East China Normal University
International Summer Session

MAT 22 Introduction to Statistics

Term: July 5th –August 8th, 2018
Instructor: Dr. Edward Butz
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Course Description

Data Analysis: correlation & regression; Probability. Hypothesis Testing. Confidence Intervals. Regression. Analysis of Variance.

Course Overview

The ability to predict the future is a rare gift. Future events are never certain. The study of Statistics is an important, practical methodology for predicting future outcomes. Statistics begins with data from past events. By incorporating the element of randomness in a data set, Statistics is able to harness the power of probability theory to assess future scenarios. The challenge of "decision making under uncertainty" becomes a reasonable possibility.

Course Goals:

A student who satisfactorily completes this course should be able to

1. Evaluate mean, median, mode, standard deviation, variance of a data set
2. Evaluate correlation and regression line of paired data set
3. Understand basic probability rules
4. Compute probabilities from a Normal Distribution
5. Compute probabilities from a binomial Distribution
6. Understand Sampling Distributions
7. Hypothesis Testing: One & Two Sample Means
8. Hypothesis Testing: One & Two Sample Proportions
9. Understand Expectation in a Two-Way Table
10. Compute probabilities from a Chi-square Distribution

Required Text

Statistics
James T. McClave, Terry Sincich.—12th ed. (2013).
Pearson
ISBN 0-321-75593-6

Course Hours

The course has 25 class sessions in total. Each class session is 110 minutes in length, for a total of 2750 minutes of in-class time. The course meets from Monday to Friday from July 5 to August 8. ECNU awards 4 credits for this course. Different universities may count course credits differently. Consult officials at your own home institution.

Attendance

Summer school is very intense and to be successful, students need to attend every class. Occasionally, due to illness or other unavoidable circumstance, a student may need to miss a class. ECNU policy requires a medical certificate to be excused. Any absence may impact on the student's grade. Moreover, **ECNU policy is that a student who has more than 3 absences will fail the course. Arriving late or leaving early will count as a partial absence.**

Grading Policy

ECNU awards grades of A, A-, B+, B, B-, C+, C, D, and F. Most colleges and universities do not award transfer credit for grades of D or F.

In this course, grading will be based on the following:

Mid-Term Test	25%
Assignments	25%
Final Exam	50%

Percentage Interval	Letter Grade
[90,100]	A
[85, 89]	A-
[80,84]	B+
[75,79]	B
[70,74]	B-
[65,69]	C+
[60,64]	C
[50,59]	D
Below 50	F

General expectations:

Students are expected to :

- Attend all classes and be responsible for all material covered in class and otherwise assigned. Any unexcused absence may impact a student's grade. Moreover, ECNU policy is that a student who has more than 3 absences will fail the course. Arriving late or leaving early will count as a partial absence.

- Participate in class discussions and complete required written work on time.
- Refrain from texting, phoning or engaging in computer activities unrelated to class during class Students who do not do this will be asked to leave the class
- While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Course Schedules

The planned schedule sketched out below may be modified to suit the interests or abilities of the enrolled students or to take advantage of special opportunities or events that may arise during the term.

WEEK ONE **July 5 , 6**
Thurs Describing Distributions with Numbers, Descriptive Statistics
Fri The Normal Distribution

WEEK TWO
Mon Probability Models
Tues Random Variables
Wed General Probability Rules
Thurs Binomial Distribution
Fri Poisson Distribution

WEEK THREE
Mon Conditional Probability
Tues Bayes Theorem
Wed Applications of Bayes Theorem: Medical diagnostics
Thurs **MID-TERM TEST 25%**
Fri Confidence Intervals

WEEK FOUR
Mon Tests of Significance
Tues Inference for the Mean of a Population
Wed Comparing Two Means
Thurs Small sample tests: Student-t distribution
Fri Inference for a Single Proportion

WEEK FIVE:

Mon	Comparing Two Proportions
Tues	Correlation
Wed	Least Squares Regression
Thurs	Inference about the Regression Model
Fri	Inference about the Regression Model

WEEK SIX

Mon	Analysis of Two-Way Tables
Tues	Chi-Square Test
Wed	**Final Examination 50%**

Academic Honesty

Students are expected to maintain high standards of academic honesty. Specifically, unless otherwise directed by the professor, students may not consult other students, books, notes, electronic devices or any other source, on examinations. Failure to abide by this may result in a zero on the examination, or even failure in the course.