STAT/CS&SS/SOC 221: Statistical Concepts and Methods for Social Sciences

Spring 2015

Instructor: **Patricia Martinkova**
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            Office hours: Mondays 1:00 – 3:00 PM and by appointment, CMU B023

Teaching Assistants (name, sections, e-mail, office hours):

Eric Kernfeld **(AA/AB)**	Lanu Kim **(AC/AD)**	Andrew McDavid **(AE/AF)**
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Wed 10:30 AM – 12:30 PM	Tue 2:00 PM – 4:00 PM	Th 10:30 AM – 12:30 PM

Contact: For simple questions, e-mail is the best way to reach us. We will respond to your messages within 72 hours. For more involved questions or discussions, please use office hours.

Meeting Times and Locations:

Lectures: Mo, We, Fri 9:30 AM – 10:20 AM, Savery Hall 260

Quiz Sections: AA: TTh 8:30 AM – 9:20 AM, THO 202
                     AB: TTh 9:30 AM – 10:20 AM, THO 202
                     AC: TTh 8:30 AM – 9:20 AM, THO 211
                     AD: TTh 9:30 AM – 10:20 AM, THO 325
                     AE: TTh 8:30 AM – 9:20 AM, THO 235
                     AF: TTh 9:30 AM – 10:20 AM, THO 134
         Some Thursday quiz sections will take place in CSSSCR labs (117, 121), dates and times will be announced – see also tentative course schedule.

Office Hours: All office hours will be held in the Statistics Tutor & Study Center, CMU B023.

Required Materials:
- **Text:** Moore, D.S. 2009. *The Basic Practice of Statistics. 5th edition.* New York: W. H. Freeman. You will not need access to the online resources that come with the book.
- **Calculator:** You will need a calculator that can add, substract, multiply, divide, and take square roots. Bring the calculator to the class every day. During quizzes you won't be allowed to use device that communicates with other devices as your calculator.
- **Polling device:** This course uses Top Hat classroom polls to assess and provide feedback on understanding of various concepts. You will need a laptop, smartphone, or tablet with wireless internet capabilities to participate in classroom polls. Bring this device to class every day. E-mail me in advance of the beginning of the course if you don't have such a device to make alternative arrangements.

Course webpage: https://canvas.uw.edu/courses/964018
The webpage includes updates to the syllabus, lecture slides, lab materials, assignments, announcements, and other course related materials. You will also use the site to submit your assignments. **Update your communication preferences to be notified of announcements.**

Prerequisites:
There are no prerequisites for this course. This is not a mathematical course, but you will be expected to be capable of doing arithmetic.

Course description and Course Goals:
This course is an introduction to statistical concepts and methods used by social scientists. The overall objective is to provide you with the ability to use statistical tools to critically evaluate data and to be analytical consumers of information in the mass media. The course covers graphical and numerical summaries of continuous and categorical data, correlation and regression, estimation, confidence intervals and significance tests. It emphasizes social science examples and cases.

By the end of this course, you should be able to:
- Define real world questions and problems in statistical terms
- Recognize the importance of data collection, identify limitations in data collection methods and determine how they affect the scope of inference
- Organize data and summarize them numerically and visually
- Apply estimation and testing methods to analyze single variables or relationship between two variables
- Interpret the meanings of statistical solutions in relation to real world issues

Computing:
We will be using statistical environment R and its interface R Studio for demonstration and for computing. R is a free and very powerful statistical environment. You will be able to access R Studio at http://rstudio.stat.washington.edu/ and on computers in lab. For your own convenience, you can also download R at http://cran.r-project.org and R Studio at http://www.rstudio.com/products/rstudio/

Grading Policy:
Final grades will be based on participation (10%), homework assignments (30%), bi-weekly quizzes (35%) and final project (25%).
- **Participation (10%):** Active participation is an important feature of the learning process and is thus given a weight in your course grade. We will use online Top Hat classroom polls to gauge your understanding of basic concepts and to get your responses to questions asked in class. Besides polls, I will sometimes ask you to work in groups. To account for circumstances, two lowest participation grades are dropped. The overall

participation grade is the average of participation grades in each class after dropping the two lowest grades.

- **Homework (30%):** There will be about 9 homework packages and 3 lab assignments that will be posted on course webpage. All assignments are to be turned in via the course website. Due dates and times will be posted on course webpage. Peer-review might be part of your homework assignment.
  Homework late policy: Late homework assignments will be accepted up to 2 days after the due date, and 20% will be deducted from your assignment grade for each day it is late. Homework that is more than 2 days late will not be accepted.
- **Bi-weekly quiz (35%):** To monitor student progress, there will be five closed-book quizzes taking place every second Thursday during quiz section. Your lowest quiz score will be dropped at the end of the term. You may not retake a quiz or take a quiz at a different time, no exceptions. If you have to miss a quiz – for any reason – it will count as your dropped quiz score. If you miss more than one quiz, you will receive a zero for each additional quiz you miss.
- **Final project (25%):** In lieu of a final exam, there will be a final project that will ask you to apply most of the concepts we have covered during the course. The project will be assigned during the last lecture on Friday June 6, and will be due on Wednesday June 10 by 11:59pm. **I will ask you to sign an agreement that you will not discuss the project with or receive help from *anyone* other than me or your TAs.**

Final grade:
Grade percentages will be converted to final numeric grades on a standard scale as follows:

% of points earned	100	90	80	70	60	50	40	30	20	10
Grade	4.0	3.6	3.2	2.8	2.4	2.0	1.6	1.2	0.8	0.0

Students with Disabilities
If you would like to request academic accommodations due to a disability, please contact Disabled Student Services, (206) 543-8924 to create a plan and obtain a letter detailing the plan. Please present the letter to me so we can privately discuss the accommodations you might need for this class.

Resources:
1. **Department of Statistics Tutor and Study Center**
Website: http://www.stat.washington.edu/tutorcenter/
Location: B023 Communications (CMU)
Offers free tutoring on statistics that can help you with homework, studying for quizzes, working on group projects, and answering statistical questions.
2. **Center for Social Science Computation and Research (CSSCR)**
Website: http://julius.csscr.washington.edu/default.htm
Consulting Office: 119 Savery Hall (SAV)
Drop-in computer lab: 118 Savery Hall (SAV)
Operates drop-in computer lab. Provides free consulting on using computer software for statistics five days a week, by drop-in or appointment.

Things you need to do to succeed in this class:

This course is designed around active learning principles. That means it is not a standard 50 minute lecture course and you will be expected to participate in activities and discussion in class. The following things will help you to succeed in this kind of course:

1. **Prepare:** Read and study the assigned sections of the text <u>before</u> class. This is where you will learn the content of the course.

2. **Participate:** Come to all sections and classes ready to participate. This is where you will practice and learn how to use the content in the textbook.

3. **Keep up:** Doing homework assignments soon after you have read the textbook and participated in class activities will help solidify your learning and ensure better retention.

4. **Use your friends and university resources:** Use the university resources for statistics and writing described on the course webpage. These are fantastic resources and are completely free. Also, form study teams to work on homework and practice explaining concepts.

5. **Turn on the statistical lens:** Think about the numbers, statistics and graphs that you see on the internet, in the newspaper, on TV, or in other classes. What do they tell you about the world? How do they relate to what we have been studying in this class? How could they be misinterpreted if you did not have statistical training?

6. **Ask questions**: If you are confused, others likely are too. You will be doing your classmates a favor, and make it easier to keep up, by asking the question early.

Academic Honesty:

While each student is encouraged to seek help with challenging concepts or assignments, all homework, quizzes, and exams are each student's responsibility, and should ultimately reflect each student's own work. Any student caught cheating or plagiarizing by the instructor or TAs on any assignment or examination will receive a grade of X for the course and will be reported to the Dean's office in the College of Arts and Sciences.

Class Rules:

Please, maintain a good learning environment by:

- Entering quietly and politely if you happen to arrive late
- Turning of the ringers on your cell phones and other devices
- Using your devices discretely for class related purposes
- Avoiding loud eating or talking

Tentative Course Schedule:

Lecture/Date	Topics	Reading (due before class)
Week 1	**Producing data**	
Mo 03/30	Introduction to the course and topical overview.	Moore: "To the Student"
Tu 03/31	TA section: **pre-test**	
We 04/01	Producing data: Surveys and sampling	Moore: Ch 8
Th 04/02	**LAB**	
Fri 04/03	Producing data: Experiments	Moore: Ch 9
Week 2	**Exploring data**	
Mo 04/06	More on data collection	
Tu 04/07	TA section	
We 04/08	Picturing distributions with graphs	Moore: Ch 1
Th 04/09	TA section: **QUIZ 1**	
Fri 04/10	Describing distributions with numbers	Moore: Ch 2
Week 3		
Mo 04/13	More on data description	
Tu 04/14	TA section	
We 04/15	The normal distribution	Moore: Ch 3
Th 04/16	**LAB**	
Fri 04/17	Scatterplots and correlation (TA lecture)	Moore: Ch 4
Week 4		
Mo 04/20	Regression	Moore: Ch5
Tu 04/21	TA section	
We 04/22	Review- Exploring data	Moore: Ch 7
Th 04/23	TA section: **QUIZ 2**	
Fri 04/24	More on data exploration	
Week 5	**From exploration to inference**	
Mo 04/27	Introducing probability	Moore: Ch 10
Tu 04/28	TA section	
We 04/29	Sampling distributions	Moore: Ch 11
Th 04/30	**LAB**	
Fri 05/01	More on probability	

Lecture/Date	Topics	Reading (due before class)
Week 6 Mo 05/04 Tu 05/05 We 05/06 Th 05/07 Fri 05/08	 Introduction to inference TA section Introduction to inference: Confidence intervals TA section: **QUIZ 3** Introduction to inference: Test of significance	Moore: Ch 14
Week 7 Mo 05/11 Tu 05/12 We 05/13 Th 05/14 Fri 05/15	 Thinking about inference TA section Review – From Exploration to inference **LAB** TA presentation – Real world use of statistics	 Moore: Ch 15 Moore: Ch 16
Week 8 Mo 05/18 Tu 05/19 We 05/20 Th 05/21 Fri 05/22	**Analyzing data** Inference about a population mean TA section Two sample problems TA section: **QUIZ 4** More on inference	 Moore: Ch 17 Moore: Ch 18
Week 9 Mo 05/25 Tu 05/26 We 05/27 Th 05/28 Fri 05/29	 No class on Mo 05/25 (Memorial Day) TA section Inference about Population Proportions TA section TA presentation – Real world use of statistics	 Moore: Ch 19-20
Week 10 Mo 06/01 Tu 06/02 We 06/03 Th 06/04 Fri 06/05	 Review – Inference about Variables TA section Course Wrap up TA section: **QUIZ 5** Project assignment	 Moore: Ch 21
Wed 06/10	Project reports due by 11:59pm	