Syllabus| Econ 3640- 003 Probability and Statistical Inference
(Fulfills QB General Education Requirement)

Class time: Wednesday, 6:00 pm – 9:00 pm
Classroom: OSH 111
Instructor: Sophie Wu
Email: sophiewu.pro@gmail.com

Consultation/ Office Hours
      Statistics may not be an easy class for most of people. Therefore, you are encouraged to send me an email anytime when you need help for consultation.

Objective
      This course fulfills the QB general education requirement. It aims to equip economics students with adequate tools to perform data analysis using Microsoft Excel or LibreOffice Excel most commen commands and formulas. The numerical examples demonstrated in the lecture intend to give students a keen sense regarding how statistical tools are applied in handling real business problems.

      The course structure primarily covers three main topics in statistics:
(1) descriptive statistics;
(2) discrete and continuous probability distributions and their applications;
(3) statistical inference based on the knowledge of probability distribution.

      At the end of the course, students will be able to demonstrate quantitative literacy and problem solving abilities, as the foundations for lifelong learning.

Quantitative 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.

<u>Foundation and Skills for Lifelong Learning</u>:

ECON 3640 promotes "Foundations and skills for lifelong learning". The applied project engages students' curiosity and motivation by providing an opportunity for students to explore a topic of their own choice. The project as well as the home assignments and in-class discussions promote independence of thought, transfer of skills, and reflection for interpreting statistical information in varied contexts and from varied perspective.

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

Grade Weights
in-class exams: 40%
assignments: 30%
final exam: 30%

Tentative Grade Scale:
A: 90 or above   A-: 85 or above   B+: 80 or above   B: 75 or above
B-: 70 or above   C+: 60 or above   C: 55 or above   C-: 50 or above
E: < 50

The final letter grade will be curved based on students' relative standing compared to the whole class. The grade scale therefore may be changed or adjusted.

Tentative Schedules
This schedule is <u>tentative</u> and <u>may be changed</u> according to the flow of the lecture. Please follow the class announcement for the exam and assignment submission dates.

1/08   statistics overview: ch 1, 2

1/15   graphical and numerical descriptive statistics: ch 3, 4

1/22   graphical and numerical descriptive statistics: ch 3, 4

1/29   * in-class exam 1 (ch 1-4)
             * assignment 1 submission
             sampling ch 5, ch 8.2 normal distribution

2/05   ch 8.2 normal distribution
                probability ch 6

2/12   probability: ch 6

2/19   * in-class exam 2 (ch 5, 6, 8.2)
                * assignment 2 submission
                discrete probability distribution: ch 7

2/26   discrete probability distribution: ch 7

3/05   *in-class exam 3 (ch 7)
                *assignment 3 submission

3/12   spring break, no class

3/19   continuous probability distributions ch 8

3/26   * assignment 4 submission
                sampling distributions ch 9

4/02   estimation: ch 10

4/09   hypothesis testing: ch 11

4/16   *in-class exam 5 (ch 9, 10)
                statistical inference: ch 11, 12

4/23   * assignment 5 submission
                 statistical inference: ch 12, 13

4/30   final exam 6:00 pm- 8:00 pm

Policy and Rule
1. In-class exam and assignment due dates will be announced in class. Students are responsible for attending the class regularly and paying attention to the class announcement regarding the exam and assignment submission dates.
2. Failing to take the exams on the scheduled dates may result in an unsatisfactory or failing final letter grade. Students who fail to take the exams on the scheduled dates will be given zero mark directly unless an unpredictable event happens to prevent this from happening.
3. Late submissions are not accepted and will be given zero mark directly.
4. Plagiarism and any forms of cheating are not tolerated. Penalties may include failure of an assignment, the entire course, and/or the filing of formal charges with appropriate university authorities.

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.