Capital University of Economics and Business
Overseas Chinese College
Course Syllabus

MAT 231 Syllabus

Semester and Year **2018 Spring (March 5,2018-Jun 22,2018)**

Course Name **Probability and Statistics**

Course ID **MAT231**

Section **Y04**

Course Credits **4**

Instructor **Prof.M.Li**

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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 *Statistics for Business and Economics* is to provide students, primarily in the fields of business administration and economics, with a sound conceptual introduction to the field of statistics and its many applications. 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

- To provide students with a good understanding of 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, as described in the syllabus.
- To help students develop the ability to solve problems using probability.
- To introduce students to some of the basic methods of statistics and prepare them for further study in statistics.
- To develop abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to basic probability.
- To make connections between probability and other branches of mathematics, and to see some of the history of probability.

Textbook

JAY L.DEVORE, Probability and Statistics, ISBN: 978-7-04-015560-0.

Library Source

Students can find reference books in the library or related materials on the Internet.

Reference materials

- M. R. Spiegel. Schaum's outline of theory and problems of probability and statistics. Schaum's outline series. McGraw-Hill, New York, 1975.
- L. Blank. Statistical procedures for engineering, management, and science. McGraw Hill, New York, 1980.
- K. Subrahmaniam. A primer in probability, volume 111 of Statistics: textbooks and monographs. Marcel Dekker, New York, second edition, 1990.
- W. Feller. An introduction to probability theory and its applications. Wiley series in probability and mathematical statistics. Wiley, New York, third edition, 1967-1968.
- N. C. Giri. Introduction to probability and statistics (in two parts), volume 7 of Statistics: textbooks and monographs. Marcel Dekker, New York, 1974.
- Y. G. Sinay. Probability theory, an introductory course. Springer-Verlag, Berlin; New York, 1992.

Some websites

- 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.
- 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.
- Math Archives. Probability: http://archives.math.utk.edu/topics/probability.html.
  Statistics: http://archives.math.utk.edu/topics/statistics.html
- The Probability Web: http://www.mathcs.carleton.edu/probweb/probweb.html

Teaching methods

This course consists of lectures, discussions and individual presentations. Students must be prepared to finish some small questions and small quiz during the class. After each chapter there will be some mini presentations which should be held by individuals.

Grade criterion:

Component	**Weight**	**Description**
Final Exam	20%	A cumulative final examination will be given based on all of the contents of the class
Mid-Term Quiz	20%	A cumulative Mid-Term Quizination will be given based on all

		of the contents of the first half of the class.
Homework	15%	Homework problems will be assigned throughout the term, including but not limited to: terminologies, research project, and reading assignments.
Quiz	15%	There will be several times quizzes during the semester. The purpose of the quizzes is to ensure that students keep up with the readings.
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.
Presentation	10%	Refer to the handouts.
Attendance	10%	Refer to attendance policy listed below.
Total	100%	

Note: Presentation should be individual work. Students will be selected randomly for their presentation and the evaluation will include their performance, command of language and thinking logic.

Detailed Grade computation

In a semester, the grade of attendance, participation, assignment/homework, and quiz accounts 60 percent in final grade, the Mid-Term Quiz and final exam accounts 20 percent in final grade, respectively. 40 percent before midterm, and 60 percent after midterm. That is shown as in the following table:

	Before midterm	After midterm
Attendance	5%	5%
Participation	5%	5%
Homework/assignment	5%	10%
Quiz	5%	10%
Mid-Term Quiz	20%	
Final exam		20%
Presentation		10%
Total	40%	60%

Grading Policy

A+ 100-95 A 94-90 A- 89–87

B+ 86-83 B 82-80 B- 79–77

C+ 76–73 C 72-70 C- 69–67

D+ 66–63 D 62-60 F 59-0

Quiz/Exam Schedule

Midterm Quiz: May 5-May 11

Final Exam: June 25-June 29

Homework

Students should finish their homework (except for group projects) by themselves. **Copying from others will be treated as cheating. Students' homework scored will be lowered.** Students should hand in all assignments promptly and on time. Late assignment will be accepted at the discretion of the instructor (i.e., when the student was ill or had an excused absence). Assignment turned in late without proof of illness or had an excused absence will be reduced in score by 50%.

Assignment should be printed out. Anything that cannot be read will be marked wrong. Printing requirements are as followed: single space between lines, double space between paragraphs, font size is 12 (maximum). Grammar error can reduce 20% of your score.

Attendance

Being late for 15 minutes will result in unexcused absence. Each unexcused absence will result in 10% reduction of attendance grade. Five hours of unexcused absences will result in the lowering of grade by one level, i.e. A to A-. 30 hours (30% of total class hours) of absences under any circumstances forces a withdrawal from the course and get a grade of "F". An excused absence must be discussed directly with the teacher. An incomplete grade (I) will be considered in case of medical or family emergencies. **Students should attend class with their textbooks.**

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 hour to ask questions or talk with the instructor for good communication and effective learning. Any misbehavior and non-class related activities in class will result in the lowering of the participation grade, including ringing beepers and cell phones. Student better frequent visit their instructors and chat in English everyday. All above behaviors will be solely evaluated by the instructor for scoring.

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.

Topical Course Outline

Week Index	Content
Week 1 **March 5-March 9**	Syllabus Statistics, Data & Statistical Thinking Introduction Random events and sample space Permutations and Combinations Multinomial Coefficients
Week 2 **March 12-March 16**	Probability Theory （relationship） Sample spaces having equally likely outcomes Exercise/Case/Individual Presentation/Free Talk/Movie
Week 3 **March 19-March 23**	Introduction to Probability More Probability Conditional probabilities Bayes formula Independent events
Week 4 **March 26-March 30**	Probability Theory Theorem of the total probability Application of probability theory Exercise review
Week 5 **Apr 2-Apr 6**	Random Variables Discrete Random Variables and Their Probability Distributions
Week 6 **Apr 9-Apr 13**	Expected Value Expectation of a Function of a Random Variables Variance Conditional Expectation Conditional Distributions
Week 7 **Apr 16-Apr 20**	Continuous Probability Continuous Random Variables and Their Probability Distributions Distributions of a Function of Continuous Variables Some Distributions
Week 8 **Apr 23-Apr 27**	Expectation of a Function of Continuous Variables Variance Exercise
Week 9 **Apr 30-May 4**	**Quiz** **Review for Mid-Term Quizination**

Week 10 **May 7-May 11**	**Mid-Term Quiz**
Week 11 **May 14-May 18**	Conditional Density Functions Sampling Distributions Normal Distribution Interactive activities: Exercise/Case/Individual Presentation/Free Talk/Movie
Week 12 **May 21-May 25**	Sampling Distributions Continued Limit Theorems Law of large numbers
Week 13 **May 28-June 1**	Definition of statistics
Week 14 **June 4-June 8**	Definition of Interval Estimation Application of Interval Estimation Definition of Point Estimation Application of Point Estimation
Week 15 **June 11-June 15**	Tests of Hypothesis Interactive activities: Exercise/Case/Individual Presentation/Free Talk/Movie
Week 16 **June 18– June 22**	Statistical Inference about Means and Proportions With Two Populations: Confidence Intervals & Tests of Hypotheses F-test: Exercise/Case/Individual Presentation/Free Talk/Movie
Week 17 **June 25– June 29**	Final Examination

Note: Self-Study contents will be also included in your quiz and examinations.

Teacher's Office Hour

The instructor's office hour is shown in the front of the office door. Students are required to use the instructor's office hour 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.

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.*

2017-2018 Academic Calendar

Spring Semester, 2018 March 4, 2018— July 20, 2018

Mar.4	Registration
Mar.5	Classes Begin
Mar.16	Last Day to Drop or Add a Course
Apr.5	Qingming Festival (tentative)
Apr.20	Spring Sports (tentative)
May 1	Labor Day Holiday (tentative)
May.7 -11	Mid-Term Quizs
May 14-18	Summer School Registration (tentative)
June 18	Duanwu Festival (tentative)
June 25-29	Sophomore and Junior students' Final Exam
July 2-20	Sophomore and Junior students' Social Practice，Summer School
July 16-20	Revision and Final Exam Period
July 23	Summer Vacation Begins