

Economics 306: Statistical Analysis
FALL 2005, TR 2:35 – 3:50
Furman Hall 209

Professor Cliff J. Huang
Office: Calhoun 212A
Office hours: TR 11:00 – 12:00

TA: Mr. Chih-Wei Wang
Office hours: W Th 5:00 – 6:30 in CL209

Textbook: Anderson, Sweeney, Williams, *Statistics for Business and Economics*, South-Western, 8th edition, 2002.

Audience: This is a course in statistics designed specifically for students in graduate program in economic development. Students are expected to make a commitment of at least 5 hours of study per week.

Tests: Three scheduled tests and several unannounced quizzes will be given in the semester. NO MAKE-UP test will be given unless it is an approved absence IN ADVANCE. All missed tests and quizzes are counted at zero.

Review Session: There will be a weekly review session. Time and place will be announced later.

Grading: Three tests: 70%; Quizzes: 30%.

Outline:

1. Introduction
 - Topics in statistics
 - Role of probability in statistics
2. Frequency distribution and histogram
 - Frequency distribution table
 - Histogram and polygon
3. Descriptive statistics
 - Central tendency: mean, median, mode, and percentile
 - Dispersion: range, interquartile range, variance, and standard deviation
 - Chebyshev's theorem
 - Covariance and correlation
4. Probability
 - Probability of an event
 - Conditional event and conditional probability
 - Rule of calculating probability: addition and multiplication rules
 - Statistical independent events
 - Techniques of counting: Permutation and combination
5. Sample space and probability distribution
 - Random variables and probability distribution
 - Characteristics of a probability distribution
 - Discrete distributions: Bernoulli, Binomial, and Poisson distributions

6. Continuous distributions
 - Continuous random variables and probability density
 - Continuous distribution: Uniform, and normal distributions
 - Normal approximation of Binomial probability
7. Sampling distribution
 - Sampling distributions of sample mean and sample variance
 - Central limit theorem
 - Sampling distribution of sample proportion
8. Statistical Estimation
 - Estimator vs. estimate
 - Criteria for a good estimator: unbiasedness, efficiency, and consistency
 - Point and interval estimation
9. Hypothesis tests
 - Type I and Type II errors of a decision making
 - Basic concept of hypothesis test
 - z-test and t-test of a population mean
 - Test of a population proportion
 - Operating characteristic curve
 - Setting of a hypothesis test
10. Inference about two populations
 - Sampling distribution of mean difference
 - Interval estimation of mean difference
 - Hypothesis test about mean difference
 - Matched sample and hypothesis test
 - Sampling distribution of difference between proportions
11. Inference about population variances
 - Sampling distribution of sample variance
 - Interval estimation and hypothesis test about population variance
 - Inference about two population variances
12. Chi-square distribution and Chi-square test
 - Test of difference among population proportions
 - Contingency table and test of independence
 - Test of goodness of fit
13. Nonparametric methods
 - Sign test
 - Wilcoxon signed-rank test
 - Mann-Whitney-Wilcoxon rank-sum U test

2005 Fall Class Schedule

Tuesday	Thursday
	(8/25) Ch 1: Introduction
(8/30) Ch 2: Histogram	(9/1) Ch 3: Mean, Variance
(9/6) Ch3: Variance	(9/8) Ch 4: Probability
(9/13) Ch 4: Probability	(9/15) Ch 4: Probability; Ch 5: Discrete distribution
(9/20) Ch 6: Discrete distribution	(9/22) Ch 6: Continuous distribution
(9/27) Ch 6: Continuous distribution	(9/29) First test (1 – 5)
(10/4) Ch 7: Sampling distribution	(10/6) Ch 7: Sampling distribution
(10/11) Ch 8: Estimation	(10/13) Ch 8: Estimation
(10/18) Ch 8: Estimation	(10/20) Ch 9: Testing
(10/25) NO CLASS	(10/27) NO CLASS
(11/1) Ch 9: Testing	(11/3) Ch 10: Testing
(11/8) Second test (6 – 9)	(11/10) Ch 10: Two populations
(11/15) Ch 11: Two populations	(11/17) Ch 11: Inference on variance
(11/29) Ch 12: Inference on variance	(12/1) Ch 12: Chi-square test
(12/6) Ch 12: Chi-squared Test Ch 19: Nonparametric methods	(12/8) Ch 19: Nonparametric methods
(12/14) Tuesday 9:00AM Third test (10 –12, 19)	