Course Outline

Course Code   : DBA4812
Course Title   : Supply Chain Analytics
Class Date   : From 18/1/2024   To 18/4/2024
Semester   : Semester 2, Academic Year 2023/2024
Faculty   : Adjunct Associate Professor Yuan Xue-Ming, PhD
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Overview

Supply Chain Analytics refers to data-driven supply chain management wherein crucial decisions for companies to gain competitive edges in their respective businesses are supported by scientific decision making methodologies using analytics.

This course applies Business Analytics techniques to formulate supply chain models for evaluating and optimizing supply chain performances. Emphasis will be placed on drawing practical perspectives and managerial insights from analytical solutions. It will equip students with versatile analytical skills in modelling, analysing and solving supply chain management problems from various industries, and provide practical hands-on experience in planning for customer demands, inventory consumption, production capacities, material requirements, etc.

With the advancement of Industry 4.0 technologies, more and more data are becoming available for making the right decisions and creating business values across supply chains. Students will learn how to use the available data to understand what has happened in the past and what is currently happening, as well as to predict what will happen in the future and to make optimal decisions. These analytical skills are crucial for helping companies to gain competitive edges in their respective businesses.

The course covers the whole spectrum of supply chains from customers to distributors, warehouses, plants and suppliers. Students will be equipped with versatile analytical skills in modelling, analyzing and solving Supply Chain Management problems. Students will also have the opportunity to work with an intelligent forecasting system to gain practical hands-on experience in forecasting and planning for customer demands, inventory consumption, production capacities, material requirements, etc.

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	18 Jan 2024	Supply Chain Analytics: Overview
2	25 Jan 2024	Data Driven Analytics Basics: Events and Probability, Random Variables, Functions of Random Variables, Inequalities, Limit Theorems
3	1 Feb 2024	Statistical Sampling: Distribution Estimates, Sample Mean and Variance, Confidence Intervals, Proportion Estimates, Experimental Design
4	8 Feb 2024	Supply Chain Simulation Modelling: Discrete Event Simulation, Simulation Modelling, Simulation Applications
5	15 Feb 2024	Supply Chain Simulation Modelling: Discrete Event Simulation, Simulation Modelling, Simulation Applications
6	22 Feb 2024	Demand Forecasting Techniques with Applications: Importance of Demand Forecasting, Forecasting Methods, Forecasting Accuracy Evaluation
7	7 Mar 2024	Optimal Forecast and Intelligent Forecasting System: Forecasting Case Study, Optimal Forecasting Method, Intelligent Forecasting System, Industry Success Cases
8	14 Mar 2024	Supply Chain Demand Planning and Management: Aggregate Planning, Aggregate Planning Strategies, Managing Demand
9	21 Mar 2024	Supply Chain Inventory Models: Stochastic Inventory Models with and without Fixed Ordering Cost, Multi-period Inventory Models
10	28 Mar 2024	Supply Network Optimization: Network Concepts, Network Shortest Path, Optimal Supply Network
11	4 Apr 2024	Integrated Supply Chain Decision Modelling: Integrated Models in Airline Industry, Integrated Models in Emergency Medical Service
12	11 Apr 2024	Project Presentation
13	18 Apr 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