UP 116 Urban Informatics

Lecture: 10:00AM - 10:50AM Mon/Wed, 219 David Kinley Hall

Lab: 10:00AM - 10:50AM Friday, 101 901 W Oregon

Instructor: Dr. Fang Fang (fangf@illinois.edu)

Office Hours: 9:00-11:00am Thursday

TA: Srirang Sohoni (ssohon3@illinois.edu)

Office Hours: 11:30-1:30pm Friday

Course Overview:

This is the introductory urban informatics course for undergraduate students. A set of fundamental mathematical and statistical techniques will be introduced. Topics will cover quantitative research techniques that are frequently used in planning and social sciences fields. Typical topics include: Descriptive and inferential statistics, probability, measures of central tendency and dispersion, sampling and estimation, hypothesis testing and analysis of variance (ANOVA).
This syllabus is subject to change by the instructor.

Course Outcomes:

1. Understand the basic statistical concepts, hypotheses and theories related to social science.
2. Apply the fundamental and basic quantitative statistical techniques in social research.
3. Develop a basic knowledge of statistical analysis using RStudio.
4. Have the ability to interpret results of statistical tests especially in urban planning discipline.
5. Build knowledge of the basics of inferential statistics.

Course Structure/Philosophy/Attendance

- This is a 16-week 3 credits course. Each student is expected to devote ~2 hours per week learning the lecture contents, and 1-2 hours for labs exercise per week.
- Attendance: Your full participation and presence in all classes are expected. Please contact me/TA prior to the course session which you are absent from. You get three “free” absence for the entire semester. Attendance are calculated as a percentage of number of classes attended (excluding excused absences) and scaled out of 100 points. I firmly believe that students learn via engagement and by doing. As a result, this will not be a pure lecture-based course. It is important to engage yourself during this class. I will do my best to help you learn; however, it is imperative that you take ownership of your education. Feel free to email me if you need help. The engagement is demonstrated in various ways for lectures and labs: e.g. in-class discussion, in-class exercise, in-class group work, etc.
- All the assignments, exams, and labs are mandatory. Please contact the instructor asap for any unavoidable circumstances e.g. due to COVID-19. Excused absences, asynchronous participation etc will be granted on a case-by-case basis.

Required Text
Statistics: A Tool for Social Research 10th Edition
by Joseph F. Healey

Software
Students can install RStudio on their personal computers for free through
https://rstudio.com/products/rstudio/download/

Grading:
Grading for this class will consist of two exams, 11 labs and attendance.
The midterm and final exams (time TBD) will be a combination of multiple-choice, true-and-false, and short answer questions. Instead of regurgitating facts, my tests are designed so that you think about the key concepts of the topics we have covered. The exam cannot be re-taken.

Consistent with UIUC guidelines, if you cannot take a regularly scheduled exam because of authorized University activities, you will have the opportunity to take a make-up exam at an alternate time. Make-up exams for absences due to any other reason will be at the discretion of the instructor. You must notify me beforehand if you need to miss an exam. I will not let you make up an exam without prior notification.

In addition to the exams, you will be asked to complete 11 assignments, which will build on concepts from the lectures. Note the dates of these assignments in the schedule below. **Assignments must be turned in via Canvas submission. You will receive a zero on the assignment if it is not submitted. The lowest grade among the 11 assignments will be dropped.**

Attendance will be worth 100 points. This will be calculated as a percentage as the number of classes attended divided by the number of classes scaled out of 100 points. You will not be penalized for excused university absences. Other excused absences may be granted at the discretion of the instructor for e.g. COVID-19, health emergencies or in situations where religious beliefs, observances, and practices or work requirements irregularly conflict with course attendance. The first three absences will not be held against you.

Grade Point Distribution:

Lab Assignments*10	50 Points Each, 500 Points Total
Mid-term Exam	200 Points
Final exam	200 Points
Attendance	100 Points
Total	**1000 Points**

Grade Scale:

Letter grade	Percentage	Points
A+	97–100%	>970
A	93–96.99%	>930
A–	90–92.99%	>900
B+	87–89.99%	>870
B	83–86.99%	>830
B–	80–82.99%	>800
C+	77–79.99%	>770
C	73–76.99%	>730
C-	70–72.99%	>700
D+	67–69.99%	>670
D	63–66.99%	>630
D-	60–62.99%	>600
F	0–59.99%	<600

Late submission

Assignments are due on each Friday, ***10:00 am*** the following week they are assigned. (For example, assignment 1 assigned on Jan28th will be due by Feb 4th at 10:00 am). You should submit your assignment as word doc on Canvas website.

Assignments must be turned in via Canvas submission. You will receive a zero on the assignment if it is not submitted.

An assignment submitted 24 hours or less after the due date will only be eligible for 80% of the maximum number of points allotted. Assignments submitted more than 24 hours but less than 48 hours after the due date will only be eligible for 60% of the maximum number of points allotted, and so on. Assignments submitted **more than 120 hours (or 5 days)** after the due date **will NOT be accepted and you will receive a zero on that assignment**. If you experience extenuating circumstances (e.g., you are hospitalized) that prohibit you from submitting your assignments on time, please let me know. I will evaluate these instances on a case-by-case basis. You are responsible to confirm each submission in Canvas. **For any technical issues in Canvas/Netid, you need to contact me in advance or email your assignment to me ASAP by the deadline. Otherwise, the late work policy will be strictly enforced.**

Error/warning messages are common in R, and these are NOT the valid excuses for late submission.

Cellphone, Tablets, and Computers:

Instructions for this course will be in in-person. Students are expected to be present during the synchronous lecture and lab hours. Cell phone use of any kind will not be tolerated.

Academic Integrity

We will follow Articles 1-401 through 1-406 of the Student Code. The provisions of the Student Code are applicable to this course. This rule defines infractions of academic integrity, which include but are not limited to cheating, fabrication, and plagiarism. You are responsible for following these guidelines. If you have any questions about whether something would be an infraction, consult with the instructor before proceeding.

Special Accommodations

We will accommodate students with documented disabilities. Please be familiar with the services and resources provided by Disability Resources and Educational Services (DRES) and visit (http://disability.illinois.edu/disability-resource-guide) for more information. Please inform the instructor of any requests at the beginning of the semester.

Run > Hide > Fight

Emergencies can happen anywhere and at any time. It is important that we take a minute to prepare for a situation in which our safety or even our lives could depend on our ability to react quickly. When we're faced with almost any kind of emergency – like severe weather or if someone is trying to hurt you – we have three options: Run, hide or fight.

Feedback Response Time

I generally reply to email and discussion posts within 48 hours, except during holidays. Often I will reply much more quickly, but you should not count on a same-day reply. Please plan accordingly so that you don't miss deadlines! I generally return assignments within one week of when a discussion or assignment closes. If you would like to get help on an assignment ahead of the deadline, please email me! I'm happy to give preliminary feedback or answer questions.

Emergency Response Recommendations:

Emergency response recommendations can be found at the following website: http://police.illinois.edu/emergency-preparedness/. I encourage you to review this website and the campus building floor plans website within the first 10 days of class. http://police.illinois.edu/emergency-preparedness/building-emergency-action-plans/.

Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See https://registrar.illinois.edu/academic-records/ferpa/ for more information on FERPA.

Sexual Misconduct Policy and Reporting

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX and Disability Office. In turn, an individual with the Title IX and Disability Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

Tips for Succeeding in this Course

1. Get help early on if you are having difficulties. Come to my office if you need to. If my office hours don't work for you, we can work something out.
2. Get to know others in the class. Help each other out.
3. If I give bonus opportunities, take advantage of them.
4. If I give study guides, take advantage of them.
5. If a book is required, get the book and us it.
6. Your goal should not be to pass; shoot for an A.
7. If I give a writing assignment it will have a rubric attached. Use this rubric because this is what I'm looking for.
8. If I give a writing assignment, don't hesitate to get help.
9. Be open-minded. I understand that this class may not be within your subject of interest, but that doesn't mean you can't take interest. It's easier to learn something you have an interest in.

	Week	Lectures	Book chapter	Friday Labs
1	17-Jan	Introduction to course		AS0: R Studio Intro – installation and workspaces
2	24-Jan	Basics of descriptive statistics	Ch 2Basic descriptive statistics	AS1: Basic descriptive Stats
3	31-Jan	Measures of central tendency	Ch 3 Measures of Central Tendency	AS2: Measure of central tendency in R
4	7-Feb	Probability, Normal Curve and measures of dispersion	Ch 4 Measures of Dispersion, Ch5 the normal curve	AS3: R workshop – dispersion
5	14-Feb	Normal curve and probability	Ch 5 the normal curve	AS4: Normal curve using R
6	21-Feb	Estimation, Hypothesis Testing – One sample test	Ch 7 Estimation Procedures, Ch8 Hypothesis testing I	AS5: Inferential statistics
7	28-Feb	Hypothesis Testing – two samples	Ch 9 Hypothesis testhing II	AS6: Hypothesis testing
8	7-Mar	Review		Midterm exam
9	14-Mar	Spring break		
10	21-Mar	ANOVA (1)	Ch 10 Hypothesis testing III	AS7: ANOVA1
11	28-Mar	ANOVA (2)	Ch 10 Hypothesis testing III	AS8: ANOVA2
12	4-Apr	Chi square	Ch 11 Hypothesis testhing IV	AS9: R workshop –chi square
13	11-Apr	Measure of Association	Ch 12 Bivariate measures of association for nominal/ordinal variables	AS10: R workshop – Measure of Association
14	18-Apr	Regression 1	Ch 13 Assosication between variables at the interval ratio level	AS11: R workshop – regression
15	25-Apr	Regression 2	Ch 13 Assosication between variables at the interval ratio level	
16	2-May	Review		Final exam