ECONOMICS 3818-040
Introduction to Statistics with Computer Applications
Fall 2018
TuTh, 2:00-3:15pm, ECON 117

Instructor: Matthew Ridge Butner
      Office: Econ 307
      Office Hours: Wednesday 2:00 - 4:00pm and by appointment
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"Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write."
-Samuel S. Wilks (1950) misquoting H.G. Wells (1903)

Course Description
      Statistical literacy is one of the most valuable skills you can learn at University. This course will give you the theoretical foundation to study and understand statistics with the ultimate goal to prepare you for econometrics. We will start talking about types of data, probability rules and distributions, and sampling methods before midterm one. Midterm two will focus on inference from a sample including sampling distributions, estimation, confidence intervals and hypothesis testing. Before the cumulative final we will briefly discuss the basics of regression analysis.

Course Website:
      Lecture slides, practice exam material, supplemental notes, and R exercises will be posted on the Desire to Learn course page. Data for computer applications will be hosted on my personal webpage. Homework will be completed through Sapling Learning.

Prerequisites:
      Econ 2010 & 2020 & (Econ 1088 or Math 1081 or Math 1300 or Math 1310 or Appm 1350)
      This course will use algebra (summation notation) and calculus (a few integrals)

Textbook:
      The Basic Practice of Statistics, Eighth Edition, by Moore, Notz, and Fligner.
      Macmillian Learning, ISBN-10: 1-319-04257-0

Other Resources:
      Take advantage of office hours held by the TA and instructor. Online resources are plentiful. The economics department has a public tutoring lab where graduate students will help for free. The hours are available here: http://www.colorado.edu/Economics/undergraduate/tutorial-lab.pdf. Additionally, the economic department provides a list of graduate students available for private tutoring at various rates: http://www.colorado.edu/Economics/undergraduate/tutor_list.pdf. Be aware there is no quality guarantee.

Computer Application:
      R is a free programming language available on mac, windows, and unix operating systems. It is pre-installed in most University computer labs and downloadable from the internet. Every other week or so we will spend time in class to work on R exercises through the R studio interface. We will do a brief introduction in class Thursday August 30th, but you are responsible for knowing the language syntax otherwise. Thankfully R has fantastic documentation in the base installation.

Course Components:
Your grade will be determined through four measures with the following weights:
        Exams: 70%   Sapling Homework: 10%   R exercises: 10%   Recitation: 10%

Exams: Two midterms (20% each) and a cumulative final (30%). They will be predominately multiple choice with a few free response questions. If necessary, a curve will be applied on each exam. You are allowed a 3 by 5 index card of hand written notes for reference during the exam.

Sapling Homework: There will be a brief problem set assignment every week. It will be due on Sunday at 6pm. You are responsible for knowing when homework is due. Late homework will not be accepted. Your lowest homework grade will be dropped. **Sapling is required.** Use `butner` as the enrollment key.

R exercises: There will be five simple assignments for you to complete in R and one data project. We will work on each on in class the week before the assignment is due. The data project will give you hands on experience cultivating and analyzing a data set of your choice. The first exercise will not be graded. The remaining 4 exercises and data project are each 2% of your final grade.

Recitation: This is a four credit course. Recitation attendance is mandatory. Your TA is responsible for

Communication:
   My colorado.edu email address is the best way to contact me. I will announce important dates, and course updates, through email. Be sure to check your email to stay up to date in the course.

Tentative timeline
Subject to change at the instructor's discretion.
All chapter numbers refer to Moore et. al. eighth edition.

Week 1 – 8/28	Chapters 1, 2. Population v. sample, introduction to R.
Week 2 – 9/4	Chapters 12, 13.
Week 3 – 9/11	Chapters 14, 3.
Week 4 – 9/18	Mathematical expectation, Chapters 8 and 9.
Week 5 – 9/25	**Midterm 1**, Chapter 15.
Week 6 – 10/2	Properties of Estimators. Chapter 15.
Week 7 – 10/9	Chapters 16, 17.
Week 8 – 10/16	Chapters 17, 18.
Week 9 – 10/23	Chapter 20.
Week 10 – 10/30	Chapter 21, **Midterm 2.**
Week 11 – 11/6	Chapters 22, 23, 4.
Week 12 – 11/13	Chapter 5.
Week N/A – 11/20	**Fall Break**
Week 13 – 11/27	Chapters 6, 25.
Week 14 – 12/4	Chapter 26.
Week 15 – 12/11	Chapters 27, 29.
Final – 12/17	Monday, 4:30-7:00pm, tentative

Important dates:
Homework is due most Sundays!
Clicker questions every class period!
These dates are tentative!

> 8/28 – First day of class
> 9/4 – <u>R exercise 1 due</u>
> 9/5 – Last day to add a class though myCUinfo
> 9/12 – Last to drop a class without Tuition/Fee Charges and without a W Grade
> 9/18 – <u>R exercise 2 due</u>
> 9/25 – <u>Midterm 1</u>, tentative
> 10/16 – <u>R exercise 3 due</u>, tentative
> 11/1 – <u>Midterm 2</u>, tentative
> 11/2 – Last day to drop a class in myCUinfo
> 11/8 – <u>R exercise 4 due</u>, tentative
> 11/19 – Fall Break begin
> 11/23 – Spring Break begin
> 11/29 – <u>R data project due</u>, tentative
> 12/11 – <u>R exercise 5 due</u>, tentative
> 12/17 – <u>Final exam</u>, Monday, 4:30-7:00<u>pm</u>, tentative