Capital University of Economics and Business
Overseas Chinese College
Course Syllabus

Year and Semester	Spring					
Course Name	Probability & Statistics					
Course Code	MAT231					
Course Type	☑General Education (Required) ☐General Education (Elective) ☐Basic Disciplinary Course ☐Professional Course (Required) ☐Professional Course (Elective) ☐Professional Course (Expanded) ☐Professional Course (Advanced)					
Course Credits	4					
Course Hours	Total Class Hours	64	Lecture Hours	64	Experiment (Computer) Hours	0
Applicable object	☐ Freshman ☑ Sophomore ☐ Junior ☐Senior					
	☑ Business Administration (Accounting)					
	☑ Information Management and Information Systems (Finance)					
Prerequisites	MAT111 Calculus I & II, MAT221					
Instructor	Prof. Jianming Huang, Prof. Lemon Li, Prof. Leilei Zhu					
Contact Information	010-83961072					
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Office Hour	TBA					
Learning Centre	TBA					
Grade/Section	2023BA1/BA2/IT/ACCA1/ACCA2/CFA					
Course Time/Place	2023BA1 M/TH 67/34 B113, 2023BA2 W/F 34/67 A204/A101, 2023IT T/F 67/34 5#111, 2023ACCA1 W/F 12/67 5#206, 2023 ACCA2 T/F 12/34 5#208, 2023CFA T/F 12/34 A109					
Textbook	毛纲源 徐丽莉，*Probability and Statistics*, 华中科技大学出版社， ISBN 978-7-5680-2829-5					

Reference Book

1. M. R. Spiegel. Schaum. Outline of Theory and Problems of Probability and Statistics. McGrawHill, New York.
2. Anton, Bivens & Davis. Calculus (Seventh Edition). John Wiley & Sons, Inc(2002). ISBN: 0-471-38157-8

Course Description

An introduction to probability theory and mathematical statistics that emphasizes the probabilistic foundations required to understand probability models and statistical methods. The purpose of Probability and Statistics For Engineering and Science is to provide students with comprehensive introduction to statistical models and methods most likely to encountered and used by students in their careers in engineering and the natural sciences. The course is applications-oriented and topics covered will include the probability axioms, basic combinatorics, discrete and continuous random variables, probability distributions, mathematical expectation, common families of probability distributions, and the central limit theorem, which help decision making in all world.

Student Learning Objectives

After completing this course, students will be able to:

Knowledge:

- Describe the theory of probability, both discrete and continuous, including some combinatorics, a variety of useful distributions, expectation and variance, analysis of sample statistics, and central limit theorems
- Interpret basic theories and methods of probability and statistics.
- Apply the basic theories and methods of probability and statistics to simple problem solving.
- Be prepared for further study in statistics.

Capability:

- Develop the ability to solve problems using probability and statistics. ♦ Develop skills and work problems involving integral calculation
- Construct abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to basic probability and statistics
- Create connections between probability and other branches of mathematics. Mindset:
- Develop the quality and morals of being objective, integrity and dedication.
- Perceive the world with some probabilistic and statistical philosophical view.
- Realize the generalizability of Marxist philosophy.

Website Source

1. Charles M. Grinstead and J. Laurie Snell's textbook Introduction to Probability: http://www.dartmouth.edu/~chance/teaching_aids/books_articles/probability_book/book.html, an on-line textbook on probability and statistics.
2. The Chance Website: http://www.dartmouth.edu/~chance/index.html The goal of Chance is to make students more informed, critical readers of current news stories that use probability and statistics.
3. Math Archives. Probability: http://archives.math.utk.edu/topics/probability.html. Statistics:

http://archives.math.utk.edu/topics/statistics.html

4. The Probability Web: http://www.mathcs.carleton.edu/probweb/probweb.html

Teaching Methods

This course consists of lectures, discussions and student presentations. Students will be divided into small groups with a group leader helping others in the group. Students must be prepared to finish some small questions and small quizzes during the class.

Grade Criterion

Component	Weight	Description
Final Exam	20%	A cumulative final examination will be given based on all of the contents of the class. A minimum of 25% of the exam (5 of the 20%) will consist of questions utilizing the application of critical thinking.
Mid-Term Test	20%	A cumulative midterm examination will be given based on all of the contents of the first half of the class. A minimum of 25% of the exam (5 of the 20%) will consist of questions utilizing the application of critical thinking.
Homework	15%	Homework problems will be assigned throughout the term, including but not limited to: terminologies, research project, and reading assignments.
Quizzes	15%	There will be at least 2 quizzes during the semester. The purpose of the quizzes is to ensure that students keep up with the readings. It may also be used as a way to check the attendance. Quizzes will test your knowledge of both concepts and the application of those concepts.
Presentation	10%	The students will be divided into several groups to prepare a presentation. Each student is required to be involved in the presentation. The topics can be selected from the textbook or lectures. Each group need to finish a PPT related to the topic which is given and hand in the related resources to the teacher before the presentation. The percentage is : content50%+organization10%+language15%+performance25%
Participation	10%	Individuals will be asked to participate individually in questions during the semester. Students are required to meet with their teachers every week. Their performances should be counted in their participation.

Attendance	10%	Refer to attendance policy listed below
Total	100%	

Detailed Grade Computation

	Before Midterm	After Midterm
Attendance	5%	5%
Participation	5%	5%
Homework	5%	10%
Quizzes	5%	10%
Presentation		10%
Midterm test	20%	
Final exam		20%
Total	40%	60%

Assessment of Student Performance

☞ ***Self-Study and Reading ability Practice***

Instructor will give out the chapters or the reference books to read and use class hours to have discussion; students should be able to show a proactive attitude and ability for self-study and reading. Knowledge and oral English will be elements of homework or presentation score.

☞ ***Homework***

Students should finish their homework by themselves. Copying from others will be treated as cheating and the homework scores will be lowered. Students should hand in all assignments on time. Late assignments will be accepted at the discretion of the instructor (i.e., when the student was ill or had an excused absence). Late assignments without reasonable proof will be reduced in score by 50%.

☞ ***Attendance***

Because the course covers a great deal of material, attending every class session is very important for performing well.

- Being late for 15 minutes or more is considered an absence.
- Five hours or above of unexcused absences will result in the lower level of the final grade by one grade band (e.g. from C – to D +). Any excused absence must be discussed directly with the teacher.
- Absence which is more than 1/3 of the total teaching hours will cause an F (a failing grade) directly, but students are welcome to continue attending classes.
- An incomplete grade (I) will be considered in case of medical or family emergencies.

☞ ***Participation***

- Students should participate in classes actively. Half of participation grade is determined by their presentation in class. They are encouraged to ask questions relevant to the subject and express their own opinions. Every student should respect the ideas, opinions, and questions of their classmates.
- Students should also use office hours to ask questions or talk with the instructor for good communication and effective learning.
- Frequent visiting the instructor and chatting in English during office hours is highly recommended.
- Any misbehavior and non-class related activities in class will result in the lower level of the participation grade, including ringing cell phones.
- All above behaviors will be solely evaluated by the instructor for scoring.

☞ ***Textbook***

Students must bring the textbook to class.

Topical Course Outline

		Topics	Homework
1	1	● Syllabus ● Statistics, Data & Statistical Thinking Introduction ● Graphical Descriptive statistics and interpretations of data	

	2	● Numerical Descriptive statistics and interpretations of data	
2	1	● Random events and sample spaces ● Properties of probability ● Counting techniques	
	2	● Conditional probabilities	
3	1	● Bayes formula ● Theorem of the total probability	
	2	● Independent events	
4	1	● Random variables ● Discrete random variables and their probability distributions	
	2	● Expected value and variance ● Expectation of a Function of a Random Variables	
5	1	● The binomial distribution probability distributions	
	2	● The Poisson distribution Continuous random variables and their distributions	
6	1	● Distributions of a function of continuous variables ● Expected values and variance	
	2	● The uniform and uniform distributions	
7	1	● The exponential distribution ● Statistics and their distributions	
	2	● The distribution of the sample mean ● The distribution of a linear combination	
8	1	● Point estimation ● General ideas of point estimation ● The moment estimation views	
	2	● The maximum likelihood estimation	
9	1	● Review	
	2	● Midterm Exam	
10	1	● Confidence Interval ● Introduction of confidence intervals ● Interpretations of CI	
	2	● Large-sample confidence interval for population mean and proportion	

11	1	● Intervals based on a normal distribution	
	2	● Intervals based on a t distribution ● Case study	
12	1	● Hypothesis testing ● Hypotheses testing procedures	
	2	● Test about a population mean	
13	1	● Test concerning a population proportion	
	2	● p-values	
14	1	● Presentations	
	2	● Presentations	
15	1	● Presentations	
	2	● Quiz 2 & Review	
16	1	● Review	
	2	● Review	

Note: *Some chapters or sections may leave for self-study, this is the students' duty to learn and understand, they may also be included in the quizzes or exams.*

A review in Chinese may be held during L.C. and O.H. in the semester.

Teacher's Office Hour

- The instructor's office hour is shown in the front of the office door.
- Students are suggested to use the instructor's office hour and learning center to ask questions or talk with the instructor once at least per week for good communication and effective learning, which is recorded in the students' participation.
- The time can be scheduled by instructors or students, or both.

Cheating and Plagiarism

Cheating is not tolerated. Any student caught cheating on a quiz; test or exam will be given a mark of zero (0) for the particular work. At the beginning of the semester the definition of plagiarism will be carefully explained, when any thoughts or writings of another person are used, they must be clearly identified (usually one uses quotation marks) and the source notes. **If any student is caught cheating on any homework assignment, the highest score the student can earn in that course is a "C".**

Important Dates

Midterm Test	Week 9 or 10
Final Exam	Refer to the notice of the Academic Affairs Office

Note: *This syllabus is tentative and may be changed or modified throughout the semester. All students will be notified and a new syllabus will be given.*

Instructor: _____ Department Head: Prof. Jingning Li