

ISOM2600 (L1-L2)

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.

COURSE INTENDED LEARNING OUTCOMES

Upon completion of this course, students are expected to be able to

1. Gain an understanding of how managers use business analytics to formulate and solve business problems and to support managerial decision making.
2. Select and apply appropriate statistical models in the analysis of quantitative and qualitative data from a variety of business scenarios.
3. Practice implementing statistical models in Python for business applications.

PREREQUISITES

ISOM2500 Business Statistics

ISOM2020 Coding for Business

LECTURE

Instructor: Prof. 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 (imelvis@ust.hk)

Room: LSK 4065

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 1: List, Array and Graphing

- List
- array
- Graphs

Topic 2: Pandas and Data Processing

- Missing data
- Data slicing
- Feature engineering
- Exploratory data analysis

Topic 3: Multiple Linear Regression

- Review of simple linear regression model
- Parameter Estimate and Interpretation
- Residual Analysis and outliers
- Multicollinearity
- Hypothesis testing and confidence interval
- Evaluate prediction accuracy using test set

Topic 4: Clustering

- K-means

REFERENCE BOOK

* Python Data Science Handbook, 2^{ed}, Jake Vanderplas

PROGRAMMING LANGUAGE

Python

GRADING

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Your grade in the course is based on: Lab assignment 30%, Final exam 60%, Class participation 10% and Peer evaluation.

Lab Assignment 1 (3 students/group, deadline: week 5)	10%
Lab Assignment 2 (3 students/group, deadline: week 7)	10%
Final exam (individual, Multiple choice, 1 hour)	70%
Class participation (In-class survey)	10%
Peer evaluation	Downgrade when necessary

Notes:

A. Lab assignment 20%. There will be 2 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.

An AI use policy is in effect: even if an answer is correct, if the TA determines it was copied directly from an AI tool, they retain the right to downgrade the work.

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 70%

Individual, 40MC, 70 minutes exam. Python will be tested. Close book.

You can bring 2-page A4 size handwritten cheat sheets to the exam.

Important note: If you are absent from the final exam due to illness, you must report the circumstances of the case **in writing**¹ and **provide appropriate evidence or documentation**² to the instructor and TA **within one week** of the scheduled date of the final exam. The make-up of the final exam will be provided in the **Summer term**.

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

¹ Please download form: [Report on Extenuating Circumstances Affecting Assessment \(ITSC log-in\)](#)). Complete this form and submit to the TA and instructor.

² **Appropriate documentation** proving the student's illness **on the day of the missed assessment MUST be provided.**

C. Class participation 10%. Each class 2%.

How to get full mark of class participation?

Finish the in-class survey in 5 out of 6 lectures. (i.e. you may miss one class).

D. Peer Evaluation.

You need to conduct peer evaluation after lab assignment 2. If you do not conduct the peer evaluation before the deadline, you will not get the score for this part. If you do not contribute for the lab assignment, you will be downgraded.

FINAL GRADE DESCRIPTORS:

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Students with excellent performance demonstrate a comprehensive grasp of lecture materials, effectively applying statistical concepts and Python programming to real business problems. They excel in lab assignments by writing clean, efficient, and well-documented code and can translate analytical results into clear, actionable managerial recommendations. They demonstrate exceptional teamwork, often taking leadership roles in delegating tasks and synthesizing findings into a cohesive narrative.
B	Good Performance	Students with good performance exhibit a solid understanding of how business analytics supports managerial decision making. They correctly select and apply standard statistical models to quantitative and qualitative data across various business scenarios, though they may occasionally default. They practice implementing these models competently in Python, producing functional code with minor inefficiencies. Assignment progress is well-planned and executed with effective teamwork, though insights may lack depth.
C	Satisfactory Performance	Students with satisfactory performance demonstrate adequate comprehension of core concepts and can write basic Python code to complete structured lab tasks with minor errors. They complete the required assignment, though analysis may be superficial or reliant heavily on example code. They display satisfactory skills in using analytics tools and participate in teamwork, but may struggle with independent problem-solving or interpreting the business implications of their findings.

D	Marginal Pass	Students with a marginal pass show a limited understanding of lecture materials, often confusing statistical concepts or failing to correctly apply Python syntax. Lab assignments are frequently incomplete, late, or contain significant logical errors. Progress on the group assignment is minimal, with heavy reliance on teammates to perform technical tasks. They exhibit limited proficiency statistical analysis and coding and struggle to connect data outputs to actionable business recommendations.
F	Fail	Students who fail the course display a pervasive lack of understanding of business analytics fundamentals taught in the lecture. They are unable to successfully complete Python lab assignment or submit code that fails to run. They show little to no contribution to teamwork, lacking the ability to load data, perform basic Statistical analysis, or generate visualizations. Essential skills in analytical reasoning, programming, and teamwork are not demonstrated, indicating an insufficient foundation to progress in the field.

COURSE AI POLICY

In the assignments, you are permitted to use generative artificial intelligence (AI) as a tool in any way you see fit. However, you must give proper credit for any AI assistance and ensure that you personally revise and adapt the content. Even if your answer is correct, the TA reserves the right to downgrade your work if it is determined to be a direct copy-and-paste from AI.

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

The University has zero tolerance of academic misconduct. Please refer to [Academic Integrity | HKUST – Academic Registry](#) for the University's definition of plagiarism and ways to avoid cheating and plagiarism.

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.