Course Description: Our goal in Eco. 45 is to develop an understanding of the basic tools of statistical analysis and to learn how to apply them to a wide variety of situations and data encountered in areas of business and economics. By the end of the semester you should be able to do the following:

1. Compute and interpret basic descriptive statistical measures;
2. Understand the basic concepts of probability and utilize elementary probability rules;
3. Apply techniques of statistical inference (estimation and hypothesis testing);
4. Work with measures of statistical association (correlation and regression);
5. Apply chi-square tests of goodness of fit


Other Materials: A pocket-calculator with statistical functions is helpful for working through homework programs. During exams however, you may only use a (non-programmable) four-function calculator. You can purchase one of these calculators at the L.U. Bookstore. Since we will be using EXCEL on occasion throughout the course, all students are expected to have passed the EXCEL competency examination.

Course Requirements: Grades will be based on midterm and final exams as well as analytical problem sets. For the problem sets only, you may discuss questions and answers with other students in the class, however, you must write up your own answers. Of course, no collusion is permitted when taking exams and quizzes.

Grade Distribution:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem Sets</td>
<td>15%</td>
</tr>
<tr>
<td>First Hourly Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Second Hourly Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>35%</td>
</tr>
</tbody>
</table>

Course Notes:

- Attendance
  - Class attendance is mandatory. Excessive absences will affect your grade for the course, so please be very careful to avoid missing any. We will be covering a considerable amount of material during each of the class meetings. Since most of the material is cumulative,
a missed class will put you very far behind in a very short time. If you must miss a class, please contact me beforehand.

- **Exams**
  - Exams are closed book, closed notes.
  - You must bring a simple calculator to quizzes and exams.

- **Attendance**
  - While attendance is not part of the final grade, you must be in class to participate and to learn the material.

- **Analytical Problem Sets**
  - Homework will be assigned weekly. I will distribute solution keys after the assignments are handed in.
  - Work each problem carefully and check where possible that you have arrived at the correct solution. Be sure to work logically through each problem and identify the basic steps associated with arriving at the solution. Please show your work. Finally, please ask for assistance at any time if you are having trouble with the assignment. A good idea is to review the assignment and begin working solutions to the problem set when it is assigned.
  - Assignments will be made available on Course Site and should be submitted in hardcopy in class.
  - I will drop the lowest HW grade at the end of the course before computing final grades.
  - **I do not accept late homework.**

**Academic Integrity:**

Lehigh University Student Senate Statement of Academic Integrity. “We, the Lehigh University Student Senate, as the standing representative body of all undergraduates, reaffirm the duty and obligation of the students to meet and uphold the highest principles and values of personal, moral and ethical conduct. As partners in our educational community, both students and faculty share the responsibility for promoting and helping to ensure an environment of academic integrity. As such, each student is expected to complete all academic course work in accordance to the standards set forth by the faculty and in compliance with the university’s Code of Conduct.”

**Academic Support Services for Students with Disabilities:**

Accommodations for Students with Disabilities: If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center 212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.
Course Outline:

Introduction & Frequency Distributions
Introduction to statistics
Frequency distributions
Visual representations of data

Reading: Chapters 1, 2

Descriptive Statistics
Measures of location, variability, and skewness
Standardizing data
The "empirical rule" and Chebyshev's theorem
Measures of association: covariance and correlation

Reading: Chapters 3

Introduction to Probability
Interpreting probabilities
Elementary probability rules
Bayes' rule
Counting techniques

Reading: Chapters 4

First Hourly Exam: Thursday, October 2

Probability Distributions
Random Variables
Expected Value
Discrete and continuous probability distributions

Reading: Chapters 5 & 6

Sampling and Sampling Distributions
Parameters and statistics
Random sampling
Sampling error
Sampling distributions
Unbiased estimators
The central limit theorem

Reading: Chapters 7
**Statistical Estimation**
Point estimation and sampling error for means and proportions
Confidence intervals
Appropriate sample size determination
The t-distribution

**Reading:** Chapters 8

**Hypothesis Testing**
One- and two-tailed tests of means and proportions
Type I and type II errors
Two-population tests

**Reading:** Chapters 9 & 10

**Second Hourly Exam: Thursday, November 6th**

**Chi-Square Analysis & Correlation Analysis**
Goodness-of-fit tests
Product-moment correlation coefficient
**Reading:** Chapters 12 (Section 12.3 only) & Chapters 3 (Section 3.5 only)

**Regression Analysis**
Simple linear regression
Standard error of estimate
Coefficient of determination
Inference in regression analysis

**Reading:** Chapters 14 & 15

**FINAL EXAM: TBD**
The final exam in cumulative