

Econ 230: Economic Statistics
SPRING 2002

Instructor: Shakeeb Khan

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Office Hours: Mondays 10:30-12:00, or by appointment.

Time and location: M, W 3:25-4:40, HH 115

Course Web Page: www.econ.rochester.edu/khan/e230.html

Teaching Assistants: Fernando Leiva Bertran, Damba Lkhagvasuren

Discussion Sections: Fridays, **1**)10:00-11:15 HH 114 **2**)TBA

Required Textbook:

Statistics for Business and Economics, Fourth edition, P. Newbold

Other Reference (on reserve)

Data Analysis with Microsoft Excel, K.N. Berk and P. Carey

Computer Package: Microsoft Excel will be used throughout the course to analyze statistical data. It is available on the machines in the cluster in Harkness 114.

Course Pre/Co-requisites: Math 141

Grading: There will be (sometimes) weekly assignments, 2 midterm exams (in class) and a final.

Scheme:

- Assignments - 20%
- Midterm Exams - 40%

- Final Exam - 40%

Dates:

- Assignments - Due at beginning of class, on specified date.
- Midterm Exams - Wednesday, February 20, 2002, 3:25-4:40, HH 115,
Wednesday, March 27, 2002, 3:25-4:40, HH 115.
- Final Exam - Tuesday, May 7, 2002, 19:15-22:15, HH 115;

Course Objectives

The course provides an introduction to basic probability and statistical theory for estimation and hypothesis testing, with emphasis on issues that arise when dealing with economic data. In the process, data analysis methods through the use of computer software will also be introduced.

Course Outline

1. **Introduction** (Chapter 1)

2. **Descriptive Statistics** (Chapter 2)

Measures of Location and Dispersion: mean, mode, median and other quantiles; range, variance, mean absolute deviation.

Graphical Methods: histograms, bar charts, scatter plots

3. **Elementary Probability Theory** (Chapter 3)

Basic Definition and Concepts of Probability: outcomes, events; probability postulates; permutations and combinations.

Rules and Laws of Probability: bivariate probabilities; Bayes' theorem.

4. **Random Variables and Probability Distributions** (Chapter 4, Chapter 5 Sections 1-5)

Discrete Random Variables: expected values; Bernoulli, binomial, hypergeometric, and Poisson distributions.; joint discrete probability distributions.

Continuous Random Variables: cumulative distribution and density functions; expected values; uniform, normal and exponential distributions; joint continuous probability distributions.

5. **Sampling Distributions** (Chapter 6, Sections 1-4, Chapter 5, Sections 6-7)

Random Sampling and Sampling Distributions: random sampling; sampling distribution of sample mean and variance.

The Central Limit Theorem: different CLT's; approximation to binomial and Poisson distributions.

6. **Estimation** (Chapters 7,8)

Point Estimation: unbiasedness; efficiency; comparing estimators;

Interval Estimation: confidence intervals; Student's t distribution; sample size.

7. **Hypothesis Testing** (Chapter 9)

Basic Concepts: null, alternative hypotheses; type I,II errors; power;

Specific Tests: population mean, population proportion, difference in means, variance.

8. **Nonparametric and Goodness of Fit Tests** (Chapters 10,11)

Nonparametric Tests: sign, Wilcoxon, Mann-Whitney tests.

Goodness of Fit Tests: goodness of fit tests; contingency tables.

9. **Correlation and Basic Linear Regression** (Chapter 12)

Correlation Analysis: correlation; rank correlation.

Simple Linear Regression Model: the method of least squares, measures of goodness of fit, hypothesis tests, prediction.