ECONOMICS 3818-010
Introduction to Statistics with Computer Applications
Spring 2017
MWF, 11:00-11:50am, CLRE 207

Instructor: Matthew Ridge Butner
Office: Econ 307
Office Hours: Monday 1pm to 2pm and Wednesdays from 9am to 10am in Econ 307
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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. The course has three components, roughly one for each midterm, (1) calculating probability of events and probability distributions (2) properties of random variables including sample statistics and (3) inference from confidence intervals and hypothesis testing. Before the cumulative final, we will briefly discuss the basics of regression analysis. During the semester we will do applications with the programming language R.

Course Website:

Lecture slides and homework assignments will be posted on the Desire to Learn course page.
Data for computer applications will be hosted on my personal webpage.

Prerequisites:

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

Textbook:

Statistics for Economics: An Intuitive Approach, by Alan Caniglia.
This text is out of print, but available at the campus book store and some used book retailers.

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 on most University computer labs and downloadable from the internet. I suggest using Rstudio as an interface, here: https://www.rstudio.com/products/rstudio/download/.
- This program will be used in class, when appropriate, and on a few homework assignments. We will do a brief introduction in class Monday January 23rd, but you are responsible for knowing the language syntax otherwise.

Other Technology:

- Feel free to use your laptop or tablet during lecture for course related activities (notetaking, calculations). If is obvious if you are using the resource for some other purpose. If suspect, you will be asked to leave. No questions asked.
- You will not be allowed to use R during an exam. It is suggested you obtain and familiarize yourself with a basic calculator. Statistical calculators are allowed.
- iClickers will be used in the course. They are not necessary for an A, but can improve you grade.
- You must register you iclicker to receive credit. The following is a tutorial: http://www.colorado.edu/oit/tutorial/cuclickers-iclicker-remote-registration

Course Components:
Your grade will be determined through three measures with the following weights:

Exams: 80% Homework: 10% Recitation: 10%

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

Homework: There will be a brief homework assignment every week, usually due on Friday. You are responsible for knowing when homework is due. On due dates, any homework not turned in at or before the beginning of class will not be accepted. Homework will be uploaded to D2L at least five days before it is due. Your answers must be clearly marked or you will lose points, no exceptions.

Recitation: This is a four credit course. Recitation attendance is mandatory. Your TA is responsible for your recitation grade. The TA for recitation is PhD student **Kassandra McLean** (as of January 16th). There is no recitation the first week of the semester. Recitation times and meeting locations are as below. Make sure you attend the correct recitation. Kassandra will announce her office hours.

Section	Day of week	Time	Room
011	M	2:00—2:50	DUAN G2B60
012	M	4:00—4:50	EDUC 136
013	W	3:00—3:50	CLRE 302
014	W	5:00—5 :50	HUMN 335

Extra Credit: The **only** extra credit opportunity is through iClicker questions during lecture. A maximum of five points will be added to your grade for excellent clicker participation. You must register you iclicker to receive credit. Again, http://www.colorado.edu/oit/tutorial/cuclickers-iclicker-remote-registration

Policies:
There will be **no make-up examinations** unless appropriate documentation is provided.
There will be **no late homework** accepted under any condition.
If you miss class on 1/18, 1/20, or 1/23, **you can be dropped**.
If I can help you with an accommodation, please let me know two weeks before the examination.
This course adheres to all campus policies regarding disabilities, religious observances, appropriate behavior, discrimination and harassment, and academic conduct. See http://www.colorado.edu/policies/

Tentative timeline, subject to change at the instructor's discretion

Week 1 – 1/17	No class, Intro, Descriptive Statistics, Population v. Sample
Week 2 – 1/23	Rstudio, Basic Probability, probability of multiple events
Week 3 – 1/30	Conditional probability, Bayes Law and Discrete Random Variables

Week 4 – 2/6	Review, **Exam 1**
Week 5 – 2/13	Continuous Random Variable distributions, normal distribution
Week 6 – 2/20	Expectation, Joint Random Variable distribution, correlation covariance.
Week 7 – 2/27	Sample properties, Large Sample Theory
Week 8 – 3/6	Review, **Exam 2**
Week 9 – 3/13	Sample statistics, desirable properties of estimators
Week 10 – 3/20	Properties of large sample estimators, Margin of Error
Week N/A – 3/27	**Spring Break**
Week 11 – 4/3	Confidence Intervals, Simple Hypothesis
Week 12 – 4/10	Hypothesis Testing, prob-values, types of errors
Week 13 – 4/17	Review, **Exam 3**
Week 14 – 4/24	More hypothesis testing, Regression Intuition
Week 15 – 5/1	Regression assumptions and application, Review
Final – 5/7	Sunday, 7:30-10:00pm, tentative

Important dates:

Homework is due most Fridays!
Clicker questions each class period!

1/16 – No Class, Martin Luther King Jr. Holiday
2/1 – Last day to drop without tuition charge and without W
2/3 – Last day to change pass/fail
2/10 – Exam 1, tentative
3/10 – Exam 2, tentative
3/24 – Last day to drop the course
3/27 – Spring Break begin
3/31 – Spring Break begin
4/21 – Exam 3, tentative 4/29
5/7 – Final exam, Sunday, 7:30-10:00pm, tentative