Capital University of Economics and Business
Overseas Chinese College
2017-2018 Academic Year Spring Semester

MAT 231 Syllabus

Semester and Year	Spring Semester March 5, 2018-June 22, 2018
Course Name	Probability & Statistics
Course ID	MAT231
Section	Y01/02
Course Credits	4
Instructor	Prof. Jake Huang
E-mail:	huangjianming@cueb.edu.cn
Contact Information	Office Room: C217, Telephone: 8395 1082
Office Hour	M15:30-17:30, W15:30-17:30, Th8:00-10:00
Learning Center	M 18:00-20:00, T15:30-17:30

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

- 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.

References

- 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:

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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.
Midterm exam	20%	A cumulative midterm 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.
Quiz	10%	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	15%	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 the semester, the grade of attendance, participation, assignment/homework, and quiz accounts for 60 percent in the final grade, each of the midterm exam and final exam accounts for 20 percent in the final grade. 40 percent of the final grade is before midterm, and 60 percent after midterm, as shown in the following table:

	Before midterm	After midterm
Attendance	5%	5%
Participation	5%	5%
Homework/assignment	5%	10%
Quiz	5%	5%
Midterm exam	20%	
Final exam		20%
Presentation		15%

Total	40%	60%

Grading Policy

A+ 97-100	A 93-96	A- 90–92	B+ 87-89	B 83-86	B- 80–82
C+ 75–79	C 70-74	C- 67–69	D+ 63–66	D 62-60	F 0- 59

Exam Schedule

Midterm: May 7 – May 11, 2018

Final: July 16- July 20, 2018

Homework

Students should finish their homework (except for group projects) by themselves. **Copying from others will be treated as cheating. Students' homework score 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.

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	Syllabus Statistics, Data & Statistical Thinking Introduction Descriptive statistics and interpretations of data **Minitab--Descriptive Statistics**
Week 2	Random events and sample space Properties of probability Counting techniques Conditional probabilities
Week 3	Bayes formula Independent events Theorem of the total probability
Week 4	Random variables Discrete random variables and their probability distributions Expected value and variance Expectation of a Function of a Random Variables
Week 5	The binomial distribution The Poisson distribution **Minitab--Discrete Probability Distributions** Continuous random variables and their probability distributions
Week 6	Distributions of a function of continuous variables Expected values and variance The uniform distribution The normal distribution
Week 7	Statistics and their distributions The distribution of the sample mean The distribution of a linear combination **Minitab--Continuous Probability Distributions and Sampling**
Week 8	General ideas of point estimation The moment estimation The maximum likelihood estimation **Minitab--Point Estimation**

Week 9	Chinese Review Sessions Quiz 1 and Revision
Week 10	**Midterm**
Week 11	Introduction of confidence intervals Large-sample confidence interval for population mean and proportion Intervals based on a normal distribution
Week 12	Confidence interval for the variance and standard deviation of a normal distribution **Minitab--Confidence Interval** Hypotheses testing procedures
Week 13	Test about a population mean Test concerning a population proportion p-values **Minitab--Hypotheses Testing**
Week 14	Single-Factor ANOVA Multiple Comparisons in ANOVA
Week 15	Chinese Review Sessions Revision and Quiz 2
Week 16	Presentations
Week 17	**Final**

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.

Important Dates

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

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Mar. 4	Registration
Mar. 5	Classes Begin
Mar. 16	Last Day to Drop or Add a Course with no Charge
Apr. 5	Qingming Festival (tentative)
Apr. 20	Spring Sports (tentative)
May 1	Labor Day Holiday (tentative)
May 7-11	Midterm Exams
May 14-18	Summer School Registration
June 18	Duanwu Festival (tentative)
June 25-29	Sophomore and Junior students' Final Exam
June 2- July 20	Sophomore and Junior students' Social Practice Summer School
July 16-20	Revision and Final Exam Period
July 23	Summer Vacation Begins

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.*