The Beijing Center

北 京 中 国 学 中 心

Spring 2021
TBC 1610 Fundamentals of Statistics

Credit Hours: 3.0
Class Times and Location: TBA
Instructor: TBA
E-mail: academics@thebeijingcenter.org

Course Description

An introduction to statistical reasoning. Students learn how statistics has helped to solve major problems in economics, education, genetics, medicine, physics, political science, and psychology. Topics include: design of experiments, descriptive statistics, mean and standard deviation, the normal distribution, the binomial distribution, sampling, estimation and testing of hypothesis.

Learning Outcome

Statistics can be defined as the science of reasoning from data. Data and statistical thinking abound in everyday life and in almost all academic disciplines, so the ability to reason with data is essential to educated citizenship. This course will focus on understanding statistical concepts and reasoning; organizing, interpreting and producing data; analyzing statistical arguments and communicating findings clearly; and appreciating the relevance of statistics to contemporary society.

After successful completion of this course, students will be able to:
1. construct and interpret graphical and numerical summaries of data;
2. describe many of the fundamental ideas of statistics, such as variability, distribution, association, sampling;
3. describe how the nature of data collection methods affects the scope of the conclusions that can be drawn from statistical studies (especially cause and effect) the role of probability in sampling and experiments;
4. apply the normal distribution and the Central Limit Theorem;
5. comprehend the basics of statistical inference: estimation, assessing statistical significance, statistical reasoning, and apply and interpret the results of a variety of statistical techniques;
6. analyze and assess statistical arguments, such as those found in the popular press and scholarly publications;
7. communicate knowledge of statistical ideas effectively.

Textbook

- (Textbook) *Statistics*, James T. McClave and Terry T Sincich, Pearson, 2017, 13th Edition.

- (Software) *Excel* and *Stata 15* will be used for demonstration.

Course Requirements

1. Assignments & Exams

- *Weekly Assignment (20%)*
  Homework will be assigned regularly from the text, collected and graded. Clarity of exposition is important, and you should strive for well-written, polished solutions. Collaboration on homework with other members of the class is allowed most of the time, but solutions must be individually written up in your own words and collaborators should be acknowledged. I will make it clear when collaboration is not permitted. Each of the homework assignments will include reading from the text.

  Budget your time wisely, and start working on the homework as soon as it is assigned!

- *Midterms (40%)*
  Two midterms will be scheduled during the semester, each midterm accounts for 20%. *Midterm I* will cover chapters 1-4 and *Midterm II* will cover chapters 5-8. They will be close book written exams.

- *Final Examination (40%)*
  Written examinations. You will be allowed to bring in one piece, letter- or A4-sized cheat sheet for the test, so you when you study, you can focus on understanding the materials and can worry less about memorizing.

2. Attendance Policy
There will be NO makeup exam. You are only excused from attending the class with documented medical or family emergencies. Students who missed two of more classes shall be excluded from the class, and that will lead to a failing grade for the course.

3. Grading
A: 94% or above
A-:   90-93%
B+:   87-89%
B: 84-86%
B-:   80-83%
C+:   77-79%
C: 74-76%
C-:   70-73%
D+:   67-69%
D: 60-66%
F: Below 60%

4. Academic Honesty Statement
Please click the following link to see The Beijing Center's policy on Academic Integrity: http://thebeijingcenter.org/academic-integrity

Course Schedule

Date	Content	Remarks
Week 1	Introduction and Describing Qualitative and Quantitative Data	Chapter 1 and 2.1-2.3
Week 2	Averages, Variation and Correlation	Chapter 2.4-2.9
Week 3	Probability	Chapter 3
Week 4	Discrete Random Variables	Chapter 4
Week 5	Review and Midterm I	
Week 6	Continuous Random Variables	Chapter 5
Week 7	Sampling Distributions	Chapter 6
Week 8	Single Sample Inference: Confidence Intervals	Chapter 7
Week 9	Single Sample Inference: Hypothesis Testing	Chapter 8
Week 10	Review and Midterm II	
Week 11	Inferences Based on Two Samples	Chapter 9
Week 12	Simple Linear Regression	Chapter 11
Week 13	Statistical Analysis using Stata	
Week 14	Final Exam	