Economics 30330: Statistics for Economics
Department of Economics
University of Notre Dame
Instructor: Julio Garín
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When: Mondays and Wednesdays 8:00AM - 9:15AM.
Where: Edward J. DeBartolo Hall 208.
Office Hours: Mondays from 10:00AM to 11:30AM and Thursdays from 5:00PM to 6:30PM in Flanner Hall 536.

Course Description: The objective of this course is twofold. First, it will provide you with an introduction to statistics and basic probability so that you will become familiar with definitions, methods, and procedures that will help you to have a better understanding of statistics presented in the media and in basic research. Second, it will also prepare you for advance courses in Economics, particularly Econometrics.

This course presumes knowledge of both elementary algebra and differential calculus.

Required Course Materials:

1. *Essentials of Statistics for Business and Economics*, Anderson, Sweeney, and Williams (ASW), Sixth Edition. South-Western.

2. Access to a computer with either Microsoft Excel with Data Analysis toolbox, or STATA, or R.

Optional Reference Book:
Mathematical Statistics with Applications, Wackerly, Mendenhall, and Schaffer (WMS), Seventh Edition. Brooks/Cole.

What is Expected: Unless you have a legitimate excuse (family or health related emergency, NCAA athletic competition away, and job interview), *you need to attend class, arrive on time, and not leave early*. Projects or assignments for other classes are not acceptable excuses for missing class. If for some reason you are not able to come to class or you have to come late or leave early you need to contact me before class and let me know. When you must miss a class it is your responsibility to get the assignments from me or a classmate. Poor attendance will surely contribute to a low grade. I will be more than happy to help you with course material on a 1-to-1 basis as long as you attend class and put forth the proper effort.

There will be no makeup exams except for those instances contemplated by the University Academic Guide. If you have a valid excuse you need to let me know within 24 hours of the missed exam. The instances that are contemplated by the Academic Guide can be found in under the policy for Class Attendance (basically the same as before: family or health related emergency, NCAA athletic competition away, and job interview).

Except when mentioned, *you are expected not to use electronic devices in the class.* That means that you should not be using any device that either starts with an 'i', has a lcd screen, or both. If you usually take your notes in a laptop, talk to me.

Last but not least, *you are expected not to engage in academic dishonesty.* Remember, one of the goals of this course is to prepare you to do well in advance classes, so it is essential that you do not take shortcuts. In this sense, while collaboration in small groups in doing homeworks is permitted in this course, copying is not. Therefore, problem sets, examinations, and the research project are conducted under the University of Notre Dame's Academic Code of Honor.

Grading and Important Dates: Lectures are important, but in statistics, so is practice. With this in mind, we will have approximately **10 problem sets** plus some additional assignments, with both theoretical exercises and computer projects, that will be handled in class and will provide you with extra training for tests. In addition, there will be **two midterms and a final exam**. Last but not the least, you will be required to **read two books** during the semester. These books will provide you with more familiarity regarding the extent to which Statistics can be applied to answer 'real world' questions. As it turns out, the first book review is mandatory but the second will be optional and, as an incentive, you will received extra credit for it. I will provide you with more information about the book reviews in a separate handout.

The weight of each one of these components in the final grade and the important dates will be as follows:

Table 1: Grading Weight

Problem Sets & Quizzes	20%
Book Reviews	10%
Midterm 1	20%
Midterm 2	25%
Final	25%

Table 2: Important Dates (Tentative)

First Day of Class	Wednesday, January 18.
Midterm 1	Monday, February 20.
First Book Review	Monday, March 19.
Midterm 2	Wednesday, April 4.
Second Book Review	Wednesday, April 25.
Last class day	Wednesday, May 2.
Final Exam	Tuesday, May 8 from 8:00AM to 10:00AM.

Extra Credit: Within the first few class lectures, you should begin to notice that applications of the concepts we are studying are abundant in the world around us. I will bring as many "real world" applications to class as possible, and I encourage you to do the sameyour contributions will enhance the class as well as your individual learning experience. As extra incentive, I will add up to 10 points to the lowest problem set grade of students who do the following: find an article from a newspaper, magazine, or Web site that is in some way applicable to what we are learning in the course, send it to me via e-mail, and be prepared to discuss the article (very) informally in class. I will post links to these articles on Concourse so other students can read them before class as well. While there is no deadline for these articles, if you send me an article two weeks before the end of the semester and I already have four articles on the docket, yours will not be included (and you will not receive extra credit). It is therefore in your interest to send me articles sooner rather than later.

Course Outline -Tentative-

1. Introduction. Lectures 1-3 (Chapters 1-3 ASW)

   - Basics of the course.
   - Introduction to statistics.
   - Representation of descriptive statistics.

2. Descriptive Statistics. Lectures 4-7 (Chapter 3 ASW)

   - Measures of location.
   - Measures of dispersion.
   - Measures of association.
   - Measures of distribution shape.

3. Basics of Probability. Lectures 7-9 (Chapter 4 ASW)

   - Working with sets.
   - Counting and assigning probabilities.
   - Conditional probabilities.
   - Bayes' Theorem.

   First Midterm

4. Discrete Probability Distributions. Lectures 9-11 (Chapter 5 ASW, Chapter 3 WMS)

   - Discrete and continuous random variables.
   - Discrete probability distributions.
   - Expected value and variance.
   - Binomial distribution.
   - Poisson distribution.
   - Hypergeometric distribution.

5. Continuous Probability Distributions. Lectures 12-15 (Chapter 6 ASW, Chapter 4 WMS)

   - Uniform distribution.
   - Normal distribution.
   - Standard normal.
   - Exponential distribution.

6. Introduction to Sampling and Sampling Distributions. Lectures 16-18 (Chapter 7 ASW)

   - Selecting sample.
   - Point estimation.
   - Sampling distributions.

   Second Midterm

7. Interval Estimation. Lectures 18-19 (Chapter 8 ASW, Chapter 8 WMS)

   - Population mean.
   - Sample size.
   - Population proportion.

8. Hypothesis Testing. Lectures 19-23 (Chapter 9, 10, and 11 of ASW, Chapter 10 WMS)

   - Null and alternative hypotheses.
   - Type I and type II errors.
   - Population mean.
   - Population proportion.
   - Difference between two population means.
   - Testing Difference between two population proportions.

9. Simple Linear Regression. Lectures 24-25 (Chapter 12 ASW, Chapter 10 WMS)

   - Simple Linear Regression Model.
   - Least Squares.
   - Model Assumptions.

   Final