

# ISOM5610

## Introduction to Business Analytics

### LECTURE

Instructor: Dr. Baoqian PAN, Kris

Room: 5041 (LSK Business building); Email: [ismtpbq@ust.hk](mailto:ismtpbq@ust.hk)

Office Hours: 1 hour after class or send an email to make an appointment.

Teaching Assistant: Elvis LEE

Room: 4065(LSK); Email: [imelvis@ust.hk](mailto:imelvis@ust.hk)

Office Hours: 1 hour after class or send an email to make an appointment

Class schedule: 31-OCT-2020 - 19-DEC-2020 (Saturday)

Time: 2pm-5:20pm

Venue: ZOOM

### COURSE DESCRIPTION

This course provides an introduction to the field of business analytics, which has been defined as the extensive use of data, statistical and quantitative analysis, exploratory and predictive models, and fact-based management to drive decisions and actions. The fundamental principles and techniques of exploratory modeling and analysis will be discussed: selected exploratory models such as linear and nonlinear regression models will be introduced and their applications in the different business functional areas will be illustrated through real-world examples and case studies.

### COURSE OBJECTIVES

- To gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
- To become familiar with the processes needed to develop, report, and analyze business data.
- To learn how to use and apply selected business analytics software.

### PREREQUISITES

ISOM5510 Data Analysis

# TENTATIVE COURSE OUTLINE

## Topic 1: Multiple Regression

- Multiple linear regression model
- Multicollinearity
- Residual Analysis
- Using dummy variable, slope dummy variable and interaction variable
- Case: Nopane Advertising Strategy

## Topic 2: Fitting Curve to Data

- Quadric regression
- Logarithmic regression
- Case: The Baseball Case

## Topic 3: Model Building

- Subset Selection method (All/Best subset, Forward, Backward, Stepwise)
- Regulation or shrinkage method (Lasso)
- Dimension reduction method (Principle component regression)
- Case: Variable Selection of Financial Indicators to Predict Stock Price

## Topic 4: Times Series Analysis and Forecasting

- Trend analysis
- Seasonal analysis
- Smoothing techniques
- Forecasting models
- Forecast Error Comparisons
- Case: Harmon Food

## Topic 5: Logistic Regression

- Building a linear model for binary response data
- Interpretation of the regression coefficient
- Statistical inference
- Assumption and diagnosis checking
- ROC curve
- Classification of new cases
- Case: Default of Credit Card Clients

## Topic 6: Poisson Regression and Generalized Linear Model

- For Count data
- For Rate data
- Negative Binomial Regression
- Generalized Linear Model
- Case: Auto Insurance Claim

## Topic 7: Survival Analysis

- Failure time and censoring

- The survival and hazard function
- Parametric survival regression
- Cox proportional hazard regression –semiparametric model
- Case: Employee Attrition

\* This syllabus is subject to change without notice at the instructor's discretion.

## **REFERENCE BOOK**

*Doing Data Science: Straight Talk from the Frontline.* by Rachel Schutt & Cathy O'Neil.

## **SOFTWARE**

R, Python, Minitab, SPSS and SAS

## **GRADING**

Your grade in the course is based on: HW 40%, Final Project 60%.

## **Homework**

It is a group homework of 5 members. You will be given some business cases to practice.

## **Final Project**

It is a group project of 5 members. It mainly consists of 3 parts: presentation, report and peer evaluation; The presentation will be conducted during the last lecture and each group will be given at most 15 minutes. You have to select a topic from our list or propose your own business problem, the details will be given later.

## **GRIEVANCE PROCEDURE**

If you disagree with grades that have been assigned to your work, you have the possibility to meet instructors within one week after the grades have been published on the course website. Be specific about what it is that you don't agree with.

## **ACADEMIC INTEGRITY**

Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of other groups, or tampering with the academic work of other groups. All exam answers must be your own, and you must not provide any assistance to other students during exams. Current university policy on academic dishonesty is “if a student is discovered cheating however minor the offence, the course grade will appear on the students' record with an X, to show that the grade resulted from cheating.” This X grades stays on the record until graduation. If the student cheats again and “earns” another X grade, the student will be dismissed from the university.