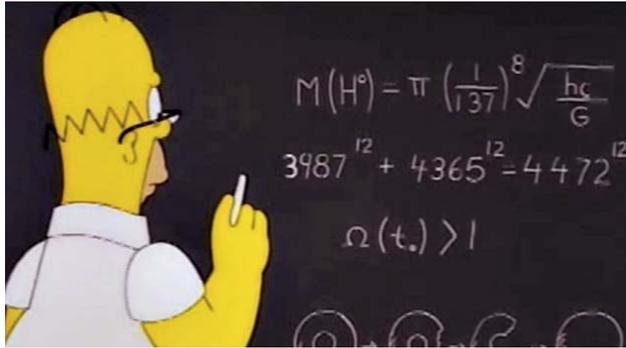# UP116 | Urban Informatics 1 | Spring 2017

Instructor: Stephen Averill Sherman, sashermn@illinois.edu
Teaching Assistant: Rojan Thomas Joseph, rtj2@illinois.edu
Lectures: Monday/Wednesday in Temple Hoyne Buell Hall (TBH) Room 225, 1:00 to 1:50pm
Labs: Friday in the ACES Instruction Computer Lab Room 29, 1:00-1:50pm (basement of ACES library)
Office Hours:
Steve: Wednesday 2:00PM-4:00PM, 310 Noble Hall
Rojan: Thursday 3:00PM-5:00PM, 227 Temple Buell Hall

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1. OVERVIEW

This class has two major goals.

This first goal: students will feel comfortable using a set of basic mathematical and statistical techniques. Specifically, you will learn quantitative research techniques frequently used in Planning, the Social Sciences, and related fields/professions. Among the topics covered are:

- Descriptive vs. inferential statistics
- Types of variables
- Measures of central tendency & dispersion
- Sampling and estimation
- Hypothesis testing (t, chi square, normal)
- ANOVA
- Introduction to regression analysis

The second overarching goal of this course is to build research skills, particularly with survey methods. Through the course of the semester you will develop, conduct, and write your own self-guided research project using your own survey data. Among the tasks completed will be a literature review, a survey design, survey implementation, survey analysis, and writing/presenting your research findings.

This class also will also introduce you to elementary statistical analysis. You may or may not consider yourself a "numbers person," but it's important to remember that, in Planning, we use numbers and statistical analysis in order to make arguments about real, actual stuff: cities, people, jobs, and whatnot. I aim, as an instructor, to take you over that all too common "math anxiety" hump and help you help yourselves in your future careers. Although homework will be assigned to directly practice the techniques discussed in class, the bulk of the course will entail completing a project that can be used as a writing sample when seeking an internship or first job.

2. OBJECTIVES

By the end of the semester, each student will:

1. Understand the value of statistics in their daily life and career, while also keeping a healthy dose of scepticism;
2. Understand the basic foundational statistical concepts of data, variation, and inference;
3. Understand and critically examine statistics used in urban planning and policy research;
4. Be able to formulate a research question, collect data, and use statistical software and methods to analyse the data; and,
5. Know how to better communicate and make an argument with numbers.

3. COURSE MATERIALS

Two books are required:

1. Joseph P. Healey. 2011. *Statistics: A tool for social research, 10th Edition*. Belmont, CA: Thomas Wadsworth.
2. Edward Tufte. 2001. *The Visual Display of Quantitative Information, 2nd Edition*. Graphics Press, Cheshire, Connecticut.

A one-semester student subscription to surveygizmo.com is also required. Details on obtaining this will be discussed during class.

4. REQUIREMENTS AND GRADING

Your grade will be based on the following:

Component	Percentage
Concept Quizzes	20%
Homework Assignments	20%
Attendance	10%
Final Project	40%
Presentation	10%
Total	**100%**

I will assess final grades with the following schedule:

A+:97.0 or higher	B-:80-83.99	D+:67-69.99
A: 94.0-96.99	C+: 77-79.99	D: 64-66.99
A-: 90-93.99	C: 74-76.99	D-: 60-63.99
B+: 87-89.99	C-: 70-73.99	F: 59.99 or less
B: 84-86.99		

Attendance

Attendance forms 10% of your grade. Simply showing up makes a huge difference. I don't enforce attendance simply because I like seeing students in seats; rather, *you need to be mentally present in the classroom.* I have a vested interest in you learning the class material (as should you). I don't like reading sub-par student work. Therefore, I incentivize your presence through grading. So show up: it's an easy way to boost your grade (and, likewise, an easy way to hurt it by failing to attend).

You are granted three unexcused absences; all absences beyond that will entail loss of one percentage point of your final grade. I will grant excuses for acceptable reasons, of which illness, a job interview, or a family emergency are among the acceptable reasons. "It's too cold outside" or "I have a lot of assignments in my other classes" are not acceptable reasons. *If you need to miss class, you are responsible for obtaining notes from your classmates and learning the material on your own.* I use Compass, and I will post lectures slides there.

Concept Quizzes

Throughout the semester we will have 5 concept quizzes. These quizzes assess your knowledge of certain statistical, research method, or survey method concepts. Knowledge of these concepts will be crucial to you completing an excellent final research project, so you need sound knowledge of them. Regular assessments will assure that you're "staying on track."

I will drop the lowest quiz score.

Note that our first concept quiz is this Friday, January 27. Keep reading this syllabus to help yourself with that quiz.

Homework Assignments

Homework assignments provide a crucial opportunity to practice the material. We will start most homework assignments in lab. Consult each assignment prompt for the due date. A hardcopy should be turned in at the beginning of class. **Late assignments will be deducted 10 percent each day.** Do not expect extensions for reasons beside medical or family emergencies.

I will drop the individual assignment with the lowest grade.

Final Project and Presentation

You have several 'mini' Project Assignments (PAs) throughout the semester, the sum of which accrete into your final project. Each PA represents a major section of your final project (e.g., sources, literature review, survey, survey design, statistical analysis). I will post each PA separately on Compass and we will discuss it during class.

Your final project grade (40% of your class grade) will be the average of the 1) individual PA grades, and 2) the completed final project grade. When you turn in each PA, I will provide critical feedback that you will take into account in your final assignment.

You will sign up for a day at the end of the semester to present your findings to the rest of the class.

5. COURSE WEBSITE

The course website is central to this class. The course website is located on Compass: compass.illinois.edu

You should frequently check the Compass updates for posted lecture notes, homework assignments, and PAs.

6. LAB TIME

You are required to attend your assigned lab time as well as the lectures each week. The labs provide an opportunity for feedback, questions, and direct assistance on your final project. Although most of the time spent in the lab will be self-directed, I have scheduled workshops that will introduce you to software you will be using on your final project and homework assignments.

7. STUDY GROUPS

All students in the class will be assigned to a study group. Study groups are expected to get together at least once a week to help each other with homework assignments. If you cannot meet regularly with the group to which you are assigned, please let me know within the first two weeks of the term and I will assign you to a different group. Although students are encouraged to help each other with the homework assignments, each student is responsible for his or her own individual work. This means that each student will turn in his or her own homework and receive an individual grade. **Copying your study groups' work is plagiarism.**

8. COURSE POLICIES

Disability Services: This course will accommodate students with documented disabilities. Please refer to the Disability Resource Guide at (http://www.disability.uiuc.edu/resourceguide) for more information. Please inform the instructor of any requests as soon as possible, preferably before the first week of class is over.

Laptops, phones, and technology: Short version: **You cannot use a laptop or phone in class.** Calculators are fine. Laptops are OK on some days if we're doing technology-related stuff during non-lab times (but this will be very rare).

Long version: I have many specific rules about technology in the classroom. I do not do this because I enjoy being needlessly strict; rather, as your instructor, I must ensure that as many students as possible learn the material. Thus I must remove all impediments to learning. Unfortunately, laptops – despite ostensibly being a "learning technology" – frequently inhibit concentration and, therefore, learning. People waste time checking social media, writing emails to other professors, and doing other activities totally irrelevant to statistics[1].

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[1] An illustrative anecdote: while in grad school I was sitting by a student using their laptop during class. They took a brief break from note-taking to check email (as I could see on their screen). They were a good student who was easily distracted, as is wont to happen when a screen is in front of someone. In their email they received some kind of tragic news, and immediately started crying. For the last ten minutes of class they awkwardly, quietly cried, and thus created a small scene, compounding whatever negative feelings they were already feeling. The moral: you can't control what you see when distracted by the internet. An easy solution? *Don't have your laptop open.*

Let the record state that I am a devoted Luddite who vociferously hates in-classroom laptops. I have attempted to be lenient with laptops in the classes. *We live in 2017*, I tell myself, *computers are ubiquitous, so why should students not have laptops?* Sadly, it's become obvious that laptops detract much more from students' experience than they add. Furthermore, I've conducted an experiment through the past two semesters, and I've found that a lower performing student is statistically more likely to be a laptop user. [It's easy to explain why, as study after study has found laptops to be a detriment to concentration](), and, thus, the ability to learn class material.

So therefore *I WILL NOT ALLOW IN-CLASS LAPTOPS IN UP116.* Bring pencils and paper, and take notes like ye olden days.

As we will sometimes be using computer programs in the classroom, these rules will not be enforced on certain days. The ACES library lab has a computer for each of you, and will not need to bring a computer on lab days.

If you need a laptop due to special accommodations, please contact me outside of class time.

I categorically forbid phones in class. If you have a phone out, I will not hesitate to ask you to put it away. The first callout is a warning. I will keep tally and detract one point off of your final grade for each additional time I see you with a phone out. Use a calculator for calculations.

Respectful environment: The Department of Urban and Regional Planning (DURP) is committed to maintaining a learning environment that is rooted in the goals and responsibilities of professional planners. By enrolling in a class offered by the Department of Urban and Regional Planning, students agree to be responsible for maintaining an atmosphere of mutual respect in all DURP activities, including lectures, discussions, labs, projects, and extracurricular programs. See Student Code Article 1-Student Rights and Responsibilities, Part 1. Student Rights: §1-102.

Academic Integrity & Plagiarism: The UIUC Student Code (http://www.admin.uiuc.edu/policy/code) requires all students to support academic integrity and abide by its provisions, which prohibit cheating, fabrication, plagiarism, and facilitation of these and related infractions.

Don't plagiarize. The only thing that I dislike more than in-class technological distractions is plagiarism. Consult the student code for the exact definition of plagiarism. If caught, you will receive a zero for the assignment and potentially additional punishment (as severe as a F in the course or expulsion from the University). Professorial real talk: should you feel yourself overwhelmed by an assignment and are tempted to plagiarize, just don't do it. It's much more prudent to hand in a sub-par assignment that will net you a grade in the 50s than to hand in a plagiarized piece that will net you a zero (or potentially worse). Another option: plan ahead of time, so should you feel overwhelmed by the assignment you will be aware of this fact more than 72 hours before the deadline. I will run a plagiarism check on all major assignments using Compass.

I use humor a lot in the class (see the last paragraph for example), but I do not joke about academic integrity.

A short note on grades, classwork, and other matters: I am not an ogre. Life happens in weird ways, unexpected things occur, and I understand that. I make myself available via e-mail and through regular office hours in order to help students through the material, and address special concerns (and if I can't address them meaningfully, direct you towards campus resources which can

address whatever concern you have). This being noted, the grade you earn will be the grade for which you did the work.

If you want an A in the class, do the following:

- Follow all assignment prompts, and do "A" quality work on them
- Hand in your work on time
- Read the required readings (this will especially help cement the math concepts)
- Show up for class
- Pay attention to lectures and take meaningful notes
- Study for quizzes
- Think critically about the subject matter when completing assignments

Everyone has an A on the first day. Just do the necessary work to maintain that.

Emergency situations: In the event of a tornado warning on lab days, we are fine (as the ACES lab is in the basement). Should a tornado warning happen while we are in TBH, the designated tornado safe area is in on the atrium level, down the hallway on the east side of the atrium level (by the MUP lockers). Should a tornado warning be issued for Champaign County, we will postpone class and go there until the warning is lifted.

In the event of an active shooter, here is the "Run, Hide, Fight" language from the UIPD's website:
When we're faced with any kind of emergency – like fire, severe weather or if someone is trying to hurt you – we have three options: run, hide or fight.

Run
Leaving the area quickly is the best option if it is safe to do so.
Take time now to learn the different ways to leave your building.
Leave personal items behind.
Assist those who need help, but consider whether doing so puts yourself at risk.
Alert authorities of the emergency when it is safe to do so.

Hide
When you can't or don't want to run, take shelter indoors.
Take time now to learn the different ways to seek shelter in your building.
If severe weather is imminent, proceed to the nearest indoor storm refuge area.
If someone is trying to hurt you and you can't evacuate, get to a place where you can't be seen, lock or barricade your area, silence your phone, don't make any noise and don't come out until you receive an Illini-Alert indicating it is safe to do so.

Fight
You may need to fight to increase your chances of survival.
Think about what kind of common items are in your area which you can use to defend yourself.
Team up with others to fight if the situation allows.
Mentally prepare yourself – you may be in a fight for your life.
Please be aware of persons with disabilities who may need additional assistance in emergency situations.

On a related note: should you overwhelmed by life in general, the Champaign County Crisis line is 24/7 and can be reached here: (217) 359-4141. The Counseling Center on campus – while not 24/7 – can make you an appointment on the same business day. Call (217) 333-3704 as close to 8AM as possible.

Syllabus quiz: A lighter note: as I stated on the first day of class, 1) you are responsible for reading the syllabus before the first lab, and 2) you will be quizzed on the syllabus. If you are reading this, then you've read the syllabus to the end. So this is your quiz: before Friday's lab, you must e-mail me a picture of retired basketball player Shaquille O'Neal. You will receive full credit *on the syllabus*

portion of the quiz if I receive any picture of Shaq in my inbox (i.e., you still must read the writing guide), and I will make a photo collage of Shaq pictures to put onto the quiz. Though I will not give extra credit for funnier pictures, they will be appreciated by me and your classmates.

9. CLASS SCHEDULE

Date	Topic	Reading to be Completed	Assignments Due
Week 1 – Introduction and Math Review			
Monday, January 16th	**No Class – MLK Jr. Day**		
Wednesday, January 18th	Introduction to course		
Friday, January 20nd	Lab: Word document basics; assign study groups	Steve's Writing Guide Syllabus	Concept Quiz 1
Week 2 – Basic Descriptive Statistics			
Monday, January 23th	Math review; basics of measurement	Chapter 1	
Wednesday, January 25th	Intro to Research Questions and Basic Descriptive Statistics	Chapter 2	
Friday, January 27th	Lab: Work day		HW1 due
Week 3 – Measures of Central Tendency and Dispersion			
Monday, January 30th	Measures of Central Tendency	Chapter 3	PA1: Research Question and citations due
Wednesday, February 1st	Measures of Dispersion	Chapter 4	
Friday, February 3rd	Lab: SurveyGizmo Workshop		Concept Quiz 2
Week 4 – Probability and the Normal Curve			
Monday, February 6th	Normal Curve	Portion of Chapter 5 (pg. 122-133)	
Wednesday, February 8th	Normal Curve and Probability	Portion of Chapter 5 (pg. 133-142) and all of Chapter 6	
Friday, February 10th	Lab: workday		HW2 due PA2: Literature Review and Introduction due
Week 5 – Estimation and Asking Questions with Data			
Monday, February 13th	Estimation	Chapter 7	
Wednesday, February 15th	Estimation		
Friday, February 17th	Lab: Excel workshop		PA3: Draft Survey Questionnaire Due

Date	Topic	Reading to be Completed	Assignments Due
			Concept Quiz 3
Week 6 – Asking Questions with Data			
Monday, February 20th	Hypothesis Testing – One Sample Case	Chapter 8	
Wednesday, February 22nd	Hypothesis Testing – One Sample Case		
Friday, February 24th	Lab: workday		PA4: Final Survey Questionnaire Due HW 3 Due
Week 7 – Asking Questions with Data			
Monday, February 27th	Hypothesis Testing – Review	Chapter 9	
Wednesday, March 1st	Hypothesis Testing – Two Samples		
Friday, March 3rd	Lab: SPSS basics		
Week 8 – Measures of Association			
Monday, March 6th	Hypothesis Testing	Chapter 10, 11	PA5: Methods Section Due
Wednesday, March 8th	Hypothesis Testing		
Friday, March 10th	Lab: workday		HW4 Due
Week 9 – Measures of Association			
Monday, March 13th	Chi Square in Excel	Chapter 10, 11	
Wednesday, March 15th	ANOVA		
Friday, March 17th	Lab: workday		Concept Quiz 4
Week 10 – SPRING BREAK			
Week 11 –Bivariate Tables and Regression			
Monday, March 27th	SPSS and Chi Square		All surveys completed
Wednesday, March 29th	ANOVA and Association between variables measured at the Nominal Level	Portion of Chapter 12 (pg. 308-323) Tufte, pg. 1-79	
Friday, March 31st	Lab: workday		HW 5 due

Date	Topic	Reading to be Completed	Assignments Due
Week 12 – Planning data and questions			
Monday, April 3rd	Visualizing data	Tufte, pg. 80-138	PA6: Initial Survey Analysis
Wednesday, April 5th	Association between variables measured at the Ordinal and Interval-Ratio Level	Tufte, pg. 139-end; Portion of Chapter 12 (pg. 324-341), 13	
Friday, April 7th	Lab: workday		HW6 Due
Week 13 – Regression			
Monday, April 10th	Regression	Chapter 15	
Wednesday, April 12th	Regression		
Friday, April 14th	Lab: workday		Concept Quiz 5
Week 14 - Technology and Communication with Statistics			
Monday, April 17th	Regression		
Wednesday, April 19th	**NO CLASS**		
Friday, April 21st	**NO CLASS**		HW7 Due PA7: Results section and visualizing data
Week 15 - Presentations			
Monday, April 24th	Final Presentations		
Wednesday, April 26th	Final Presentations		
Friday, April 28th	Lab: workday		
Week 16 - Presentations			
Monday, May 1st	Final Presentations		
Wednesday, May 3rd	Final Presentations		Final Paper Due by 10pm

- Although I will make every effort to follow the above schedule, some variations are inevitable. If you miss class, it is your responsibility to find out what you missed from another student.