Course Syllabus
University of Colorado Boulder
Introduction to Statistics with Computer Application
Economics 3818-030
Spring 2019

Professor: Nicholas E. Flores
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Email: Nicholas.Flores@Colorado.edu
Office Hours: T 2-3 p.m., TH 11 a.m. -12 p.m. and by appointment

Classroom: Econ 119
Class Meeting Times: T TH 9:30 a.m. – 10:45 a.m.

Teaching Assistant: Kas McLean
Recitation Meeting Times & Rooms:
3818-031, T 3:30-4:20 p.m., Ketchum 1B84
3818-032, TH 5:00-5:50 p.m., Claire 212

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. The book, in bound and loose-leaf version, is also available at the bookstore if you want a hard copy.

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 and select quizzes.
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. Every other

week or so we will spend time in class to work on R exercises using the R Studio Interface. There will be a brief introduction in class on Thursday January 17, but otherwise you are responsible for learning the language syntax required for the R program exercises. R has good self-contained documentation in the basic R installation. A good additional free resource is the book Modern R with the tidyverse by Bruno Rodgrigues:

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

Class Support

There are multiple ways you can get help with the course. The teaching assistant and professor have regular office hours. In addition, the economics department provides free tutoring. Information about the economics free tutoring lab can be found at
https://www.colorado.edu/Economics/undergraduate/tutorial-lab.pdf

Finally, 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 at
https://www.colorado.edu/economics/sites/default/files/attached-files/tutor_list_0.pdf

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 methods. 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)
Chapter 1 Picturing Distributions with Graphs
Chapter 2 Describing Distributions with Numbers
Introduction to R
Chapter 12 Introducing Probability
Chapter 13 General Rules of Probability
Supplemental Probability Problems
Chapter 14 Binomial Distributions
Chapter 3 The Normal Distributions
Midterm 1
Mathematical Expectation & Other Distributions
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
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.

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

Important Dates

January 15 – First Day of Class
February 12 – Midterm 1
March 21 – Midterm 2
March 25-29 – Spring Break
May 2 – Last Day of Class
May 8, 4:30 – 7 p.m. – Final Exam in Econ 119

Attendance Policy

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, you will receive an automatic F in the course.** Attendance will be recorded through clicker responses in class.

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.

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 maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU's Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic

violence), stalking or related retaliation. CU Boulder's Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at 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.