STAT 210: INTRODUCTORY STATISTICS FOR THE SOCIAL SCIENCES
Fall 2019
MWF 11:00 - 11:50 PM, Fisk Hall 217
Dr. Jeffrey T. Lewis (ECON)
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Office Hours: Monday 1:15-3:00, Wednesday 1:15-3:00, Thursday 2:00-3:00, Friday 1:15-3:00/ (or by appointment)

Teaching Assistant	Section Times/Locations
TA Martha Eichlersmith	21: Tu, 5:00-5:50, Lunt Hall 107
TA Martha Eichlersmith	22: Th, 4:00-4:50, Swift Hall 107
TA Tim Lau	23: Tu, 5:00-5:50, Lunt Hall 105
TA Tim Lau	24: Th, 4:00-4:50, Locy Hall 301
TA Wei Ju	25: Tu, 5:00-5:50, Harris Hall L07
	26: Th, 4:00-4:50, **moved to Locy Hall 301**

TA Martha Eichlersmith (MarthaEichlersmith2023@u.northwestern.edu)
TA Wei Ju (WeiJu2021@u.northwestern.edu)
TA Tim Lau (tszkitlau2023@u.northwestern.edu)

TA office hours and locations will be posted on Canvas.

LEARNING OUTCOMES
In this class, students will: Increase their knowledge of both descriptive and inferential statistics. Understand and apply probability theory. Construct confidence intervals and conduct hypothesis tests.

COURSE WEBSITE
This course has a website on Canvas. Everyone should automatically be enrolled in the Canvas website upon official enrollment in the class. I will post my lecture notes on the website by 5:00 pm the day before class. You should print out the materials and bring them to class. Problem sets, problem set solutions, and other materials will also be posted on the website. I will post announcements on the website stating what you should print out for class and when assignments are due.

COURSE MATERIALS
The textbook for the course is *Statistics for Business and Economics* (Eighth Edition) by Paul Newbold, William L. Carlson, and Betty M. Thorne. We are using *Statistics for Business and Economics*: *Second Custom Edition for Northwestern University*, which includes just the first 11 chapters from the eighth edition. The ISBN-13 is 978-1-256-86179-9. You will also need a calculator for this class. You can use any type of calculator. Bring your calculator to every class.

SECTIONS
Each week, I will post section problems on Canvas. You will print out the section problems and bring them with you to section. You don't have to solve the problems ahead of time. The TAs will work through the solutions. The section problems will be similar to problems that you will encounter on the problem sets and exams.

CANVAS PROBLEM SETS

Almost every week, I will post at least one problem set on Canvas. You will need to submit numerical answers or answer multiple choice questions on Canvas. Canvas will automatically grade the problem sets. If you miss the deadline for submitting your answers, you will not receive credit for that problem set. For questions about how to complete the Canvas problem sets, read the policy_canvas_psets handout on Canvas (under Policies folder).

OFFICE HOURS

Most weeks, I will post two problem sets on Canvas- version *a* and version *b*. During office hours, you can ask us questions about version *a*, but you need to complete version *b* on your own. Make sure you attempt version *a* before you come to office hours. Bring your work with you to office hours so that we can look over your work to help determine where you might have made a mistake. Do not come to office hours with a blank problem set sheet.

QUIZZES

We will give quizzes during lecture this term. The default is that the quizzes will be unannounced. The quizzes will be open-note (not open-phone or open-computer or open-device). Make sure you bring your calculator and all the tables we post to class every class. You cannot borrow or share a calculator. The tables will not be provided.

EVALUATION

Grades are based on the following distribution:

Problem Sets and Quizzes together	15%
Exam #1	20%
Exam #2	25%
Final Exam (cumulative)	40%

We will drop your lowest version *a* problem set score. We will drop your lowest version *b* problem set score. We will drop your lowest quiz score. At the end of the term, we will do this calculation:

[(your PS points + your quiz points)/(total PS points + total quiz points)]×100%

This percentage score will constitute 15% of your final grade.

None of your exam scores will be dropped. You cannot use a formula sheet on any of the exams.

EXAM DATES

Exam #1 will be given in class on Friday, October 25.
Exam #2 will be given in class on Friday, November 22.
The Final Exam will be given on Friday, December 13 from 9:00 AM – 11:00 AM.

You must take the Final Exam in our classroom on the date and time specified above.

EXCUSED ABSENCES

If you miss an exam (or quiz) for an excused reason, such as illness, a family emergency, or travel with a University sports team, then you need to fill out the excused absence form on Canvas, staple your documentation to the back of the excused absence form, and hand everything in to me during the next lecture after the exam. If you are feeling unwell, you should report in person to the Student Health Service or CAPS prior to the time of the exam. In the absence of documentation, an absence will be considered unexcused. If you miss an exam or quiz for an unexcused reason, you will receive a 0 on that assessment. Missing class for a job interview, a job-related activity, an internship interview, an internship-related activity, any activity related to another class, or a family event would not constitute an excused absence.

<u>If you take an exam, or start to take an exam, can you receive an excused absence for that exam?</u>
No. If you take an exam, or start to take an exam, you cannot receive an excused absence for that assessment. Your exam score will count and it will be used to determine your final grade in the class. If you feel that you are too unwell to take the exam, do not take the exam. Instead, you should report in person to the Student Health Service or CAPS prior to the time of the exam.

MAKEUP POLICIES

Canvas Problem Sets
Since you do not have to be physically present in the classroom to submit your answers to the Canvas problem sets, there are no makeup Canvas problem sets. If you miss the deadline for submitting your answers, you will not receive credit for that problem set.

Quizzes
We are going to drop your lowest quiz score. If you only miss one quiz and you miss that quiz because of an excused reason, that score will just be dropped. If you only miss two quizzes and you miss both quizzes for excused reasons, your first missing score will be dropped and your second missing score will be replaced with your Final Exam score. If you only miss two quizzes, and you miss one quiz for an excused reason and one quiz for an unexcused reason, your score from your excused absence will be dropped and your score of 0 from your unexcused absence will be counted.

Exams

If you miss Exam #1 or Exam #2 for an excused reason, you will not take a makeup. All of the weight from the missed exam will be added to the Final Exam.

If you miss both Exam #1 and Exam #2 for excused reasons, then your final grade will be determined by whichever calculation is lower (method *a* or method *b*):

a) 100%×(Problem Sets and Quizzes together)
b) 100%×Final Exam

To qualify for an Incomplete if you do not take the Final Exam:

1) Your absence from the Final Exam has to be for an excused reason.
2) You have to have either taken Exam #1 and Exam #2, taken Exam #1 and missed Exam #2 for an excused reason, or taken Exam #2 and missed Exam #1 for an excused reason. (If you miss both Exam #1 (for any reason) and Exam #2 (for any reason), you would not qualify for an Incomplete.)
3) Your course grade going into the Final Exam has to be at least 60%.

If you do not take the Final Exam and do not qualify for an Incomplete, then your score of 0 on the Final Exam will be counted.

If you do not take the Final Exam and receive an Incomplete, then your final grade will be determined by whichever calculation is lowest (method *a*, method *b*, or method *c*):

a) 100%×(Problem Sets and Quizzes together)
b) 100%×Makeup Final Exam
c) 15%×(Problem Sets and Quizzes together) + 20%×Exam #1 + 25%×Exam #2 + 40%×Makeup Final Exam

(For method *c*, if you missed either Exam #1 or Exam #2 for an excused reason, then that weight will be added to the Makeup Final Exam.)

GRADING POLICIES
For questions on how to deal with rounding on problem sets and exams, read the policy_rounding handout on Canvas (under Policies folder). If a grading mistake was made on your exam, you need to give me your exam during the lecture following the lecture in which the exams were initially returned. Final grades will be decided on the following scale:

A	93.0-100		C+	77.0-79.99
A-	90.0-92.99		C	73.0-76.99
B+	87.0-89.99		C-	70.0-72.99
B	83.0-86.99		D	60-69.99
B-	80.0-82.99		F	Below 60

CLASSROOM POLICIES

Laptop Computer Policy

Except in the case of proven medical necessity, students may not use a laptop computer or computer tablet during the lectures. Such devices must remain in your bag, and may not be placed on your desk.

Cell Phone Policy

Cell phones should have the ringer turned off and be placed in pockets or backpacks. Students may not make or receive phone calls, surf the web, or send or receive text messages during class.

If you violate a classroom policy and we ask you to leave the classroom and you decline to leave, then you will receive an F in the class for the term.

OPTIONAL MENTORING

Quarter-Long Study Group Opportunity – Registration Required:
If you would like to study with other students in this class, consider joining a Peer-Guided Study Group. Participants will meet weekly with about 5 to 8 other students and a peer facilitator – a student who has already taken and done well in the course. During sessions, students review concepts, work through practice problems, bring their questions, and work together to develop answers. Students register for the full quarter on CAESAR and attendance is expected weekly. Study Groups sessions are listed on CAESAR below course lecture and discussion sections (ex. CHEM 131-SG – CHEM 131-SG Peer-Guided Study Group: Quantitative Problem Solving in Chemistry). Contact Borislava at *borislava.miltcheva@northwestern.edu* with any questions.

Drop-In Peer Tutoring – No Appointment Needed:
Students are welcome to stop by Drop-In Peer Tutoring to get support with a specific question or issue, or just talk through course materials with others. Check specific times, courses and locations: https://www.northwestern.edu/academic-support-learning/course-support/drop-in-peer-tutoring.html. Contact Una at *una.mcgeough@northwestern.edu* with any questions.

NORTHWESTERN POLICIES

Academic Integrity
The Provost's Office maintains information on resources and university principles related to academic integrity; see http://www.northwestern.edu/provost/policies/academic-integrity/.

Disability Accommodations
Any student with a documented disability needing accommodations is requested to speak directly to the AccessibleNU office (http://www.northwestern.edu/accessiblenu/) and the instructor, as early as possible in the quarter (preferably during the first two weeks of classes). All discussions will be confidential.

TOPICS COVERED

Chapter 1- Describing Data: Graphical
bar graphs, histograms, and scatter plots

Chapter 2- Describing Data: Numerical
mean, median, percentiles, quartiles, IQR, outliers, variance, standard deviation, covariance, correlation

Chapter 3- Probability
probability rules, conditional probability, independence, Bayes' Theorem

Chapter 4- Discrete Random Variables and Probability Distributions
expected value and mean of discrete random variable, linear functions of discrete random variables, binomial distribution, covariance and correlation

Chapter 5- Continuous Random Variables and Probability Distributions
uniform distribution, normal distribution, normal approximation for binomial distribution

Chapter 6- Sampling and Sampling Distributions
central limit theorem, sample mean, sample proportion

Chapter 7- Estimation: Single Population
t distribution, confidence interval for population mean (population variance known and unknown), confidence interval for population proportion

Chapter 8- Estimation: Additional Topics
confidence interval for difference between two population means (population variances known and unknown), confidence interval for difference between two population proportions

Chapter 9- Hypothesis Testing: Single Population
significance test for population mean (population variance known and unknown), significance test for population proportion

Chapter 10- Hypothesis Testing: Additional Topics
significance test for difference between two population means (population variances known and unknown), significance test for difference between two population proportions

Regression
OLS coefficient estimators, R^2, total sum of squares (TSS), explained sum of squares (ESS), sum of squared residuals (SSR)