Econ 307: Principles/Methods of Statistics
Syllabus – Fall 2017

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Class: MWF 12-12:50 in Tyler 133
Office Hours: M 1-2:30, F 9:30-11, and by appointment

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OH location: Morton 241/Swem Library

Course Objectives

In this class, we will learn how to use statistics to answer questions and make inferences about the real world. The statistical methods include data collection, display, interpretation, and analysis. This class will cover descriptive statistics, probability, statistical inference, and regression analysis.

Textbooks

I recommend students to have more than one book for this class. Gary Smith's *Introduction to Statistical Reasoning* offers nice explanations. It is a popular one at William & Mary, but it has been out of print. You should pair this book with another book that is more mathematic-heavy such as one of these free online ones:

- OpenIntro: https://www.openintro.org/stat/textbook.php
- Shaefer & Zhang: https://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=135
- Openstax: https://openstax.org/details/introductory-statistics

Computing/Software

Students are permitted to bring laptops to class. However, laptop usage during class time is reserved only for academic purposes.

Stata and Excel will be the main software for this class. Some homework questions would require these programs. If you are an Economics major or intend to take Econ 308, you are highly encouraged to use Stata. Stata is available on the Public Access Computer (PAC) labs around campus. You can also purchase Stata for 6 months or a year if you plan to take Econ 308. Stata Small is sufficient for this class, but it may not be for your future research.

Assignments and Exams

- **Homework**: Homework, due dates, and solutions will be posted on Blackboard. Students are encouraged to work in groups, but each student must submit her own homework with her own words and mathematical work. The lowest homework score will be dropped.
- **Quizzes**: There will be 3-5 quizzes throughout the semester. The lowest quiz score will be dropped.
    - There will be no make-up quizzes. If you have to miss a quiz, that quiz score will be dropped. If you have to miss more than one quiz, you have to obtain an appropriate documentation in advance AND your quizzes will be reweighted.
- **Exams**: There will be two non-cumulative exams on Oct 11, and Dec 15 (9-12 pm).
    - There will be no make-up exams. If you have to miss any exam, you have to obtain an appropriate documentation in advance AND your exams will be reweighted.
    - If you are eligible for accommodations on exams, you must contact Student Accessibility Services as soon as possible. After you have a proper letter for the semester, it is also your responsibility to set up an exam appointment with them and notify me prior to all exams.

- **Short essays**: You will be asked to write short essays at the end of some unannounced classes. The essays will address your understanding and problems with materials covered in those classes. These essays serve as an incentive for you to attend classes and as a feedback for me.
- **Plickers questions**: I ask questions where students should answer using a Plickers card. Scores and attendance rates from these questions serve as extra credits when your grade is marginal.
  - Students should keep the given card for the whole semester. You should also take a note of your card number. If you lose the card, you are responsible for reprinting the card from https://www.plickers.com/PlickersCards_2up.pdf.
- **Mini group project**: You will apply statistical methods from the class to a question that interests you. We will discuss the project in details as the class proceeds. A topic proposal is due on Nov 3, and the final paper is due on Dec 8.

Policies on Assignment/Exam Submissions and Grading

- **Hard copies**: Every assignment must be submitted in hard copies, unless stated otherwise. For homework assignments, you may give it to me in person, put it in my box in Tyler 312, or slide it under my door. If you do not hand your work to me in person and the work goes missing, you are responsible for getting it to me by the deadline to avoid late penalties.
- **Late submission**:
  - Late homework submission is subject to a penalty of one grade down. No work is accepted after 48 hours of the deadline or after solutions are posted, whichever is sooner.
  - Late projects will not be accepted.
- **Grade questions**: I am happy to discuss questions about grading on assignments and exams. To do so, please submit a request in writing within 1 week of receiving your work back from me. Your request must describe your concern in details.

Grades

The class grade may be curved. The breakdown is as follows:

Homework	12%
Short essays	3%
Project	10%
Exams	30% each
Quizzes	15%

Important Dates

Dates	
Sep 8	Add/drop deadline
Oct 11	First exam
Oct 27	Withdraw deadline
Nov 3	Project proposal deadline
Dec 8	Final project paper deadline
Dec 15	Final exam (9-12)

Topic Schedule

- Introduction
- Descriptive Statistics
- Probability Analysis
- Random Variables, Joint Probability Distributions, Expected Value, Covariance
- Binomial Distribution, Normal Distribution

- Sampling, Sampling Distribution, Confidence Intervals
- Hypothesis Testing
- Two Sample Tests, Chi-Square Tests
- Simple Regression
- Multiple Regression