ECON 3640: Probability and Statistical Inference

Spring Semester 2020

TTh, 12:25PM-1:45PM; GC 2675

Instructor: Kelsey Carlston

Email: kelsey.carlston@utah.edu

Office Hours: By Appointment

Office Location: Economics Department Common Area (Ask front desk)

Prerequisites

College Algebra, ECON 2010 and ECON 2020

This course is intended for students who either want to understand fundamental probability and statistics, or who intend to advance to more difficult levels of math and econometrics.

Required Materials

There are no required materials for this course. I will post notes with all relevant lecture material. If you want further information, here is a useful reference:

- Gerard Keller, *Statistics for Management and Economics*, 10th edition, South-Western/Cengage, 2014.

Course Description

This course is a 3-credit hour class offered by the Economics Department which is primarily designed to help undergraduate students in understanding the basic foundations of statistics. At first, we will study the fundamental concepts of descriptive statistics. Secondly, the focus is on probability theory and its

connections with discrete and continuous distributions (e.g., Binomial, Poisson, Uniform, Normal, Chi-squared and F). Thirdly, our aim is to analyze statistical inference with respect to different parameters, such as population means, variances, and confidence intervals by means of estimation techniques.

Course Outcomes

By the end of this course, you will:

- be able toapply deductive reasoning, inductive reasoning, and set theory to unknown situations
- know several distributions, including the normal, Bernoulli, geometric, binomial, Poisson, uniform, and exponential distributions, and how to apply them
- be able to compute and interpret the mean, standard deviation, and confidence intervals of different kinds of variables
- be able to create and interpret descriptive statistics and graphs to analyze a dataset
- be able to construct and interpret linear regression models

Teaching and Learning Methods

This class will use lecture, in-class activities, out of class assignments, and a final research project to teach students the basics of probability theory and how to use basic statistics to answer research questions. I believe the best method of learning is by doing, so I will incorporate into lectures activities to solidify and apply ideas.

University Policies

1. The Americans with Disabilities Act. 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 this class, reasonable prior notice needs to be given to the Center for Disability & Access, 162 Olpin Union Building, (801) 581-5020. CDA will work with you and the instructor to make arrangements for accommodations. All written information in this course can be made available in an alternative format with prior notification to the Center for Disability & Access.

2. Addressing Sexual Misconduct. Title IX makes it clear that violence and harassment based on sex and gender (which Includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

3. Academic Code of Conduct. *This course will adhere to the Code of Student Rights and Responsibilities as applicable.*
https://regulations.utah.edu/academics/6-400.php

Course Policies

1. ***Attendance & Punctuality***. Attendance is expected of students, but not required. Attendance will not be taken, but students can earn points through in-class assignments.
2. ***Participation***. This class will be an interactive course that involves answering questions on the white board. Students are expected to participate when called on, though I will never expect a student to know something when they approach the white board – any answers will be guided as necessary.

3. Electronic Devices in Class. Electronic devices are allowed, but if you plan to use your computer or phone, please do not sit in the front 2 rows in order to avoid distracting other students.

Grading Policy (Evaluation Methods & Criteria)

Students can earn up to 100 points using any combination of the following:

5 Homework Assignments – 5 points each

2 Exams – 20 points each

In Class Assignments – participation based, 20 points total

Final Research Project - 30 points

Homework assignments will be based on class materials and lectures. Students may work alone or within a group. Assignments are expected to be turned in via Canvas. Late assignments will receive a 50% penalty.

The two exams will not be cumulative. The first exam will cover descriptive statistics, probability theory and distributions, and the second will cover statistical inference and regressions.

In class assignments are based on participation and must be done in class. They will relate to current lecture material.

Details about the final research project will be given later in the semester.

In order to get full points for the class, the student may do any or all of the assignments and exams.

Note: This syllabus is meant to serve as an outline and guide for our course. Please note that I may modify it with reasonable notice to you. I may also modify the Course Schedule to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas under Announcements.

Course Summary:

Date	Details		
Tue Jan 28, 2020	Assignment	Assignment 1	
Tue Feb 18, 2020	Assignment	Assignment 2	
Wed Feb 26, 2020	Assignment	Attendance 1/6 to 2/25	c
Tue Mar 3, 2020	Assignment	Assignment 3	
Tue Mar 17, 2020	Assignment	Assignment 4	

Date	Details		
Thu Mar 19, 2020	Assignment	Exam 1	d
Tue Apr 14, 2020	Assignment	Assignment 5	
Tue Apr 21, 2020	Assignment	Final Project	d
Wed Apr 22, 2020	Assignment	Exam 2	d
	Assignment	Attendance 2/27 to 4/21	d