ISOM2600 (L1)
Introduction to Business Analytics

DESCRIPTION
This course introduces students with the foundation needed to apply data analytics to real-world challenges they will confront in their future career. It covers statistical methods in descriptive analytics and predictive analytics, including regression, variable selection, classification and clustering. This course provides students with the fundamental concepts and tools needed to understand the emerging role of business analytics in organizations and shows students how to apply basic business analytics methodology using the current popular software, and how to communicate with analytics professionals to effectively use and interpret analytic models and results for making better business decision. Emphasis is placed on statistical reasoning and interpretation of results, rather than proof of theory and coding. Students only use Python language as a tool to analysis data.

LEARNING OBJECTIVE
1. To gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
2. To select and apply appropriate statistical models in the analysis of quantitative and qualitative data from a variety of business scenarios.
3. To learn how to use Python to apply the statistical models on the business problems.

PREREQUISITES
ISOM2500 Business Statistics
ISOM2020 Coding for Business

LECTURE
Instructor: Dr. Baoqian PAN, Kris
Room: 5041 (LSK Business building); Email: **ismtpbq@ust.hk**
Office Hours: half an hour after class or make an appointment.

Teaching Assistant: Mr. Elvis LEE
Room: LSK 4065; Email: **imelvis@ust.hk**
Office Hours: send an email to make an appointment.

Lab section:
Lab sections is arranged to learn Python code and review important course content.

COURSE WEBSITE
http://canvas.ust.hk

SYLLABUS
This syllabus is subject to change in the event of extenuating circumstances.

Topic 0: Introduction to Business Analytics and Review of Simple Linear Regression

Topic 1: Multiple Linear Regression
- Multiple linear regression model
- Multicolinearity
- Residual Analysis
- Case 1: Retail Profit

Topic 2: Fitting non-Linear Pattern
- Log transformation
- Using dummy variable and interaction variable
- Case 2: Real estate valuation data set

Topic 3: Variable Selection
- Best subset selection
- Criteria: C_p, AIC, BIC, adjusted R^2
- Validation set approach and cross validation approach
- Forward selection
- Case 3: Wine quality

Topic 4: Classification
- Distance measure
- Logistic regression model
- Case 4: Census Income

Topic 5: Clustering
- Hierarchical clustering
- K-means
- Case 5: Financial data

REFERENCE BOOK
*Python Data Science Handbook, Jake Vanderplas

PROGRAMMING LANGUAGE
Python

GRADING

Your grade in the course is based on: HW 40%, Final exam 50%, Peer evaluation 10%.

Assignment 1 (3 students/group, deadline: week 3)	10%
Assignment 2 (3 students/group, deadline: week 5)	15%
Assignment 3 (3 students/group, deadline: week 7)	15%
Final exam (individual)	50%
Peer evaluation	10%

Notes:

A. Homework assignment 40%. There will be 3 Group HWs.

   Note:
   1) There should be 3 persons in each group.

      Please submit the soft copy of the assignment to us through CANVAS:

      For the soft copy, please sign the name on the cover page of assignment (before the deadline); otherwise, you will have no record for HWs. The excuses, i.e. "forget to sign", "Other members submit the HW without notice" etc. are not accepted.

      Note: CANVAS will automatically close the submit channel right after the deadline. It is the supporting evidence to your punctual submission of homework. No argument is allowed for those students who claim that they have submitted the homework but CANVAS did not receive it, or there is no *submit* button. Because the *submit* button is gone automatically right after the deadline. You are strongly recommended to test the *submit* button and submit your homework earlier.

   2) Free riding is not allowed.

      If you don't join the discussion of HWs, other members from your group have the right to submit HW without your permission and without your name on it. In addition, if you have little contribution in the discussion (e.g. Show up without preparation), your group-mates can send an email to notice me.

      Note: you can use ZOOM meeting, WeChat or WhatsApp for discussion. Please keep a record just in case you need to file a complaint.

B. Final Exam 50%

   If the final exam is missed, you won't pass the course. No make-up final exam will be provided.

C. Peer Evaluation 10%.
   You need to conduct peer evaluation after assignment 2. If you do not conduct the peer evaluation before the deadline, you will not get the score for this part.

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.

Submit your soft copy of assignment to us on Canvas which will be the supporting evidence of your submission of assignment. Late submission will not be accepted.