Econ 3640-001
Probability and Statistical Inference
(Fulfills QB General Education Requirement)

Instructor: Sophie Wu
Location and Time: OSH 277, MW 11:50 am- 1:10 pm
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Office Hours: by appointment

Objectives:
This course fulfills the QB general education requirement. It aims to equip students with a deep understanding of statistic theories and theorems. Therefore, the primary lecture sessions will focus on demonstration and explanation of numerical examples linked to theories behind. Students are expected to have keen mathematical skills to succeed in this course.

The course structure can be divided into three main categories:

1. Descriptive Statistics (Ch 1-4)
2. Probability Theory (Ch 5-8)
3. Estimation and Statistical Inference (Ch 9-13)

At the end of this semester, students will be able to demonstrate qualitative literacy and problem solving abilities, and use the statistical skills that they learnt from this course to apply to their economic research work.

Qualitative Literacy:

(1) Interpretation: ECON 3640 teaches how to interpret different types of graphs (for example, pie chart, bar graph, histograms), numerical summaries of data (for example, proportion, mean, median, variance, standard deviation), statistical test results (for example, hypothesis tests about means, proportions).

(2) Representation: ECON 3640 teaches how to construct appropriate graphical and numerical summaries of data, how to present estimates and test results.

(3) Estimation: ECON 3640 teaches the theoretical foundations of statistical estimation and how to use a sample to construct the estimates.

(4) Application: ECON 3640 teaches how to distinguish between different types of variables, so that they can use appropriate summaries and estimates for analysis. ECON 3640 also teaches the strengths and limitations of the estimations, so that they can apply them judiciously.

(5) Communication: ECON 3640 teaches how to present statistical results in simple language so that it can be communicated to a general audience.

Problem Solving:

(1) Defining Problems: The assignments and project in ECON 3640 teaches how to systematically define a problem for statistical analysis. The students are required to state the objective of an analysis in very precise terms (example, gender based comparison of academic

performance of ECON majors). They are also required to identify the following before embarking on the analytical process: the unit of analysis (for example it can be individual, firm, country), the attributes of the units that need to be analyzed, and the nature of attributes (quantitative or categorical).

(2) Identifying Strategies: ECON 3640 teaches students to identify appropriate graphical and numerical analytical strategies based on the problem description and the nature of the variables.

(3) Generating Solutions: ECON 3640 teaches students to appreciate that there exist several ways of addressing a question. For example, for a hypothesis testing one can construct different alternative hypotheses and the result can depend upon the way the hypothesis is stated.

(4) Selecting Solutions: ECON 3640 teaches students to select the solution approach that best suits their problem description.

(5) Evaluating Outcomes: ECON 3640 emphasizes the need to interpret the statistical results in the broader context that requires synthesis of reasoning from varied perspectives.

Textbook:
Statistics for Management and Economics (January 2014), 10th edition
ISBN10: 1-285-42545-6
ISBN13: 978-1-285-42545-0

Grade Weights:
Four midterms: 60%
Final exam: 30%
Assignments: 10%

Tentative Grade Scales:
A: 92 or above
A-: 85 or above
B+: 80 or above
B: 75 or above
B-: 70 or above
C+: 65 or above
C: 60 or above
C-: 50 or above
E: fail directly

Tentative Schedules:
This schedule is tentative and may be changed according to the flow of the lecture. Please follow the announcement on canvus for the most updated exam or assignment submission dates. (*: You need to submit your assignments on these dates.)

01/12: introduction
01/14: ch 1-4
01/19: No class, Martin Luther King Day
*01/21: ch 1-4

01/26: ch 1-4
*01/28: ch 1-4
02/02: ch 5-6
02/04: midterm 1
02/09: ch 5-6
*02/11: ch 5-6
02/16: No class, Presidents' Day
*02/18: ch 5-6
02/23: midterm 2
02/25: ch 7
03/02: ch 7
*03/04: ch 7
03/09: ch 7
*03/11: ch 8
03/16: No class, Spring break
03/18: No class, Spring break
03/23: midterm 3
03/25: ch 8-10
03/30: ch 8-10
*04/01: ch 8-10
04/06: ch 8-10
*04/08: ch 8-10
04/13: midterm 4
04/15: ch 11-13
*04/20: ch 11-13
04/22: ch 11-13
*04/27: last class

Final Exam: May 4th, 10:30 am -12:30 pm (Monday)

Rules: 1. Students must take the exams on the scheduled dates.
2. Cheating and plagiarism will result a failure mark in this class.
3. Late homework submission will not be tolerated.

The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.