

# ISOM2500 (L4, L5) - 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

Room: LSK 5054A; Email: [lucyxia@ust.hk](mailto:lucyxia@ust.hk)

Office Hours: Tuesday 4:30pm-5:30pm; or send an email to make an appointment (zoom meeting for now, office meeting during mix-mode phase)

Instructional Assistant: Ms. Stacy Deng

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

Office Hours: Thursday 2:00pm-3:00pm; or send an email to make an appointment (zoom meeting for now, office meeting during mix-mode phase)

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:

L04: 9:00am – 10:20am Tue, Thu (Rm 2306)

L05: 3:00pm – 4:20pm Tue, Thu (Rm 2502)

### **REFERENCE BOOK**

Stine and Foster, “Statistics for Business: Decision Making and Analysis”, 2<sup>nd</sup> 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 19)	20%
Quiz 2 (April 15)	20%
Final Exam (TBD)	40%
Homework	20%
Total	100%

A. Quizzes 40% (30 minutes each, short-answer questions)

Note: **No make-up quiz will be provided.** You can miss one quiz at most. **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, meaning that the weight on your final will be 60%.

B. Final Exam 40% (120 minutes, covers hypothesis testing and linear regression)  
The final exam date will be determined by the University. **If the final exam is missed, you won't pass the course. No make-up final exam will be provided.**

C. Homework assignment 20%: there will be 4 Group HWs, each worth 5%.

- 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. If you miss classes without valid excuses, the teaching team holds the right to deduct points at the end of the semester on a case-by-case scheme.

## **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. 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 grade 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. 20	Introduction	Lec. 1a
	2	Feb. 25	Graphical techniques	Lec. 1b
	3	Feb. 27	Numerical techniques	Lec. 1c
	4	Mar. 3	Probability	Lec. 2a
	5	Mar. 5	Conditional Probability	Lec. 2b
	6	Mar. 10	Discrete random variable	Lec. 3a
	7	Mar. 12	Discrete random variable	Lec. 3a
	8	Mar. 17	Discrete random variable + Game	Lec. 3a
	9	Mar. 19	[Exam I]	
II	10	Mar. 24	Continuous random variable	Lec. 3b
	11	Mar. 26	Continuous random variable	Lec. 3b
	12	Mar. 31	Sampling distribution	Lec. 4a
	13	Apr. 2	Sampling distribution	Lec. 4a
	14	Apr. 7	Confidence interval	Lec. 4b
	15	Apr. 9	Confidence interval	Lec. 4b
	16	Apr. 14	Game + Hypothesis testing I	Lec. 5a
	17	Apr. 16	[Exam II on April 15]	
III	18	Apr. 21	Hypothesis testing II	Lec. 5b
	19	Apr. 23	Hypothesis testing II	Lec. 5b
	20	Apr. 28	Hypothesis testing III	Lec. 5c
IV	21	May 5	Simple Linear Regression	Lec. 6a
	22	May 7	Simple Linear Regression	Lec. 6b
	23	May 12	Simple Linear Regression	Lec. 6c
	24	May 14	Simple Linear Regression	Lec. 6d
	25	May. 19	Review	