

## Course Outline

**Course Code** : DBA3803  
**Course Title** : Predictive Analytics in Business  
**Class Date** : From 15/1/2024 To 19/4/2024  
**Semester** : Semester 2, Academic Year 2023/2024  
**Faculty** : Tan Hong Ming  
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### Overview

This introductory course focuses on key aspects of modern data science in the business world, particularly emphasizing methods in regression and classification. We will cover linear and polynomial regression, logistic regression, and essential techniques such as cross-validation, model selection, and regularization (including ridge and lasso). We'll also venture into nonlinear models, tree-based methods like random forests and boosting, support-vector machines, and neural networks. Finally, we will also touch on unsupervised learning with topics on principal components and clustering (k-means and hierarchical).

### Course Objectives

Gain an understanding of key supervised learning methods including regression and classification techniques.

Learn to apply various data science tools and techniques such as linear and polynomial regression, logistic regression, cross-validation, and model selection.

Learn to apply theoretical concepts in practical, real-world business scenarios, enhancing analytical and decision-making skills.

### Assessment

Assessment Components	Weightage
Class Participation	10%
Group Project	30%
Quiz	30%
Assignments	30%

### Schedule and Outline

Lesson/ Week	Date	Session (lesson summary or outline / learning objectives / preparation / cases & assignments / follow-up readings & resources)
1	15 Jan	Introduction
2	22 Jan	Statistical Learning
3	29 Jan	Linear Regression
4	5 Feb	Classification

5	12 Feb	Chinese New Year Week (no lesson)
6	19 Feb	Resampling Methods
R	24 Feb	Reading week
7	4 Mar	Model Selection
8	11 Mar	Tree based Methods
9	18 Mar	Support Vector Machines
10	25 Mar	Deep learning
11	1 Apr	Model Interpretability
12	8 Apr	Unsupervised Learning
13	15 Apr	Issues for Society

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

Lecture Slides

Taddy, Matt. *Business data science* (2019).

Hull, John C. *Machine Learning in Business: An Introduction to the World of Data Science* (2020).

James, Gareth, et al. *An introduction to statistical learning* (2013).

### **Academic Honesty & Plagiarism**

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