

ISOM2500 (L5, L6) - Business Statistics

Syllabus

OBJECTIVES AND INTENDED LEARNING OUTCOMES

The objective of the course is to introduce the basic knowledge of statistics, including topics like descriptive statistics, probability, statistical inference, and linear regression. Through the learning process, students will develop critical and independent thinking. Together with the analytical tools, students may be able to handle uncertainty and analyze data efficiently in the real business world.

To achieve the goals, beyond the provision of a solid understanding of concepts and toolboxes, we study a substantial amount of practical examples in the business world, to help students gain first-hand experiences with data.

LECTURE

Instructor: Professor Lucy Xia

Email: lucyxia@ust.hk

Office Hours on Zoom: Tue. 6:00pm-7:00pm; or send an email to make appointments

Instructional Assistant: Ms. Stacy Deng

Email: imsdeng@ust.hk

Office Hours on Zoom: Fri. 11:00am-12:00pm; or send an email to make appointments

Lab section: four tutorial sections will be arranged to help learn Minitab software, Excel add-in and practice the exercise. Please pay attention to the Canvas email.

Class meets:

L5: 15:00pm – 16:20pm Tue. Thur.

L6: 16:30pm – 17:50pm Tue. Thur.

REFERENCE BOOK

Stine and Foster, “Statistics for Business: Decision Making and Analysis”, 2nd Pearson.

COURSE WEBSITE

<http://canvas.ust.hk>

COURSE MATERIALS

Topic 1 Data description

- - Recognizing the type of data
- - Using graphs to see the characteristics of data
- - Summarizing messy data into neat numbers

Topic 2 Probability

- - Probability
- - Random variable, distributions

Topic 3 Random variables

- - Discrete random variables: Bernoulli, Binomial distribution
- - Continuous random variables: Uniform, normal distribution, t-distribution

Topic 4 Estimation

- - Point estimate, Sampling distribution
- - Confidence intervals

Topic 5 Hypothesis testing

- - One sample, statistically significant?
- - Errors of statistical testing: Type I and Type II errors
- - Two independent samples significantly different?
- - Examining relationships for nominal and ordinal data

Topic 6 Simple Linear regression

- - Basic concept
- - Checking model assumption
- - Prediction and estimation

EVALUATION

Your grade in the course is based on:

| | |
|----------------------------|------------|
| Quiz 1 (March 9 in class) | 20% |
| Quiz 2 (April 8 in class) | 20% |
| Final Exam (TBD) | 45% |
| Homework | 12% |
| Participation | 3% |
| <hr/> Total | <hr/> 100% |

A. Quizzes 40% (30 minutes each; multiple choice questions on Canvas, no-look-back)

Note: No make-up quiz will be provided. Absence from the quiz will not be excused except for medical reasons supported by proper documentation submitted no later than 24 hours after the exam is taken. In that case, the weight of missed quiz will be counted towards the final.

- B. Final Exam 45% (100 minutes; comprehensive, i.e., covers all the materials with more weights on hypothesis testing and linear regression; multiple choice questions on Canvas, no-look-back)

The final exam date will be determined by the University. **If the final exam is missed without medical reasons supported by proper documentation (have to be submitted no later than 24 hours after the exam is taken), you won't pass the course.**

- C. Homework assignment 12%: there will be 4 Group HWs, each worth 3%.

- Stacy will send out announcements about the assignment of groups and the way of submitting HWs. **Late HWs will not be accepted.**
- **Free riding is not allowed.** If you don't join the discussion of HWs, other members of group have the right to submit HW without your permission, then your HW score will be 0. In addition, at the end of the semester, there will be peer evaluations from your group-mates. **If you have little contribution in the discussions, which will be reflected through low peer ratings, your HW grades will be discounted.**

- D. Performance through the curriculum

Your active participation is crucial for this class. Zoom automatically records the participants' online time for each session. **You can miss up to two classes without any excuses. But if you miss more classes without valid excuses sent to me, the teaching team will deduct points from the participation grades proportionally at the end of the semester.**

GRIEVANCE PROCEDURE

If you disagree with grades that have been assigned to your work, you have the opportunity to meet instructors within one week after the grades have been published on the course website. Please 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.

Tentative Class Schedule

| Part | Sessions | Date | Topics | |
|------|----------|---------|----------------------------|---------|
| I | 1 | Feb. 2 | Introduction | Lec. 1a |
| | 2 | Feb. 4 | Graphical techniques | Lec. 1b |
| | 3 | Feb. 9 | Numerical techniques | Lec. 1c |
| | 4 | Feb. 11 | Probability | Lec. 2a |
| | 5 | Feb. 16 | Conditional Probability | Lec. 2b |
| II | 6 | Feb. 18 | Discrete random variable | Lec. 3a |
| | 7 | Feb. 23 | Discrete random variable | Lec. 3a |
| | 8 | Feb. 25 | Discrete random variable | Lec. 3a |
| | 9 | Mar. 2 | Continuous random variable | Lec. 3b |
| | 10 | Mar. 4 | Continuous random variable | Lec. 3b |
| | 11 | Mar. 9 | [Exam I] | |
| | 12 | Mar. 11 | Sampling distribution | Lec. 4a |
| | 13 | Mar. 16 | Sampling distribution | Lec. 4a |
| | 14 | Mar. 18 | Confidence interval | Lec. 4b |
| | 15 | Mar. 23 | Confidence interval | Lec. 4b |
| III | 16 | Mar. 25 | Hypothesis testing I | Lec. 5a |
| | 17 | Mar. 30 | Hypothesis testing II | Lec. 5b |
| | 18 | Apr. 8 | [Exam II] | |
| | 19 | Apr. 13 | Hypothesis testing II | Lec. 5b |
| | 20 | Apr. 15 | Hypothesis testing III | Lec. 5c |
| IV | 21 | Apr. 20 | Simple Linear Regression | Lec. 6a |
| | 22 | Apr. 22 | Simple Linear Regression | Lec. 6b |
| | 23 | Apr. 27 | Simple Linear Regression | Lec. 6c |
| | 24 | Apr. 29 | Simple Linear Regression | Lec. 6d |
| | 25 | May 4 | Review I | |
| | 26 | May 6 | Review II | |