



DEPARTMENT OF ECONOMICS

SPRING 2023 SYLLABUS

ECON 2843 HONORS STATISTICS
435 Cate Center 1

Prof. Alexander Holmes
325-2861

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OFFICE HOURS: I will be available every Monday and Wednesday 10:30-12:30. If that time is inconvenient, please email and we can set another time.

I will NOT use the Canvas email system for individual communications. I will use your OU email address and system for individual communications and will respond ONLY to my OU email and NOT to canvas emails from you. See my email address above.

CLASS TIMES and PLACE: Monday, Wednesday, MW 3:00-4:15 Room 338 Cate Center One

REQUIRED TEXT: FREE on line open source text Open Stax College, thanks to Rice University, *Introductory Statistics*, Alexander Holmes found at:

[http://openstaxcollege.org/pages/Introductory Business Statistics](http://openstaxcollege.org/pages/Introductory_Business_Statistics)
OR go to my web page at the Economics Department web site under "classes". Go to OU.edu/cas and then to the economics department web site then to Holmes.

OR access Canvas for this course. I suggest that the text be downloaded into your laptop so that it can be accessed during class.

EXAMINATIONS AND GRADED ASSIGNMENTS

There will be two one-hour examinations during regularly scheduled class periods. These will be announced approximately one week in advance. These examinations will each account for approximately 25% of your final grade. You will also write a regression analysis paper that will count for 15% of the grade leaving 35% being determined by a **comprehensive** final examination. The examinations will be problem solving in nature. Past exams with answer key are provided on my website. These are very helpful in getting a grasp of the type of exam questions that will be on the exams. Note please that these questions are not at all like those typically given to a statistics class.

The paper will require you to develop a theory that you will test using regression analysis. First you will be responsible for gathering relevant data and then run the OLS regression you feel tests your theory. And then, of course, write your conclusions. You will receive a detailed written assignment later as we move through the semester. The Regression paper will be due same date of the final exam.

There will be no makeup examinations except for persons securing an official University excused absence through their channels. In any case, no examinations may be made up beyond the final day of regularly scheduled class. It goes without saying that unexcused missed examinations receive a zero grade.

SPECIAL NOTE: Any student who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible to make necessary accommodations.

CLASS PARTICIPATION AND OUT OF CLASS INSTRUCTION

It is hoped that discussion of the topic can be generated in class and thus questions may be cleared up in that way. However, I realize that there are always unanswered (unasked) questions and thus I will be available for more individual help. My standing office hours are listed above. Please feel free to contact me about a mutually convenient time if these do not match your schedule.

COURSE OUTLINE:

The text for this course is an open sourced online FREE text. It is composed of 13 chapters and is augmented by OU On- line videos for each section available through Canvas and/or Mymedia.

We will work our way through the material as follows in Chapters:

- 1-3 Sampling and Data, Descriptive Statistics, Probability theory
- 4 Discrete Probability Density Functions
- 5 Continuous Probability Density Functions
- 6 The Normal Probability Density Function

HOURLY EXAMINATION #1 (Approximately 7th week)

- 7 The Central Limit Theorem AND Law of Large Numbers
- 8 Confidence Intervals
- 9 Hypothesis Testing Theory
- 10-12 Various Tests of Hypothesis

HOURLY EXAMINATION #2 (Approximately 13th week)

- 13 Linear Regression and Correlation

COMPREHENSIVE FINAL EXAMINATION:

4:30-6:30 PM Wednesday May 10, 2023

Regression Project Outline

The goal of the required regression paper is to familiarize you with the statistical software often used in regression analysis, Microsoft Excel, and to sharpen your analytical skills along with the creative act of developing and testing a model. Just what you decide is the relationship you desire to test is not significant, BUT it must stand up to the standard that it makes some sense that your dependent variable is reasonably dependent upon your independent variables. You are required to make such a statement in your paper and are expected to defend it.

Your model is required to have at least 3 independent variables and 30 observations. The data are to be actual data not some hypothetical data you manufacture. You may, however, develop a survey and use those data, but be advised that developing surveys is a whole statistical paper in itself.

This paper will be graded on both its demonstrated analytical skills and writing ability. It is expected that this paper could be completed in less than 6-10 pages. Do not include your data, but you must provide the citation as to its source so we can retrieve it if desired. You may present your results in the format of the Excel output. These results are NOT self-explanatory! You are to tell the reader what you found and what conclusion you draw from your work.

To help, the outline below is provided:

1. Provide a clear TOPIC with rational reasoning for choosing said topic.
 - a. Construct a null and alternative hypotheses for each of your independent variables
 - b. Explain briefly what you are trying to determine/prove
2. DATA collection
 - a. Include a summary of your data in the paper. (Descriptive statistics)
 - b. Provide the source of your data with an appropriate citation.
 - c. Outline expected outcomes before analyzing results.
3. Build a MODEL
 - a. Use regression on Microsoft Excel to build a linear model.
 - b. Explain briefly your interpretation of the slope, the correlation coefficient, and the coefficient of determination as it relates to your data
4. Analyze your results
 - a. Explain your model in detail.
 - b. Run a hypothesis test on the coefficients of each variable.
 - c. Run a hypothesis test on the model as a whole using the F-test method.
 - d. Explain the results from both part b and c above in order to make a final determination about the validity of your model.

Do not be too distressed if your model does not perform as your theory suggested it would. Do

not be surprised that variables you thought would have positive slopes have negative ones and vice-versa. Sometimes it just works out that way.

Remember, this paper is not expected to forge new frontiers in Economics, or accounting or management, or biology or etc. It is an exercise to get practice with a methodology and a powerful statistical tool.

