

**EDP 371 – Introduction to Statistics****Summer (f) 2012 -Unique Number: 74920 TWTh: 11:00 - 2:30 UTC 1.144****Summer (s)-2012–Unique Number: 75195 TWTh: 11:00 - 2:30 UTC 4.132****Instructor****Name:** Dr. Martin Tombari**Office:** SZB 538K**Office Hours:** By appointment.**Email:** [mtombari@austin.utexas.edu](mailto:mtombari@austin.utexas.edu)**Teaching Assistant****Name:** Matt Clem**Office:** SZB 506N**Office Hours:** Thursday 9:00 – 11:00**Email:** [maclem@utexas.edu](mailto:maclem@utexas.edu)**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 learn the assumptions underlying, the hypotheses being tested by, and the inferences that can be made with the use of the procedures. 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 your grade to come from your use of quantitative skills to analyze real-world problems.

**Pre-requisites**

**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. Pages in Appendix A of the textbook contain a review of the basic math skills needed for this course.

**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:** *Integrative Statistics for the Social and Behavioral Sciences: Ha & Ha; Sage 2012.* This textbook is available at the Co-op. It also provides a good resource in that it presents the material in a slightly different way than the instructor presents the material during class time.

**Optional:** Class notes discussed in class will be available on Blackboard

**Final Grades**

Final grades will be based on 3 exams and classroom quizzes. Each exam will be worth 100 points and the classroom quizzes will total 50 points. Your grades will be determined by the percentage of points that you earn out of 350 according to the following criteria:

<i>Overall Course Percent</i>	<i>Grade</i>
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

**Exams**

There will be three exams. The exams will focus on the material covered during the most recent class segment. These exams provide students with an incentive to synthesize the material being covered and an opportunity to practice the skills being learned. More detail will be provided about the material assessed by each exam closer in time to the actual exams. It should be noted that most of the statistical skills acquired during this class are constantly building upon earlier learning. This means that even though each exam will focus on the preceding section of the course, students might need to recall skills learned in earlier sections!

**Format:** Exams will consist of short-answer questions and problem solving including both conceptual and computational problems. Students will be given one/half class period to complete the exam.

**Materials:** Students will be given a formula sheet and necessary tables for each exam. Students should bring a calculator.

**In-class Quizzes:** These quizzes will be given on a random basis during class and will cover skills learned during the class in which the quiz is given. The quizzes will total 50 points and be worth

approximately 15% of your grade. If you are absent from class on the day a quiz is given you will receive a score of zero.

### **Makeups**

Each student will have the opportunity to re-take Exam 1 or 2 with no penalty. Also students who miss an exam will be able to re-take that exam that they missed during the make-up period...but no other make-up exam. All make-ups will be taken on the last class day.

The only exception to the above make-up policy will be for those students who miss class without a valid excuse (a doctor's note). Students who miss class will not be allowed to take make up exams unless the reason for an absence is illness or some other validated emergency on the day of the exam.

### **Attendance Policy**

Attendance at all classes is required. Attendance will be taken on a random basis and those students who are not in class on any one of those occasions will lose the opportunity to take a make-up exam.

### **Homework**

The table of course topics (see below) contains problems from the textbook for you to solve. Solving these problems is optional. They are not graded. The teaching assistant or I will promptly correct them. They are an opportunity for you to check how well you have learned important skills that will be evaluated on the three class exams. Also, periodically throughout the class I will post problems on blackboard similar to those we have done in class. You may do these problems on your own and send your solutions to us for feedback.

### **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 website: <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>

**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 Blackboard course site regularly for class work, announcements, and copies of the lecture notes. As with all computer systems, there are occasional scheduled downtimes as well as unanticipated disruptions. Notification of these disruptions will be posted on the Blackboard login page. Blackboard is available at <http://courses.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:*** 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. It is hoped that studying for and completion of exams will provide additional such opportunities.

***Textbook:*** You are responsible for whatever topics are covered in class. We do not necessarily cover all the material in the textbook. The terminology in the textbook sometimes differs from what we use 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 TA or instructor. It can help to have a concept presented by several people in different ways.

***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 TA and me.

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

***Email III:*** (and most important) If you email one of us (professor or TA), please copy ***both*** of us on the email. That ensures a speedier response.

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***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.

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**Introduction to Statistics, Summer 2012**  
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**Tentative Schedule of Topics**

Date	Topics	Activities
5/31	<ol style="list-style-type: none"><li>1. Introduction<ol style="list-style-type: none"><li>a. Course mechanics</li></ol></li><li>2. Samples and populations<ol style="list-style-type: none"><li>a. Basic terminology</li></ol></li><li>3. Key elements of a statistical problem</li><li>4. Describing qualitative data<ol style="list-style-type: none"><li>a. Scales</li><li>b. Charts</li></ol></li><li>5. Describing quantitative data<ol style="list-style-type: none"><li>a. Scales</li><li>b. Charts</li></ol></li><li>6. Statistical notation</li><li>7. Math skills test</li></ol>	<p>-Read Chapters 1-3</p> <p>-Do the following problems: 2.9, 2.10, 2.19-2.25, 3.15 – 3.22</p>
6/5	<ol style="list-style-type: none"><li>1. Measures of central tendency<ol style="list-style-type: none"><li>a. Mean, median, mode</li><li>b. Choosing which measure to report</li></ol></li><li>2. Measures of variability<ol style="list-style-type: none"><li>a. Range</li><li>b. Standard deviation</li><li>c. Variance</li><li>d. Sums of squares</li></ol></li><li>3. Measures of relative position<ol style="list-style-type: none"><li>a. Percentiles</li><li>b. Interquartile range<ol style="list-style-type: none"><li>i. Boxplots</li></ol></li></ol></li><li>4. Choosing which measure of variability to report</li><li>5. Constants and measures of central tendency and variability</li><li>6. Distorting the truth with descriptive statistics</li></ol>	<p>-Read Chapter 4</p> <p>-Do the following problems: 4.11 – 4.23.</p>
6/6	<ol style="list-style-type: none"><li>1. Probability<ol style="list-style-type: none"><li>a. Vocabulary of probability</li></ol></li></ol>	<p>-Read Chapter 5</p> <p>-Do problems: 5.9-5.19.</p>

	<ul style="list-style-type: none"> <li>b. Some rules of probability</li> <li>c. Assigning probabilities</li> </ul> <ul style="list-style-type: none"> <li>2. The normal curve               <ul style="list-style-type: none"> <li>a. Sample space and the normal curve</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>3. Standardized scores               <ul style="list-style-type: none"> <li>a. Calculating z scores</li> <li>b. Transforming scores</li> <li>c. Finding the probability of a z score                   <ul style="list-style-type: none"> <li>i. From z score to normal curve</li> <li>ii. From normal curve to z score</li> </ul> </li> </ul> </li> </ul>	
6/7	<ul style="list-style-type: none"> <li>1. Sampling distributions               <ul style="list-style-type: none"> <li>a. Sampling distributions for discrete variables</li> <li>b. Sampling distributions for continuous variables                   <ul style="list-style-type: none"> <li>i. The sampling distribution of the mean</li> <li>ii. Inferences that require the sampling distribution of the mean</li> </ul> </li> </ul> </li> <li>2. Review for Exam 1</li> </ul>	-Read Chapters 6, 7 - Do problems: 6.6 – 6.15; 7.17 – 7.27;
6/12	<ul style="list-style-type: none"> <li><b>1. Exam 1 (first half of class)</b></li> <li>2. Sampling distributions</li> <li>3. Random sampling</li> <li>4. Estimating population parameters from a sample</li> <li>5. Hypothesis tests of population parameters using sample statistics.</li> </ul>	
6/13	<ul style="list-style-type: none"> <li>1. Making inferences about a population mean based on single samples               <ul style="list-style-type: none"> <li>a. Large sample confidence intervals for a population mean (z statistic)</li> <li>b. Small sample confidence intervals for a population mean (Student's t-statistic)</li> <li>c. Large sample hypothesis tests about a population mean (z statistic)</li> <li>d. Small sample hypothesis tests about a population mean (Student's t-statistic)</li> <li>e. Type 1 and Type 2 errors</li> <li>f. Power and hypothesis testing</li> </ul> </li> </ul>	- Read Chapter 8 - Do problems: 8.12; 8.16-8.20; 8.21-8.25
6/14	1) Making inferences about population means based on two small	- Read Chapter 9

	<p>samples</p> <ul style="list-style-type: none"> <li>a) Comparing two independent samples <ul style="list-style-type: none"> <li>i) Confidence interval for the difference between two population means (Student's t-statistic)</li> <li>ii) Hypothesis tests of the difference between two population means</li> <li>iii) Power</li> </ul> </li> <li>b) Comparing two dependent samples <ul style="list-style-type: none"> <li>i) Confidence for the difference</li> <li>ii) Hypothesis test of the difference</li> <li>iii) Power</li> </ul> </li> </ul>	- Do problems posted on Blackboard
6/19	<ul style="list-style-type: none"> <li>1) Correlation and regression <ul style="list-style-type: none"> <li>a) Associations</li> <li>b) The Pearson correlation coefficient <ul style="list-style-type: none"> <li>i) Interpreting Pearson's r</li> <li>ii) Calculating Pearson's r</li> <li>iii) Coefficient of determination</li> <li>iv) Linear relationships</li> </ul> </li> </ul> </li> <li>2) Regression <ul style="list-style-type: none"> <li>a) Purpose</li> <li>b) Solving the regression equation</li> <li>c) Making predictions <ul style="list-style-type: none"> <li>i) Errors in predicting using regression</li> </ul> </li> </ul> </li> </ul>	<p>-Read Chapter 12</p> <p>-Do problems posted on Blackboard</p>
6/20	<ul style="list-style-type: none"> <li>1) Using qualitative data to make population inferences <ul style="list-style-type: none"> <li>a) Discrete variables</li> <li>b) The binomial sampling distribution</li> <li>c) Examples from current events</li> <li>d) Random sampling revisited</li> </ul> </li> <li>2) Review for Exam 2</li> </ul>	
6/21	<ul style="list-style-type: none"> <li><b>1) Exam 2 (first half of class)</b></li> <li>2) Making inferences about a single population proportion <ul style="list-style-type: none"> <li>a) Large sample confidence intervals of a population proportion (z statistic)</li> </ul> </li> </ul>	
6/26	<ul style="list-style-type: none"> <li>1) Making inferences about a single population proportion (cont'd) <ul style="list-style-type: none"> <li>a) Large sample test of a population proportion (z statistic)</li> </ul> </li> </ul>	Do problems posted on Blackboard

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	<ul style="list-style-type: none"> <li>b) Small sample confidence intervals of a population proportion (Student's t-statistic)</li> <li>c) Small sample tests of a population proportion (Student's t-statistic)</li> <li>d) Power</li> <li>e) The accuracy of opinion polls</li> </ul>	
6/27	<ul style="list-style-type: none"> <li>1) Making inferences about population proportions based on two samples               <ul style="list-style-type: none"> <li>a) Large sample confidence intervals of the difference between two population proportions (z statistic)</li> <li>b) Large sample test of the difference between two population proportions (z statistic)</li> </ul> </li> <li>2) Multinomial tests of proportions (Chi-Square)               <ul style="list-style-type: none"> <li>a) No preference chi-square test</li> <li>b) Goodness of fit chi-square test</li> <li>c) Chi-square test of independence</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Read Chapter 14</li> <li>-Do problems posted on Blackboard</li> </ul>
6/28	<ul style="list-style-type: none"> <li>1) Current events and chi-square</li> <li>2) Correlations with ordinal data               <ul style="list-style-type: none"> <li>a) Spearman's rank order correlation</li> </ul> </li> <li>3) Hypothesis tests with ordinal data               <ul style="list-style-type: none"> <li>a) Wilcoxon Signed Rank Test (T)</li> <li>b) Mann-Whitney U Test (U)</li> </ul> </li> </ul>	Do problems posted on Blackboard.
7/3	<ul style="list-style-type: none"> <li>1) Choosing the right statistic</li> <li>2) Review for Exam 3; Exam 1 &amp; 2 Review</li> </ul>	
7/5	<b>Exam 3; Make –up exams</b>	