

BUSINESS STATISTICS (ISOM 2500) (L4), FALL 2020

Instructor: Prof. Xinghua Zheng

Email: xhzheng@ust.hk

Lectures: Mon 13:30 - 14:50 & Fri 9:00 - 10:20

Instructor's office hours: Thu, 14:00-15:00, and by appointment

TA: Mr. Anson TONG, imchtong@ust.hk; office: LSK 4049C

TA's office hours: Tue, 14:00 - 15:00, and by appointment

Lab sessions to help learn the software JMP, time TBA.

Course Materials

- Lecture notes and exercise questions are downloadable from course website (<https://canvas.ust.hk/>);
- Reference book: "Statistics for Business, Decision Making and Analysis", by R. Stine and D. Foster;
- Software: JMP.

Objectives and Intended Learning Outcomes

Course objectives: to understand the importance of *statistical thinking* to business and management; to learn useful tools for data analysis. We emphasize on

- (1) hands-on experiences on data collection and analysis through in-class games,
- (2) closer connection to real life and business practice,
- (3) concepts and interpretation over computation through different formats of evaluation.

Evaluation

Your course grades are based on the following components:

- A. Assignments 10%.
- B. Quizzes 45%. Two quizzes. *Quiz I: Oct 13, 7:30-8:40pm; Quiz II: Nov 10, 7:30-8:40pm.* You can miss at most one quiz with medical certificate on the quiz day, in which case *you can take an **oral** make-up quiz within one week of the original quiz date.*
- C. Final exam 35%.
 - * **Quiz and exam format: multiple choice questions. Online. Check "Sample Quiz" in Canvas.**
- D. Participation 10% (6 cards, 1 pt each; 4 pts for not undermining the classroom learning environment). Your participation is crucial for this class. You will be assessed by your contribution to the classroom learning environment. You will receive one card for
 - Answering questions (providing correct/relevant answers)
 - Initiating/Participating in discussions (asking relevant questions, answering classmates' questions, sharing your ideas etc)

Email our TA your name and student ID with subject "Card" for recording if you earn a card.

Course Organization

Part I. Introduction

- Course outline
- Data and Variation (Ch2 - Ch6)
 - Types of data, §2.1,2.2,2.4
 - Describing categorical data, §3.1-3.4
 - Association between categorical variables, §5.1-5.2
 - Describing numerical data, §4.1-4.4
 - Association between numerical variables, §6.1-6.3, 6.5

Part II. Probability

- Probability Model (Ch7 - Ch9)
 - Basic concepts of probability, §7.1-7.2
 - Independence, conditional probability, §7.3, 8.1-8.3
 - Random variable, mean and variance §9.1-9.4
- Association between Two Random Variables (Ch10)
 - Portfolios, joint probability, §10.1-10.2
 - Dependence between random variables, §10.3
 - Mean and variance of weighted variables, covariance, §10.4, 10.6
 - **Game I**

— Quiz I —

- Normal Probability Model (Ch12)
 - Normal random variable and normal Model, §12.1-12.2
 - Normal quantile plot, §12.3-12.4

Part III. Inference

- Sampling and Sampling Distributions (Ch13 - Ch14)
 - Concepts of population, sample and sampling, §13.1-13.2
 - **Game II**
 - Sampling distribution, §14.1
- Standard Errors and Confidence Intervals (Ch15)
 - Confidence interval for μ , §15.1-15.4
 - Determine the sample size, §15.5
- Statistical Hypothesis Testing (Ch16)
 - Concepts, §16.1
 - One sample z - and t - tests, §16.2 - 16.3

— Quiz II —

Part IV. Linear Regression

- Simple Linear Regression Model (Ch19 - Ch21)
 - Linear pattern of data, residual plot, §19.1-19.3,19.5,
 - Nonlinear pattern of data and transformation, §20.1-20.4
 - The model and conditions, §21.1-21.2
 - Inference in regression, §21.3
 - Prediction interval, §21.4

- Regression Diagnostics (Ch22)

- Detecting differences in variation, §22.1
- Outlier and influential points, §22.2
- Dependent errors and time series, §22.3

— **Final Exam** —

Absence from Final Exam

(Excerpted from https://www.ab.ust.hk/arr/reg/em/em_std_reg/reg_makeup.html) “Students who fail to attend a final examination as scheduled will be given zero mark for that examination. If the absence is due to extenuating circumstances beyond the student’s control, such as medical emergencies, he/she may apply to the Admissions, Registration and Records Office (ARRO) within one week from the missed examination for a make-up examination to be held. For absence due to medical reasons, the student is required to submit certification issued by a registered medical practitioner. Appropriate documentation will be required for absences due to other reasons.

The ARRO will decide, in consultation with the Office of the Provost and the Department/Course Instructor concerned, whether the student’s application should be approved. The student will be notified of the result of the application within one week from the date the application is lodged with ARRO. The make-up examination will be held within five weeks after the regular examination period. The format of the make-up examination will be decided by the course instructor concerned.”

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 students, or tempering with the academic work of other students. 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:
(excerpted from <http://www.ust.hk/vpaao/integrity/student-5.html>)
“If you are discovered cheating, however minor the offence, your transcript will carry a notation of academic dishonesty. This notation stays with your record until graduation. If you cheat again, you will be dismissed from the University. In serious cases, your department may ask the Student Disciplinary Committee to look at the case. The Student Disciplinary Committee can require you to do campus community service; take away your eligibility for a degree with honors, or scholarships and prizes; suspend you from the University, or simply dismiss you right away.”