ECO202: Statistics and Data Analysis for Economics

Lecture: Monday and Wednesday, 11:00am-12:20pm, Robertson Hall 100

Course Description: An introduction to probability and statistical methods for empirical work in economics. Probability, random variables, sampling, descriptive statistics, probability distributions, estimation and hypotheses testing, introduction to the regression model. Economic data sources, economic applications, and the use of statistical software packages will be emphasized.

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Preceptors:
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Office hours of the preceptors will be announced shortly.
There are no precepts in the first week.

Prerequisites: MAT 103 or equivalent

Textbook: “Introduction to the Practice of Statistics” by David Moore and George McCabe, fifth ed (Freeman). (Unfortunately, the exercises will require you to obtain the fifth edition, not the fourth.)

Evaluation:
- Homework (20%)
- Two in-class exams (20% each for a total of 40%)
- Final Exam (40%)
**Homework:**
The homework will consist of approximately one problem set per week, and will be posted on Blackboard. It is assigned on Wednesdays and is due the following Monday in class. If one day you cannot make it to class, the problem set has to be given to the preceptors or put in their mailbox the same Monday at 11:00am at the very latest. Homework handed in later will not be accepted. The relatively worst homework will be dropped and does not count towards your final grade.

You may work on the assignments in groups of up to three students, and submit a single answer sheet. If you choose to work in a group and still submit an individual answer sheet, then you must indicate the names of the other group members. Thinking about the homework problems is essential for understanding the concepts we will cover.

If exceptional circumstances arise which you feel warrant an exception to these rules, then you **must** bring a letter or email from McCosh or your Dean (this is Frank Ordiway for Juniors and Dick Williams for Seniors). The preceptors and I will not consider any exceptions for late homework and the like without such a written statement.

**Exam dates:**
The first exam will be held in class on Wednesday, March 7th and will make up 20% of your grade.
The second exam will be held in class on Wednesday, April 11th and will make up 20% of your grade.
The final exam is comprehensive, makes up 40% of your grade and will be at a time and place determined by the registrar during final exam week.

**Software:**
The preceptors will give an introduction to STATA in the first precept (during the second week of class). STATA is a powerful statistics package. Some basic knowledge will be helpful for you not only in this course, but for any further course in statistics and econometrics, and quite possibly even at your first job.

STATA is available at the McCosh computer clusters, and you can purchase personal copies at a reduced (although still substantial) price of $89 for a one-year license and $145 for a perpetual license. Details are on the course website. Alternatively, you might choose to work with Microsoft Excel.
Tentative Course Outline (MM=McCabe and Moore)

Week 1
- Introduction
- Graphical Display of Data, Descriptive Statistics (MM 1.1)

Week 2
- The Normal Distribution and Standardization (MM 1.2, 1.3)
- Scatterplots, Correlation and Regression (MM 2.1, 2.2, 2.3)

Week 3
- Mathematics of Least-Squares Regression (MM 2.3)
- Correlation vs. Causation (MM 2.4, 2.5)

Week 4
- Data Collection, Sample Designs (MM 3.1, 3.2, 3.3)
- Sampling Distributions, Formalizing Probability I (MM 3.4, 4.1)

Week 5
- Formalizing Probability II (MM 4.2, 4.5)
- First Exam

Week 6
- Random Variables and Expectations (MM 4.3, 4.4)
- The Law of Large Numbers (MM 4.4)

Week 7
- Sampling Distributions for Counts (MM 5.1)
- Sample Means and the Central Limit Theorem (MM 5.2)

Week 8
- Confidence Intervals (MM 6.1)
- Hypothesis Tests (MM 6.2)

Week 9
- Significance Levels and Power of a Test (MM 6.3, 6.4)
- Second Exam

Week 10
- Inference for the Mean (MM 7.1)
- Comparing two Means (MM 7.2)

Week 11
- Inference for Proportions (MM 8.1, 8.2)
- Inference in Simple Linear Regression (MM 10.1)

Week 12
- Introduction to Multiple Regression (MM 11.1)
- Review of Concepts

Final Exam