

授課教師：林希偉

Instructor: Shi-Woei Lin

課程名稱：計量管理

Course Title : Quantitative Analysis for
Business Decisions

2026/5/6

課程代號：IM5108701 Course Code 學分數：3 Credits	必選修：選修/半學年 Required/Elective: Elective/Half Yr. 先修課程： Prerequisites
節次教室：F6(MA-101) F7(MA-101) F8(MA-101) Time/Location	
專業核心能力： Core Professional Competencies	
課程網址：moodle.ntust.edu.tw Course Website	
課程宗旨：This course prepares students to gather, describe, and analyze business data, and use quantitative methods (including advanced statistical tools and data mining tools) to make better decisions on operations, risk management, finance, marketing, etc. In other words, this course will focus mainly on theory and best practices of modern business analytics, with particular attention to predictive modeling. In addition to working with RStudio and R packages, students will also become experienced in methods of reproducible research, and professional communication of analytic results. 本課程旨在培養學生收集、描述及分析商業數據的能力，並運用量化方法（包括進階統計工具與資料探勘工具）來做出最佳的決策，涵蓋營運管理、風險管理、財務、行銷等領域。換言之，本課程關注於現代商業分析的理論與最佳實踐，且特別著重於預測建模（Predictive Modeling）。除了學習 RStudio 及 R 套件之外，學生也將學習如何專業地傳達分析結果。	
課程大綱： Outline of Lectures	

- PART-I Introduction to R Programming and Business Data
- Introduction to R & RStudio
 - Overview of the data analytics process
 - Data manipulation & exploration (including data visualization)
 - Dimension reduction
 - Evaluation of the model and predictive performance
- PART-II Business Analytics Methods and Practices
- Multiple linear regression & Logistic regression
 - K-nearest Neighbors
 - The Naïve Bayes Classifier
 - Classification and regression trees
 - Neural Nets
 - Clustering analysis and market segmentation
 - Regression-based and smoothing-method time series forecast
 - Social network analytics
 - Text mining

週次 主題

- 1 課程介紹
- 2 數據分析流程概述與資料視覺化
- 3 臺科大校慶調整放假 (停課)
- 4 資料視覺化
- 5 迴歸分析
- 6 正則化線性模型 (LASSO & Ridge 迴歸模型)
- 7 預測性能評估與邏輯斯迴歸
- 8 決策樹 (含分類樹與迴歸樹)
- 9 類神經網路
- 10 關聯規則 (購物籃分析相關方法)
- 11 協同過濾 (推薦系統相關方法)
- 12 (預計考試日)
- 13 第一次業界專家訪談
- 14 群集分析與市場區隔
- 15 第二次業界專家訪談與其他資料探勘主題 (如社群網絡分析或文字探勘)
- 16 期末專題簡報
- 17 (非同步課程) 集成學習與 Uplift 建模、協同過濾相關主題
- 18 (非同步課程) 協同過濾或基於選擇的聯合分析

授課方式： 講授 Lecture：75%
Method of Instruction 分組討論 Group discussion：0%
案例研討 Case study：25%
操做練習 Practical exercises：0%
講授 Lecture：%

教科書： No required textbook for this course.
Textbooks

參考書目： Reference Textbooks:
References (1) Shmueli, Galit et al. (2018) Data Mining for Business Analytics: Concepts, Techniques, and Applications in R. NJ: Wiley.
(2) Johannes Ledolter (2013) Data Mining and Business Analytics with R, NJ: Wiley.
(3) Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani (2013) An Introduction to Statistical Learning with Application in R. Springer.

修課須知：
Notice

評量方式： class participation and contributions 10%
Grading business analytics assignments 30%
exams 20%
team project 40%

備註說明： Per-requisite: Undergraduate statistics or equivalent
Notes