**EDP 308: Statistical Literacy and Reasoning**
**Fall 2017 MW 12:30-1:45 SZB 296**

**Instructor:**
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**Office:**
SZB 538 (Common Area)
MW 2-3:30 & By Appointment

## Course Description

This course is designed to introduce you to statistical applications and their interpretation in daily life. In this course, you will learn the principles of gathering and analyzing data, as well as interpreting analysis results in order to critically evaluate findings reported in the media and in social science research. This course will provide you with the tools to perform basic statistical analyses and to be informed consumers of research.

## Quantitative Reasoning Flag

This course carries the Quantitative Reasoning flag. Quantitative Reasoning courses are designed to equip you with skills that are necessary for understanding the types of quantitative arguments you will regularly encounter in your adult and professional life. You should therefore expect a substantial portion of your grade to come from your use of quantitative skills to analyze real-world problems.

## Prerequisites

Mathematical skills***:*** While this course is not completely mathematical, it is founded upon the use of mathematical tools. Thus, some fundamental mathematical skills are essential for successful mastery of the material. Students are expected to have basic algebra skills including the ability to solve single variable equations. Students should have a basic understanding of exponents and square roots, as well as the order of operations, proportions, fractions, decimals, percentage, and negative numbers.

## Course Materials and Resources

***Required Text:*** *Statistics: The Art and Science of Learning from Data (4th Edition) by* A. Agresti, C. Franklin, and B. Klingenberg. Optional homework problems are available in this book. The text is also helpful because it provides more detailed information than can be presented during class time.

***Required Resource***: *MathXL 6-Month Student Access Kit*. Graded homework assignment questions will be generated and assessed via this access kit, which you are required to purchase. You can purchase a 6-month student access kit for $60.50. To do this, go to: www.mathXL.com. This access kit will also allow you to take practice tests and receive individualized study plans, access supplemental learning information (e.g., video clips), and copy data to import into Excel.

***Calculator:*** Students are required to bring to class a scientific calculator that can be used to sum, multiply, take the square root and square of numbers. Calculators are recommended for use with homework and tests as well as during class time. During in-class exams, you must use a calculator that does not have the capacity to connect to email (use of cell phones is completely

**forbidden** during exams).

***Optional Resource:*** A set of class notes will be available on Canvas at **http://canvas.utexas.edu/.** Reading the notes does not provide you with the learning experiences/material equivalent to that obtained by attending class. The notes provide an outline of what is being covered each day and will thus be an incomplete version of the material actually covered. The notes contain spaces for you to fill in additional material provided and practice calculations presented in class.

**Assignments - *UNGRADED***

***Homework:*** Reading about statistics does not ensure mastery. As with many other skills, the best way to master statistics is through practice. There will be homework problems associated with each class topic (see the List of Topics). Once a topic has been covered in class, the homework should be completed. The ungraded homework assignments are even-numbered problems from the Chapter problems in the textbook. Because answers to odd-numbered problems are available at the back of the text, you are also encouraged to try odd-numbered problems on your own. The answers to each homework assignment will be made available on Canvas. It is your responsibility to check your work and ensure your mastery of the relevant material. Please come to office hours if you have any questions.

***Review Quizzes Online***

The quizzes are ungraded. The quizzes are designed to review material covered in class while offering you the opportunity to test your mastery of course concepts and try out additional computational exercises. The quizzes also expose you to some of the kinds of questions you that will be on the exams. These will be made available on MathXL prior to exam dates.

**Assignments - *GRADED***

***Homework:*** There will be 8 graded homework assignments. Homework assignments will involve one or more of the following components: computation of statistical procedures, interpretation of analysis results, and a critical evaluation of findings reported in different contexts. Excel will be used to support hand calculations for the homework assignments that involve computation. These homework assignments will require that you use the MathXL access kit. Homework assignments are weighted equally and worth a total of ***40%*** of your final grade.

***Exams:*** There will be three exams. The exams will focus on the material covered during the most recent class segment. These exams provide you with an incentive to synthesize the material being covered and an opportunity to demonstrate mastery of the skills being learned. More detail will be provided about the material assessed by each exam as exam time approaches. Note that most of the statistical skills acquired during this class build upon previous learning. This means that even though each exam focuses on the preceding section of the course, you may need to recall skills learned in earlier sections. Exams will consist of true-false, multiple-choice, and short-answer questions including both conceptual and computational problems. You will be given one class period to complete the exam. You will also be given a formula sheet and necessary tables for each exam. You should also bring a calculator to the exam. Exams are weighted equally and worth a total of ***60%*** of your final grade.

**Makeups and Late Homework**

Only in exceptional circumstances (which does ***NOT*** include family vacations, weddings, routine doctor's appointments, job interviews, etc.) and only with **prior** permission from the instructor, or with a verifiable medical excuse, will you be able to take a makeup exam or turn in a graded homework assignment late without penalty. You must provide medical proof of illness. You are also responsible for notifying the instructor by the day of the exam or by the day in which a graded homework is due. Unexcused late homework will result in a 5% deduction of points for each weekday that the assignment is late.

**Grading system**

Your homework assignments and exams will be averaged according to the percentages (weights) shown below. Grades will be posted to our Canvas website – please periodically check for any keypunch errors. Final grades will then be assigned based on the scale below:

| *Assessment* | *Weight* |
|---|---|
| Total homework points converted to a percentage | 40% |
| Total exam points converted to a percentage | 60% |

Grades are assigned based on the percentage of accumulated points:

| *Overall Course Percent* | *Grade* |
|---|---|
| 93% - 100% | A |
| 90% - 92% | A- |
| 86% - 89% | B+ |

| | |
|---|---|
| 83% - 85% | B |
| 80% - 82% | B- |
| 76% - 79% | C+ |
| 73% - 75% | C |
| 70% - 72% | C- |
| 66% - 69% | D+ |
| 63% - 65% | D |
| 60% - 62% | D- |
| Below 60% | F |

**Attendance policy**

You are responsible for all material presented in lectures. Further, you are expected to attend lectures although attendance will not be taken. The class is designed this way because practice obtained during class time provides one of the best opportunities for learning. Exams are held during class time and can only be re-scheduled for individual students under exceptional circumstances (see Makeups and Late Homework for details).

You are expected to arrive ***on time*** for the beginning of class. Students anticipating late arrival should notify the instructor before class. A pattern of tardiness can ***negatively affect*** your grade. You are also expected to remain in the classroom for the duration of the lecture. Students needing to leave prior to the end of the scheduled meeting time should inform the instructor before the lecture begins. Cell phones ***must*** have the sound turned off when in the classroom and are not allowed to be visible during exams or lecture.

Religious holy days sometimes conflict with class and examination schedules. It is the policy of The University of Texas at Austin that you must notify each of your instructors prior to the classes scheduled on dates you will be absent to observe a religious holy day. If you have to miss an exam due to a religious holy day, it is your responsibility to re-schedule with the professor another time to take the exam.

**Disability Accommodation**

Students with disabilities who require special accommodations need to get an accommodation letter that documents the disability from the Services for Students with Disabilities (471-6259 voice or 471-4641 TTY for users who are deaf or hard of hearing). This letter should be presented to the instructor in each course at the beginning of the semester and accommodations needed should be discussed at that time. Five business days before an exam, the student should remind the instructor of any testing accommodations that will be needed. See the following website for more information: http://ddce.utexas.edu/disability/.

**Scholastic dishonesty policy**

The University defines academic dishonesty as cheating, plagiarism, unauthorized collaboration, falsifying academic records, and any act designed to avoid participating honestly in the learning process. Scholastic dishonesty also includes, but is not limited to, providing false or misleading information to receive a postponement or an extension on a test or other class assignment, and

submission of essentially the same written assignment for two courses without the prior permission of faculty members.

By accepting this syllabus and participating in this course, you have agreed to these guidelines and ***must*** adhere to them. This means (specifically for this class) that any work that you hand in for a grade ***MUST*** be your own work. This also means that you may ***NOT*** use or review the exams of students of this class from previous semesters.

Violation of this agreement and of any of the University rules on scholastic dishonesty will result in the student being awarded an ***F for the final course grade***, being referred to the appropriate university officials, and may result in suspension or expulsion from the University. For more information on scholastic dishonesty, students may review the Student Judicial Services web-site: http://deanofstudents.utexas.edu/sjs/.

**Communication**

In this course, ***e-mail*** will be used as a means of communication. You will be responsible for checking your e-mail regularly for class work, deadlines, changes, and announcements. I check my email several times each weekday (on weekdays between 9am and 5pm).

You will also be responsible for checking the Canvas course site regularly for class work, announcements, and copies of the lecture slides. As with all computer systems, there are occasional scheduled downtimes as well as unanticipated disruptions. Notification of these disruptions will be posted on the Canvas login page. Canvas is available at http://canvas.utexas.edu/. Support is provided by the ITS Help Desk at 475-9400 Monday through Friday 8 am to 6 pm, so plan accordingly.

**Hints for success**

***Practice I:*** Practice will facilitate successful mastery of the skills to be learned from this class. During class periods, guided practice will be offered in the form of sample problems. The homework and review question assignments will also provide opportunities for practice.

***Practice II***: Watching the instructor work through examples may (hopefully) make problems appear simple. However, I will not be at your side when you are working problems out in the real world (or, say) on exams. I strongly recommend that you practice the computations we do in class.

***Practice III***: You know the topic you are covering when doing a homework assignment or listening to me work through an example in class. In the real world (or on an exam), you will not have these contextual clues (such as chapter headings!). Make sure you understand when to use the statistics we cover, not just how to do so.

***Homework I***: The homework problems provide you with some computational practice. However, I expect you to grasp more than just the steps required to solve problems. I recommend that you also focus on mastering the concepts covered during class time, including the interpretation of the results and how to critically evaluate these results if presented differently.

***Homework II***: By the same token, while some of the homework problems appear to entail purely computational practice, some of them are trying to demonstrate statistical concepts (such as comparing factors that might impact statistical conclusions) using numbers. Instead of whipping through the computations, take time to think through why the questions, for example, may ask you to compare outcomes. What factor is being manipulated and what is the impact of the manipulation? This will help you to become a more informed consumer of research.

***Textbook***: You are responsible for whatever topics are covered in class. I do not necessarily cover all the material in the textbook. The terminology in the textbook sometimes differs from what is used in class. Use the terminology I use in class.

***Study groups:*** It is highly recommended that you form study groups to master the material in this class. If you understand a concept, teaching it to your fellow students will help you solidify that learning. If you do not understand a concept, it might help to have it presented to you by someone who has more recently mastered it than the instructor. It can help to have a concept presented by several people in different ways.

***Office hours:*** Use them – my job is to help you learn! If you cannot make it to office hours, ask about scheduling another time to meet.

***Email I***: Check your email messages from me.

***Email II***: Use email to schedule appointments ***NOT*** to ask conceptual or computational questions. I will not answer those questions online because hand-feeding you the answer(s) does not help you to learn as much as me prompting **you** (face-to-face) to come up with the answer.

***Class notes:*** If you miss class, it is your responsibility to obtain any missed information from a classmate – ***not*** from the instructor.

***Keep up:*** The skills to be mastered for statistical analyses keep building upon themselves. If you fall behind, it will not only affect the topic in which you are behind but will affect your learning of a later topic.

## Tentative Schedule

The topics to be covered are listed below as are the readings you are expected to do, whether or not the material is explicitly addressed in class. Topics are subject to change if we do not move as quickly as anticipated. Exam dates will not change, but homework assignment due dates will depend upon how quickly we get through the relevant material.

| Week | Topic | Reading | Exam/ Graded HW |
|---|---|---|---|
| 1 | Course Introduction; Learning from Data | Ch. 1 | |
| 2 | Descriptive Statistics; Exploring Data | Ch. 2 | |
| 3 | Descriptive Statistics cont'd; Association Between Variables | Ch. 2<br>Ch. 3 | |
| 4 | Gathering Data; Probability | Ch. 4<br>Ch. 5 | HW1 |
| 5 | Probability cont'd; Probability Distributions | Ch. 5<br>Ch. 6 | HW2 |
| 6 | M: Exam 1 Review<br>**W: Exam 1** | | HW3<br>Exam 1 |
| 7 | Sampling distribution; Introduction to Inference: Point and Interval Estimates | Ch. 7<br>Ch. 8 | |
| 8 | Significance Tests | Ch. 9 | HW4 |
| 9 | Comparing Groups: *t* tests | Ch. 10 | HW5 |
| 10 | Comparing Groups: ANOVA | Ch. 14 | HW6 |
| 11 | M: Exam 2 Review<br>**W: Exam 2** | | Exam 2 |
| 12 | Associations Between Categorical Variables | Ch. 11 | |
| 13 | Correlation | Ch. 12 | HW7 |
| 14 | Regression | Ch. 12 | HW8 |
| 15 | M: Exam 3 Review<br>**W: Exam 3** | | Exam 3 |