**NATIONAL UNIVERSITY OF SINGAPORE**

**NUS Business School**

**Department of Analytics & Operations**

**DAO1704X Decision Analytics Using Spreadsheet**

**Lecturer:** Dr. TUNG, Yi-Liang

**Session**: Semester 1, 2020/2021

**Description**

We are now at the era of big data. Companies are able to collect tremendous amounts of data, very often more than necessary, with ease. “Information is Power” is no longer valid if companies are not able to make correct decisions timely out of the data. The use of business analytics for modeling and decisions represents the future of best practices for tomorrow’s success companies.

This course prepares students with fundamental theory and basic instruments to capture business insights from data and thus make good managerial decisions using spreadsheets. Quantitative models and tools such as Decision Analysis, Simulation Modeling and Mathematical Optimization are covered to demonstrate the use of scientific methods in business decision making. Practical examples and cases with rich data are used to stimulate students’ interest and understanding in Business Analytics.

**Objectives**

Students are expected to become proficient in the extensive use of spreadsheets in the business environment. The module will enable students to consider the data dimension in making decisions at all levels in the corporate setting.

**Course Outline**

1. **Understanding Data**
   1. Data Management and Visualization with Pivot Table
   2. Laws of Probability, Bayes Theorem, Covariance
   3. Basic Probability Distributions
2. **Managerial Decision Analysis**
   1. Decision Tree Models and Analysis using Spreadsheet
   2. Sensitivity Analysis
3. **Simulation Modeling: Concepts and Practice**
   1. Random Number Generators
   2. Using the Sample Data for Analysis
   3. Using Histogram and Other Excel Charts to Summarize and Visualize Simulation Results for Decision Making
4. **Optimization Models and Their Applications**
   1. Formulating Management Problems
      1. Linear Optimization Model
      2. Nonlinear Optimization Model
      3. Discrete Optimization Model
   2. Using Excel Solver to obtain the optimal solution of a linear programming problem and sensitivity analysis

**Reading List**

Compulsory reading:

“Business Analytics: Data Analysis and Decision Making” 6th Edition by Albright and Winston

Supplementary reading:

“The Analytics Edge” by Allison K. O'Hair, Dimitris Bertsimas, and William R. Pulleyblank

Course Package

**Prerequisites**

Fundamental skills in Excel.

**Weightage of Assessment**

Continuous Assessment:

Class Participation 15%

Group Project 15%

Quiz 15%

Assignments 15%

Final Examination 40%