aug 2024	Supply Chain Analytics: Overview
2	22 Aug 2024	Data Driven Analytics Basics: Events and Probability, Random Variables, Functions of Random Variables, Inequalities, Limit Theorems
3	29 Aug 2024	Statistical Sampling: Distribution Estimates, Sample Mean and Variance, Confidence Intervals, Proportion Estimates, Experimental Design
4	05 Sep 2024	Supply Chain Simulation Modelling: Discrete Event Simulation, Simulation Modelling, Simulation Applications
5	12 Sep 2024	Supply Chain Simulation Modelling: Discrete Event Simulation, Simulation Modelling, Simulation Applications
6	19 Sep 2024	Demand Forecasting Techniques with Applications: Importance of Demand Forecasting, Forecasting Methods, Forecasting Accuracy Evaluation
7	03 Oct 2024	Optimal Forecast and Intelligent Forecasting System: Forecasting Case Study, Optimal Forecasting Method, Intelligent Forecasting System, Industry Success Cases
8	10 Oct 2024	Supply Chain Demand Planning and Management: Aggregate Planning, Aggregate Planning Strategies, Managing Demand
9	17 Oct 2024	Supply Chain Inventory Models: Stochastic Inventory Models with and without Fixed Ordering Cost, Multi-period Inventory Models
10	24 Oct 2024	Supply Network Optimization: Network Concepts, Network Shortest Path, Optimal Supply Network
11	31 Oct 2024	Integrated Supply Chain Decision Modelling: Integrated Models in Airline Industry, Integrated Models in Emergency Medical Service
12	07 Nov 2024	Project Presentation
13	14 Nov 2024	Classroom Test

### **General Guide & Reading**

(e.g. Case preparation guide, project report guide, main textbook & supplementary materials, etc)

- [1] Chopra, S. and P. Meindl, Supply Chain Management: Strategy, Planning, and Operation, 6th Edition, Pearson Education, 2016
- [2] Simchi-Levi, D., P. Kaminsky and E. Simchi-Levi, Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies, McGraw-Hill/Irwin, 2007
- [3] Bertsimas, D. and R. M. Freund, Data, Models, and Decisions: The Fundamentals of Management Science, 2nd Edition, Dynamic Ideas Publisher, 2004
- [4] Hillier, F. S. and M. S. Hillier, Introduction to Management Science: A Modelling and Case Studies Approach with Spreadsheets, 5th Edition, McGraw Hill Publisher, 2013

### **Academic Honesty & Plagiarism**

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule - You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. In case of any doubts, you should consult your instructor.

### **Additional guidance is available at:**

- [Administrative Policies](#)
- <http://www.nus.edu.sg/registrar/administrative-policies-procedures/acceptance-record#NUSCodeofStudentConduct>
- <http://nus.edu.sg/osa/resources/code-of-student-conduct>