

DONGGUAN UNIVERSITY OF TECHNOLOGY

School of Economics and Management

Course Syllabus

Spring 2019

Course Information

Course Code	088364
Course Title	Probability Theory and Mathematical Statistics
Instructor	Chih-Yuan Hung
Class	2017 Economics and Finance (Financial Management Industry-University International Program)
Course Category	☒ Compulsory ☐ Elective
Credit(s)	3
Total Hours	54
Hours per week	3
Hours of Experiment	0
Classroom	1309 Guancheng Campus
Time	Wednesday, 14:30-17:10
Office Hour	Wednesday 10:00-12:00 at 3207 Guancheng Campus; by appointment
Required Textbook	Miller & Miller. <i>John E. Freund's Mathematical Statistics (8th Edition)</i> . Pearson Education, 2014.
Supplementary Materials	➤ DeGroot, Morris H. and Schervish, Mark J. <i>Probability and Statistics (4th Edition)</i>. Pearson, 2014; China Machine Press, 2017. ➤ Taleb, Nassim Nicholas. <i>Fooled BY Randomness</i>. Random House, 2001. (中文版:《随机漫步的傻瓜》) ➤ Ellenberg, Jordan. <i>How Not to Be Wrong: The Power of Mathematical Thinking</i>. Penguin Books, 2015. (中文版:《魔鬼数学》)
Prerequisites	Advanced Mathematics B, Statistics
Course website	Hung's website for Probability

Assessment and Grading

	Standards	Notes
Attendance	If you are late or leave early, your grade	If you are taken more

10%	will be taken one point each time. If you are absent for one class, the taken point will be 2 for each absentee. Give questions is a good way to get points in attendance.	than 10 points away, I will reserve your right to participate final exam.
Problem set 20%	Weekly problem sets, 8 points each. Complete one of the 8 questions by group. One of the groups is on duty who response for the editing of the answer. The score is grade by a standard of group working	
Midterm 20%	Questions for 100 points on the test paper and will be weighted to be 20% in your grade.	Closed book exam.
Final 50%	Questions for 100 points on the test paper and will be weighted to be 50% in your grade.	Closed book exam.

Course Description

This is an advanced course of Probability and Mathematical Statistics for the sophomores in the program of Financial Management in International Business. Probability is the fundamental knowledge for further studies in quantitative analysis. It deals with that what is a random event, how we measure the randomness and how we make the prediction. The course starts from counting principles and the axiom of probability. Then group things into what we call “distributions,” in order to figure out the patterns of random. Next, we construct some measures about the distributions and how these measures represent the population behind the distributions. Finally, we dig deeper into the statistical inference, which include estimation, hypothesis testing and analysis of linear models.

Course Objectives

Our goal is to introduce a more rigorous way of statistical thinking. After that you can

- Well understood probability theories and concepts.
- Apply probability theories/concepts to analyze, predict, and estimate for a statistical issue.
- Present statistical data and inference.
- Improve your self-awareness of the data, randomness, and skills that affect your performance in statistical contexts.

Course Expectations

1. Attendance - Class attendance is expected of all students. Especially for the experimental sessions, no miss of any experiment is the bottom line. For other cases, please notify me or the class TA before the day of an anticipated absence. Failure to attend class regularly or frequent tardiness will mean automatic loss of your attendance mark.
2. English - You are highly encouraged to speak English in the class and actively exchange your ideas, opinions and critical thinking with others. Make sure to speak English even during small-group or paired activities.
3. Before/After Class - Students should expect to spend an adequate amount of time on reviewing the textbook, course handouts and finalizing the group homework before the due day. To keep up with the flow of the course, students are strongly recommended to complete the relevant reading materials and to have the coming individual/group presentations/activities conscientiously prepared before the class.
4. Class Participation - Class participation is an essential part of the learning process. Students will be evaluated on the quality your individual/group performance, your team spirit and your contributions to the class/group activities by your peers or the lecturer correspondingly.
5. Late assignments will be accepted without penalty only in cases of legitimate absences and only if the student has contacted the lecturer or the TA in advance regarding the reasons for the late assignment. If you miss a class, you must get previous class material from one of your student contacts.
6. Please be considerate of your fellow students during class presentations. Talking during the presentation will result in a 1% deduction from your final grade.

Course Schedule

Week/Date	Topic	Required Reading
1/Feb. 27	Introduction (Combinatorial Analysis)	Chapter 1
2/Mar. 6	Combinatorial Analysis II	Chapter 1
3/Mar. 13	Probability: Definition	Chapter 2
4/Mar. 20	Conditional Probability and Bayes' Theorem	Chapter 2
5/Mar. 27	Probability Distributions	Chapter 3
6/Apr. 3	Probability Densities	Chapter 3
7/Apr. 10	Mathematical Expectation	Chapter 4
8/Apr. 17	Moment-Generating Functions and Conditional Expectations	Chapter 4
9/Apr. 24	Regression and Correlation	Chapter 14

10/May 1	Labor's Day	
11/May 8	Midterm Exam	
12/May 15	Special Probability Distributions	Chapter 5
13/May 22	Special Probability Densities	Chapter 6
14/May 29	Point Estimation I: unbiased and efficient estimator	Chapter 10
15/Jun. 5	Point Estimation II: Method of Moment and MLE	Chapter 10
16/Jun. 12	Hypothesis Testing I: the criteria	Chapter 12
17/Jun. 19	Hypothesis Testing II: Power and Likelihood Ratio Tests	Chapter 12
18/Jun. 26	Review Session	Review for final exam

Date: 2019.3.4

Approved

Reviewed by

Bitao Shi

Signature

BITAO SHI

Director of

Department of International Business and Management