Introduction to Statistics - Syllabus

Spring 2016

EDP 371

Course Instructor: Martin Tombari

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Office: SZB 538B

Office Hours: W 1-3 or by appointment

<u>Sections:</u>

Spring   2016 -Unique Number: 10600   T-Th: 9:30 - 11;00   SZB 324

Spring   2016 -Unique Number: 10605   T-Th: 12;30 - 2:00   UTC1.146

Spring   2016 –Unique Number: 10610   T-Th: 2:00 - 3:30   UTC 1.146

Spring   2016 -Unique Number: 10615   Web

<u>Teaching Assistants:</u>

Name:

Office:

Office Hours:

Email:

Name:

Office:

Office Hours:

Email:

Name:

Office:

Office Hours:

Email

Name:

Office:

Office Hours:

Email

Course Description:

This course is designed to help students learn the introductory descriptive and inferential statistical procedures that are used in behavioral and social science research studies. Students will acquire statistical literacy, become skilled at graphic production, learn the basics of making inferences from samples to populations, and recognize the statistics used with different types of data. These skills will provide the student with a basis to conduct their own such analyses and to evaluate critically others' uses of statistics.

Quantitative Reasoning:

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 tests to assess 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.

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 class assignments 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).

Course Materials and Resources:

Required: The title of the class text is: *"Stat Sense: Thinking Clearly About Data".* The author of this text is Martin Tombari. This packet contains the course objectives that you will be tested over, sample test questions for all exams, homework

problems and answers, tables needed to solve test problems, necessary formulae and vocabulary, problems to solve in class, places to take class notes, graph and chart paper to sketch problems, suggested web sites for better understanding and extended practice, links to You Tube videos, and many illustrations. The publisher of this text is Sentia Publishing. You may order the text directly from Sentia at:

 http://www.sentiapublishing.com/search.php?Search=&search_query=tombari

or purchase it at the COOP. If you order the text from Sentia I recommend you get the hard and not the electronic copy. ***We will use this book in every class.***

Also Required: There is a workbook titled " *EDP371 - Spring 2016 Workbook*" that must be brought to class everyday along with the text. ***This workbook can only be purchased at the COOP.*** It contains practice exercises that will be done in class, collected during class, and graded. If you do not have this workbook, you will not be able to take these class quizzes. There will be no copies of this material passed out in class.

Please bring the textbook and workbook with you to the first class.

Optional: The optional class text is: "Statistics for the Behavioral Sciences" by Frederick J Gravetter and Larry B Wallnau. This textbook is available at the Co-op and other on-line outlets. It is an excellent text with many interesting problems to solve for your deeper learning. It also presents the material in a slightly different way than the instructor presents the material during class time.

Also, optional, is "Introduction to Statistics: Online Edition" by David M. Lane which we will post on Canvas for you to download. The course packet will recommend specific pages to read in this online text that reinforce packet material.

Course Requirements:

1. Exams

There will be **4 exams** during the fall semester. The exams, except the final exam, will focus on the material covered during the most recent class segment. The first three exams each will contain 30 multiple choice questions and be worth a total of 90 points. The 4th exam will be held during finals week, contain 50 multiple-choice questions, and be worth 50 points. The final exam will contain questions from the beginning of the course.

The four exams total to 140 points and count approximately 80% of your class grade.

You must take all exams. If you miss an exam without an excuse (e.g. illness, family mishap), you will receive a grade of zero.

If you are more than 30 minutes late for an exam, you will not be allowed to take it and you will receive a grade of zero...unless you have a valid excuse for

lateness. Transportation problems are not a valid excuse.

2. Classwork

There will be approximately 12 short class assignments (contained in the workbook) to help you practice, learn, and better understand statistical skills. Most of these assignments will be graded. There are no make-ups. If you are absent from class without an excuse you will get a grade of zero. **Classwork counts approximately 20% of your class grade.** You can earn a total of approximately 35 points towards your final grade by completing correctly these assignments.

3. Research Participation

All students registered for this course must complete a research participation requirement through the Educational Psychology Department subject pool. To do so, you must either complete 5 credits worth of EDP subject pool studies or write the 5 page alternate assignment (a research paper about a roughly 20 page article). Please note the deadlines below:

- To participate in studies, you must first activate your SONA account online at **https://utexas-edp.sona-systems.com**. To do this, activation instructions will be emailed to your official email address during the second week.
- Studies will be available beginning on **Wednesday, February 17th**. The sooner you view the studies, the larger selection you will have.
- The alternate written assignment will be posted on **Friday, March 4th**. This is for students who either prefer to not participate in studies or who do not meet the 5 credit requirement by the study completion deadline (below).
- To fulfill this requirement through study participation, <u>you must complete 5 credits of subject pool studies</u> by midnight on **Friday, April 15th**. Otherwise, you must write the alternate assignment.
- Alternate assignments are due by midnight on the last class day, **Friday, May 6th**.

If you have questions about your participation in the EDP subject pool or about the alternate assignment, please visit the following website:
http://www.edb.utexas.edu/education/departments/edp/subject_pool/students/
If you still have questions, please email the Subject Pool Coordinator, Kadie Rackley.
edpSubjectPool@austin.utexas.edu

4. Attendance Policy

Attendance at all classes is required. Attendance will be taken during class on a random basis. *If you are marked absent on 30% or more of the days on which attendance is taken, you will take a cumulative (Units 1-13) essay exam for the final, and the final will count 50% of your course grade.*

<u>How Grades Will Be Assigned:</u>

Grades are assigned based on a percentage of total points that were possible for you

to earn. It is possible to earn approximately 175 points if you get perfect scores on all tests and assignments.

Overall Course Percent	Grade
90% of total points	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
Below 60%	F

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 assignments, 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://www.utexas.edu/depts/dos/sjs/.

Disability Accommodation

Students with disabilities who require special accommodations need to get a letter that documents the disability from the Services for Students with Disabilities area of the Office of the Dean of Students (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://deanofstudents.utexas.edu/ssd/providing.php

 (Links to an external site.)

Communication

In this course *e-mail* will be used as a means of communication with students. You will be responsible for checking your e-mail regularly for class work, deadlines, changes and announcements.

You will also be responsible for checking the Canvas course site regularly for class work, announcements, and copies of the lecture notes. As with all computer systems, there are occasionally scheduled downtimes as well as unanticipated disruptions. Notification of these disruptions will be posted on Canvas. 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: 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 exercise assignments will also provide opportunities for practice. It is hoped that studying for and completion of exams will provide additional such opportunities.

Office hours: Use them – our job is to help you learn! If you cannot make our office hours, ask us after class or via email to schedule another time to meet with the TA or me.

Email I: Check your email messages from the TAs and me.

Email II: Use email to schedule appointments *NOT* to ask conceptual or computational questions.

Class notes: If a student misses class, it is his/her responsibility to obtain any missed information from a classmate – *not* from the instructor, *nor* from the TA.

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.

Schedule of Topics/Readings/Exams :

Date:	Topic	Reading

Tu 1/19	Introduction: • What is the aim of statistics? • What are important questions and goals that statistics speaks to? • Where do we get information about these questions? • How do we know if the information is any good? • Let's start speaking the same language.	Unit 1 in Course Packet
Thu 1/21	Measurement Levels, Variables, Parameters, Statistics	Unit 1
Tu 1/26	Describing Data: Tables and Charts • Interpreting Data Tables • Charts and Rules • Interpreting Charts ◦ Truth In Charts	Unit 2
Thu 1/28	Tables and Charts (cont'd)	Unit 2
Tu 2/2	Describing Data: Averages • Mean • Weighted Mean • Median • Mode • So where is the middle?	Unit 3
Thu 2/4	Averages (cont'd)	Unit 3
Tu 2/9	Variability • Range • Variance • Standard Deviation • Interquartile Rang Choosing the right statistic	Unit 4
Thu 2/11	Variability	Units4
Tu 2/16	**Exam 1**	Units1-4

Thu 2/18	z-Scores
	
	   Standardization
	   Percentile Scores
		Unit 5

Tu 2/23	The Standard Normal Distribution • Simple probability • Computing Probabilities for z-Scores	Unit 6
Thu 2/25	The Central Limit Theorem • Sampling Procedures • The Distribution of Sample Means • The Standard Error of the Mean • Sample Probabilities	Unit 7
Tu 3/1	The Central Limit Theorem (cont'd) • Sampling Procedures • Sampling error and the standard error	Unit 7
Thu 3/3	Confidence Intervals • Point Estimates of Parameters • Confidence Intervals using z Confidence Intervals using t	Unit 8
Tu 3/8	Confidence Intervals (cont'd)	Unit 8
Thu 3/10	**Exam 2**	Units 5-8
Tu 3/22	Hypothesis Testing • Null and Alternative Hypotheses • One and Two Tail Tests • Type I and Type II Errors • Hypothesis Tests using the z statistic	Unit 9
Thu 3/24	Hypothesis Testing Inferences About Averages of One Sample	Unit 9
Tu 3/29	• Inferences Involving Averages from One Sample	Unit 10

Thu 3/31	• Inferences About Averages from Two Samples	Unit 10
Tu 4/5	• Inferences Involving Averages • Inferences About Averages From Two Samples	Unit 10
Thu 4/7	• Inferences About Averages From More Than Two Samples	Unit 10
Tu 4/12	Exam 3	Unit 9 & 10
Thu 4/14	Correlation	Unit 11
Tu 4/19	Correlation • Pearson • Scale • Interpretation • What affects magnitude?	Unit 11

Thu 4/21	Regression
	
	  Least Squares
	  Slope
	  Y intercept
	  Coefficient of Determination
		Unit 11

Tu 4/26	Inferences about Associations • Goodness of Fit	Unit 12
Thu 4/28	Inferences About Associations: • Contingency Analysis	Unit 12
Tu 5/3	Inferences About Proportions • Polling	Unit 13
Tu 5/5	Inferences About Proportions • Profiling	Unit 13

Final Exam	See Final Exam Schedule Published by the Registrar	Units 1-13