

# SOAN 239: Social Statistics

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Office Hours: Mon: 2:00pm – 3:00pm  
Thurs: 8:30am – 9:30am  
Fri: 1:45pm – 2:45pm  
and by appointment, if necessary

## Course Description:

What does it for something to be statistically significant? This course will ask and answer this question by teaching social science students how to interpret data. This elementary statistics course covers descriptive and inferential statistics up to regression. Whenever possible, we will 'flip' the classroom -- using class time for activities and problem sets, and using out of class time for online lectures to introduce new material. We will focus on calculating and applying social statistics, rather than statistical theory. No prior knowledge of statistics is required.

## Course Goals:

In this introductory class for social statistics, the goal is first to develop an understanding of and proficiency in data analysis. We will first set the foundation of the 'nuts and bolts' of statistics. To do this, we will develop a tool kit to examine distributions of variables and the relationships between two variables.

But any good social scientist will go beyond just understanding the calculations. The broader goal is to develop students' statistical literacy to better understand how statistics fits in with social science research in general.

Last, the goal is for students to conduct a mini-statistical analysis project. Using a real dataset used by sociologists, you will work with your group to conduct a preliminary descriptive and inferential statistical analysis using SPSS. These findings will be presented to the class at the end of the term.

## Learning Outcomes

As a part of Carleton's assessment initiative, the SOAN Department has identified six Student Learning Outcomes for SOAN majors.

This course emphasizes the ability to:

- *Select appropriate sociological research methods to study socio-cultural phenomena*
- *Formulate appropriate sociological research questions about socio-cultural phenomena*

This course fulfills also fulfills part of Carleton's Quantitative Reasoning Encounter (QRE).

## Required Course Materials:

***Introduction to the Practice of Statistics 7<sup>th</sup> Edition.*** Moore, David S., McCabe, George P., Craig, Bruce A. 2012. New York: W.H. Freeman and Company.

**Open Learning Initiative:** The cost to register as a student at an academic institution is usually around \$30 but this year you are in luck since the enrollment cost is covered by a grant from the Gates Foundation.

For exams, you will need access to a calculator that isn't a smart phone. It can be a very simple calculator.

**Additional readings will be posted on Moodle.**

We will start the course by doing a close reading of the article, "*How different are the adult children of parents who have same-sex relationships? Findings from the New Family Structures Study.*" This article was written by Mark Regnerus and has raised significant controversy among social scientists. The article will provide us with a useful case study for thinking about bias in data collection and the role of inference in social science.

**SPSS**

We will be using the statistical software *SPSS* to conduct data analysis. Unlike R (another program), *SPSS* has a very user-friendly interface and is among the most widely used statistical software packages across multiple industries. But it isn't cheap. Carleton pays for licenses on some campus computers.

You do NOT need to do the OLI assignments that require statistical software. I will create separate assignments using *SPSS*.

**SPSS is available on the following campus computers:**

CMC 109, 101

Leighton: 231 (the SOAN lounge)

Library: 425, 305, 306, 318

Olin 112

Willis 119

Note: This is not an exhaustive list. If you want to check to see if another campus computer offers *SPSS*, you can find [a master list here](#).

**Class Assignments and Grades:**

Test 1: 15%

Test 2: 20%

Test 3 (Final Exam): 25%

Group Presentation: 15%

OLI homework: 8%

Written Homework: 7%

Attendance and Participation: 10%

Grades will be assigned according to the following distribution:

A	100-94	B+	<90-88	C+	<80-78	D+	<70-68
		B	<88-84	C	<78-74	D	<68-60
A-	<94-90	B-	<84-80	C-	<74-70	F	<60

### Calendar of Important Dates

Day	Date	Test
Monday	April 17	Exam 1 in class
Wednesday	May 10	Exam 2 in class
Ongoing	5/26, 5/29, 5/31	In class group presentations
Sunday	June 4	Final Exam, in class 3:30pm

### Computer Lab Dates

We are tentatively scheduled to go to the computer lab (CMC 110) on the following days. These days will include more hands-on work when you can practice analyzing data using SPSS.

Date	Where
Friday March 31	CMC 110
Friday April 7	CMC 110
Friday April 28	CMC 110
Friday May 5	CMC 110
Monday May 22	CMC 110
Monday May 24	CMC 110

### Homework

Learning statistics is a lot like learning a foreign language – in order to get better, you have to practice every day. Thus, we will do a lot of assignments and problems both in class and at home.

**OLI Homework:** Most nights, there will be student-led work where you will be expected to go through the course and problems on your own. Through the OLI, I am able to see how well you are following along. Your OLI homework grade is based on your effort. If you attempt it, you'll get full credit.

**Written Homework:** You will have almost weekly homework where you will be required to do a few problems each night. I will post the problems on Moodle. You will hand in the finished problems on Friday. I will grade the homework  $\checkmark$ -,  $\checkmark$ , or  $\checkmark$ +

**Get to know your professors:** Carleton will pay for you to take two professors per term to lunch at the college dining hall. I imagine that this is an under-utilized perk of your tuition dollars. Take advantage of it.

**Academic Integrity:**

In line with Carleton’s policy on academic integrity, it is assumed that the student is the author of all coursework. Please refer to Carleton’s full policy for additional information or see me if you have questions. <http://apps.carleton.edu/campus/doc/integrity/>

**Disability Services for Students:**

Carleton College is committed to providing equitable access to learning opportunities for all students. The Disability Services office (Burton Hall 03) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations. If you have, or think you may have, a disability (e.g., mental health, attentional, learning, autism spectrum disorders, chronic health, traumatic brain injury and concussions, sensory, or physical), please contact Chris Dallager, Director of Disability Services, by calling 507-222-5250 or sending an email to [cdallager@carleton.edu](mailto:cdallager@carleton.edu) to arrange a confidential discussion regarding equitable access and reasonable accommodations.

**Classroom Guidelines for Pronouns**

It is important that the classroom be a respectful environment where everyone can participate comfortably. One part of this is that everyone should be referred to by their chosen name, the correct pronunciation of their name, and their chosen pronouns. Below is a list of available pronouns. Note: While “They” is listed as a singular pronoun, I would like to encourage you to use an alternative pronoun because of the grammatical implications. Part of my job as your professor is to help prepare you to write well, including correcting your grammar. For students who feel strongly about using the pronoun they in the singular, please see me so we can set some guidelines for your written work.

Subjective	Objective	Possessive Adjective	Possessive Pronoun	Reflexive
She	Her	Her	Hers	Herself
Ze	Zim	Zir	Zirs	Zirself
Xe	Xem	Xyr	Xyrs	Xemself
They	Them	Their	Theirs	Themselves
Sie/zie	Hir	Hir	Hirs	Hirself
Zie	Zir	Zir	Zirs	Zirself
Ey	Em	Eir	Eirs	Eirself
Per	Per	Pers	Pers	Perself
He	Him	His	His	Himself

### **Attendance/Class participation/Respectful use of electronic devices**

Just showing up to class is not sufficient. You are encouraged to speak up and ask questions. *There is no such thing as a stupid question!*

Students who are consistently tardy or miss three or more classes will forfeit their participation grade. The “default” participation grade is 5 out of 10, so students who actively and productively contribute to class will substantially increase their grades. Egregious absenteeism and tardiness will significantly affect your grade beyond participation points.

I am a reasonable person so should you have an extenuating circumstance and the documentation to verify it (i.e. a note from a doctor, class dean, etc.), we can work something out.

It should go without saying but in addition to being present, students should refrain from inappropriately using electronic devices during class time.

### **Open Learning Initiative**

This course will continue to use an online textbook/platform called the open learning initiative. I will provide details during week 1 how to register for the course. Using this program, we will attempt to partially ‘flip’ the classroom by using student-directed learning at night and doing group work and problem sets during class time.

The expectation is that you will keep up with the material on a daily basis and that you will complete your work *before 8am* the day of class. That way I can plan accordingly for class later that day.

Please do not do the exercises on a smart phone. You will need more screen real estate – ideally a large monitor screen so you can toggle back and forth between windows.

### **Most days, classes will be structured as followed:**

Review material that gave students trouble from the homework  
Activity, problems, applications  
Preview new material

### **Student Flexibility**

Students who have had class with me know that I pride myself on my organization and professionalism. My courses are usually charted out so that students know what to expect from the first day of class. I am asking you all to be a little more flexible this term. Since I am trying to get a sense of your previous knowledge of statistics and we are using a relatively new interface with OLI, I think there is benefit to being nimble. I have charted out the general arc of the course but I ask you to be flexible. NOTE: Important dates like tests and group presentations will not change.

You may ask yourself, *why are we using a new approach to teaching statistics?* Good question! Studies have shown that this approach to learning statistics may be particularly beneficial in terms of fostering student engagement and helping students retain content. The onus is more on the student in terms of keeping up with the work, but the pedagogical payoff tends to be higher.

### Tentative Schedule

**Note: This is a general outline of what to expect. Some of the details are likely to change but the overall arc of the course will follow the trajectory listed below:**

Topic	Text Book	OLI
<b>Part 1: Exploratory Data Analyses with 1 variable</b>		
One categorical variable	Chapter 1.1	Exploratory Data Analysis
One quantitative variable	1.2	EDA: Measures of Center and Spread
Range, IQR, Outliers	1.2	
Boxplots	1.2	
Standard Deviation	1.2	
<b>Part 2: Exploratory Data Analyses with 2 variables</b>		
	Chapter 2: Intro	EDA: Relationships
Relationships between categorical variables	2.5	Case C-->C
Relationships between a categorical and quantitative variable	NA	Case C-->Q
Relationships between two quantitative variables	2.1, 2.2	Case Q-->Q
<b>Part 3: Producing Data and Sampling</b>		
Sampling and bias	Chapter 3.2	Producing Data: Sampling
Operationalizing variables	Regnerus article	Observational Studies
<b>Part 4: Probability</b>		
Why we need probability for inference	Chapter 3.3	Probability: Introduction

		Probability: Sampling Distributions
<b>Part 5: Random Variables</b>	Chapter 4.3	Probability: Random Variables
Discrete and Continuous Random Variables	4.3	Discrete and Continuous
Normal Random Variables	1.3	Normal Random Variables
<b>Part 6: Sampling Distributions</b>		Probability: Sampling Distributions
Sample Proportion	Chapter 5.2	Behavior of a Sample Proportion
Sample means	5.1	Behavior of a Sample Mean
<b>Part 7: Inference for a single mean or proportion</b>	Chapter 6.1	Introduction to Inference
Point estimation and confidence intervals	6.1	Point Estimation
Estimation: Sample Proportions	8.1	Estimation: Population Proportion
Estimation: Sample Means		Estimation: Population Mean
<b>Part 8: Hypothesis testing for population proportion</b>	Chapter 6.2	Hypothesis Testing for Population Proportion
z-tests for the population proportion	6.2, 8.1	z-tests for the population proportion
<b>Part 9: Hypothesis Testing for the population mean</b>	Chapter 7.1	Hypothesis Testing for the Population Mean

t-tests for the population mean	7.1	Z-test population mean & T-Test population mean
<b>Part 9.5 Hypothesis Testing for Differences in Proportions and Means</b>		
Hypothesis Tests for Differences in Proportions	Chapter 8.2	Inference: Hypothesis Testing for Two Population Proportions
Hypothesis Tests for Differences in Means	Chapter 7.2	
<b>Part 10: Hypothesis Testing for Relationships between Two Categorical Variables</b>		
Chi Square Tests for Independence	Chapter 9.1	Inference: Relationships C->C