Course Outline

Course Code : DAO1704
Course Title : Decision Analytics using Spreadsheets
Class Date : From 8/12/2024 To 15/11/2024
Semester : Semester 1, Academic Year AY2024/25
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Overview

In today's landscape of big data, companies can collect vast amounts of data, sometimes more than necessary. The adage "Information is Power" holds true only if companies can swiftly and accurately decipher the data they have collected. In this landscape, the strategic application of Business Analytics for modeling and decision-making emerges as the cornerstone of tomorrow's successful enterprises.

This course equips students with both the theoretical understanding and practical skills necessary to extract valuable business insights from data, thereby empowering effective decision-making using Spreadsheets. Practical examples and cases with rich data are used to stimulate students' interest and foster their understanding of the use of Business Analytics in management and business domains.

Course Objectives

The objective of this course is to foster students' proficiency in leveraging Spreadsheets within business contexts. By integrating the data dimension into decision-making processes across organizational levels, students will gain the necessary skills to make informed decisions in diverse organizational/business settings.

Assessment

Assessment Components	Weightage
1. Final Project and Presentation (Group & individual)	15%
2. Class Participation (Individual)	10%
3. Quizzes (Individual)	10%
4. Assignments (Individual)	15%
5. Final Exam (Individual)	50%

Schedule and Outline

Lesson/ Week	Session

	(lesson summary or outline / learning objectives / preparation / cases & assignments / follow-up readings & resources)
1	Introduction to the course • Course administrative matters • Introduction to Business Analytics • Review of basic probability concepts.
2	Data Intelligence • Introduction to basic summary analytics using Excel • Introduction to basic data visualization using Excel • Pivot Table analysis
3	Basic Probability Concepts • the calculation of conditional probability • Bayes' theorem • the independence concept
4	Discrete Probability Distributions • Differentiate between Binomial and Poisson distributions • Solve questions involving discrete probability distributions • Apply Excel's probability functions to compute the required probabilities
5	Continuous Probability Distributions • Differentiate between discrete and continuous probability distributions • Solve questions involving continuous probability distributions • Apply Excel's probability functions to compute the required probabilities
6	Introduction to Simulation Modelling • Use Excel to simulate a variety of random variables • Carry out Simulation to analyse business decision problems
7	Decision making via Decision Trees • Illustrate a decision tree and its power in decision making • Use decision tree to make business decisions under uncertainty
8	Introduction to Linear Optimization • Formulate a Linear Programming (LP) mathematical model • Solve the optimal solution of an LP using Excel solver • Geometry of linear optimization
9	Sensitivity Analysis and Shadow Prices in Linear Optimization • Explain what are shadow prices • Understand allowable increase and decrease • Interpret a sensitivity report
10	Introduction to Discrete Optimization • Construct binary constraints • Logical constraint formulation • big-M notation
11	Application of Optimization
12	E-Presentation I: final group project
13	E-Presentation II: final group project

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

Textbook:

AE Business Analytics: Data Analysis & Decision Making, 7th Edition

S. Christian Albright, Wayne L. Winston

ISBN-13: 9789814878180 | ISBN-10: 9814878189

Lecture notes, case studies and teaching videos

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