Course Syllabus
University of Colorado, Boulder
Introduction to Statistics with Computer Application
Economics 3818-050
Spring 2020

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Office: Econ 14
Office Hours: M 3-4 p.m.; W 4-5 p.m.

Classroom: Econ 119
Class Meeting Time: T/TH 9:30-10:45 a.m.

Recitation Classroom: Econ 119
Meeting Times: Section 051 M 4-4:50 p.m.; Section 052 W 3-3:50 p.m.

Textbook
The Basic Practice of Statistics, 8th Edition, by David Moore, William Motz, and
Michael Fligner. The course uses the Sapling Learning system provided by the publisher,
Macmillan Learning. There is a $90.90 charge for this service and it comes with free
access to an online version of the book. You must sign up and use Sapling. You can rent
or buy the book from the publisher, MacMillan Learning, or Amazon.

Class Technology
Sapling Learning System
The course will use the Sapling Learning system for homework and some quizzes.
There are instructions to sign up for Sapling on the course Canvas site. You must
use this system for homework.
Clickers - The class and recitation sections will use clickers and therefore you will need
to bring your clicker to every class and section, beginning with the first day of class.
Answers to clickers questions will be used for class attendance and will be part of your
grade.
Hand Held Calculator – You will need a calculator to do calculations in class,
particularly during exams. You cannot use your phone or borrow your neighbor's
calculator during exams. Graphing calculators that have built-in statistical functions are
recommended, e.g. TI-83 or TI-84. You will need to be versed in using these calculators
for exams.

R Computer Applications –R is a free programming language that is available for Mac, Windows, and Unix operating systems. It is pre-installed on computers in most University computer labs and can be downloaded from the Internet. You will use the R Studio Interface to do R exercises. We will spend some of our class/recitation time working on these. R has good self-contained documentation in the basic R installation. On your first R exercise you will get some basic training on how to install and do some basic operations in R. I will help you through the semester. An additional free resource is the book Modern R with the tidyverse by Bruno Rodgrigues:

https://b-rodrigues.github.io/modern_R/

This free ebook provides instruction on programming in R. But mainly we are going to implement the things we learn from the book in R.

Class Support/Help
(1) The primary help options for the course are the professor and teaching assistant who have regular office hours.

(2) The department offers a free drop-in tutoring lab. Information can be found by clicking here.

(3) There are private tutors that provide one-on-one help for a fee. The department keeps a list of potential tutors that can be found by clicking here.

Do not fall behind in this course. Students who keep up with all assignments tend to succeed in the course. Failing to keep up often results in failing the course. Do the required work and use the help available to you to in order to master the material. I want you to succeed in the course.

Course Overview
The purpose of this course is to introduce you to the principles of statistical reasoning and inference. To this end the ultimate goals of the course are for you to thoroughly understand the following concepts: sampling distributions, hypothesis testing, and confidence intervals across multiple settings covered in the course. This foundational course is essential to your success in the study and long-run understanding of economics. CU economics 4000-level courses require knowledge of basic statistical reasoning and understanding. Further our required econometrics courses build directly off of this course. Finally, this course helps you build a skill that has enormous potential financial return in the marketplace.

The course consists of five closely related parts. The first part of the course introduces ways to explore data using visual and numerical measures. The second part of the course introduces you to basic probability theory, popular probability distributions, and mathematical expectation. The third part of the course introduces you to sampling distributions and their properties, properties of estimators, confidence intervals, and hypothesis testing. The fourth part of the course is all applied statistical inference

including inference about the mean of a probability distribution, inference about differences in two population means, inference about a single proportion from a population, and inference about differences in two proportions. The fifth and final part of the course explores correlation, simple regression analysis, and inference about simple regression.

Course Topics (in order)
Introduction to R
Chapter 1 Picturing Distributions with Graphs
Chapter 2 Describing Distributions with Numbers
Chapter 12 Introducing Probability
Chapter 13 General Rules of Probability
Supplemental Probability Problems
Chapter 14 Binomial Distributions
Chapter 3 The Normal Distributions
Midterm 1 About Here
Mathematical Expectation & Other Distributions
Chapter 8 Sampling
Chapter 9 Experiments
Chapter 10 Data Ethics
Chapter 15 Sampling Distributions
Properties of Estimators, Central Limit Theorem, Law of Large Numbers
Chapter 16 Confidence Intervals: The Basics
Chapter 17 Tests of Significance: The Basics
Chapter 18 Inference in Practice
Midterm 2 About Here
Chapter 20 Inference about a Population Mean
Chapter 21 Inference Comparing Two Means
Chapter 22 Inference about a Population Proportion
Chapter 23 Inference Comparing Two Proportions
Chapter 24 Inference about Variables: Part IV Review
Chapter 4 Scatterplots and Correlation
Chapter 5 Regression
Chapter 26 Inference for Regression
Chapter 6 Two-Way Tables

Prerequisites: Econ 2010 and Econ 2020 and either Econ 1088 or Math 1081 or Math 1300 or Math 1310 or APPM 1350 (all minimum grade C-). Restricted to students with 22-180 units completed.

Course Evaluation

Homework   10%
R Exercises   10%
Recitation   10%
In-class Clicker   5%
Midterm 1   20%
Midterm 2   20%
Final   25%

Important Dates

January 14 – First Day of Class
February 13 – Midterm 1
March 19 – Midterm 2
March 23-27 – Spring Break
April 30 – Last Day of Class
May 5 – Final Exam, Econ 119, 4:30-7 p.m.

Course Policies

Attendance

Daily attendance will be taken for each class. You must attend a minimum of 80% of the lectures in order to pass the course and separately the recitation. **If you miss more than 20% of the lectures, more than 6 absences, you will receive an automatic F in the course.** Attendance will be recorded through a daily sign-in sheet.

ACCOMMODATION FOR DISABILITIES

IF YOU QUALIFY FOR ACCOMMODATIONS BECAUSE OF A DISABILITY, PLEASE SUBMIT YOUR ACCOMMODATION LETTER FROM DISABILITY SERVICES TO YOUR FACULTY MEMBER IN A TIMELY MANNER SO THAT YOUR NEEDS CAN BE ADDRESSED. DISABILITY SERVICES DETERMINES ACCOMMODATIONS BASED ON DOCUMENTED DISABILITIES IN THE ACADEMIC ENVIRONMENT. INFORMATION ON REQUESTING ACCOMMODATIONS IS LOCATED ON THE DISABILITY SERVICES WEBSITE (WWW.COLORADO.EDU/DISABILITYSERVICES/STUDENTS). CONTACT DISABILITY SERVICES AT 303-492-8671 OR DSINFO@COLORADO.EDU FOR FURTHER ASSISTANCE. IF YOU HAVE A TEMPORARY MEDICAL CONDITION OR INJURY, SEE TEMPORARY MEDICAL CONDITIONS UNDER THE STUDENTS TAB ON THE DISABILITY SERVICES WEBSITE AND DISCUSS YOUR NEEDS WITH YOUR PROFESSOR.

RELIGIOUS HOLIDAYS

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class please inform me in advance and when a religious observance will keep you from attending class or missing an assignment.
See the campus policy regarding religious observances for full details.

PREFERRED NAMES AND PRONOUNS

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

CLASSROOM BEHAVIOR

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on classroom behavior and the Student Code of Conduct.

SEXUAL MISCONDUCT, DISCRIMINATION, HARASSMENT AND/OR RELATED RETALIATION

The University of Colorado Boulder (CU Boulder) is committed to fostering a positive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, intimate partner abuse (including dating or domestic violence), stalking, or protected-class discrimination or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or cureport@colorado.edu. Information about the OIEC, university policies, anonymous reporting, and the campus resources can be found on the OIEC website.

HONOR CODE

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the academic integrity policy. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at the Honor Code Office website.