Introduction to Statistics
PSYCH 301: Winter Semester 2009
Thomas L. Martin Building (MARB) Room 343
Section 1: MWF 11-12:15

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Course Objective
This is the first course in statistics and as such provides an introductory level coverage of topics such as probability theory, descriptive statistics, sampling distributions, parameter estimation, tests of hypotheses, chi-square tests, and linear regression analysis. The course is intended to provide the student with a fundamental understanding of probability theory and statistics as used in typical applications. Illustrative problems will be presented and discussed.

You may ask yourself "Why do psychology students need to take a course in statistics?" Psychology, in part, is a scientific enterprise and the examination of human thinking processes and behavior requires the application of scientific method and statistical analysis for decisions to be made regarding their causes. Without statistics, the causes of human behavior could not be determined. You may say "I plan on being a therapist, not an experimental psychologist!" Most of the decisions therapists must make about treatment and psychological assessment are based on scientific study. In a more immediate vein, all psychology students are expected to have some knowledge of statistics. The psychology GRE has a significant number of questions concerning this material and graduate programs in psychology and related fields expect students to have good grades in statistics. All psychology graduate programs require students take several statistics courses and state licensing examinations have questions on statistics and research methodology. Outside of psychology, these statistical techniques are used in all sciences, business, marketing, economics, etc. These skills are highly marketable.

BS in Psychology Program Objectives

Graduates will:

(1) Be able to demonstrate more extensive knowledge and deeper understanding of the major core content areas of psychology at a depth that clearly exceeds the undergraduate level.

2) Be able to demonstrate technical sophistication related to their self-selected area of scholarly specialty by using laboratory apparatus, software applications, survey instruments, etc.

(3) Be able to design, produce, analyze, and report original research that contributes to their self-selected area of scholarly specialty.

(4) Be able to weigh evidence, tolerate ambiguity, act ethically, and reflect other values that are the underpinnings of psychology as an academic and professional discipline. In particular, they should be able to critically reflect on these values in light of their knowledge of and commitment to the restored gospel of Jesus

Christ and to sustain personal values that are true to the gospel while maintaining their scholarly study of psychology.

Required Text
Pagano, R.R. (2007). Understanding statistics in the behavioral sciences (8th Ed.). Belmont, CA: Wadsworth.

CD that was bundled with the text – this CD has all the power points and provides a brief narrative for each lecture (about 20 min.). This will be beneficial in your review for quizzes and exams and will be beneficial if you miss a particular lecture.

General Course Design
There are three basic instructional activities: a) course lectures, b) assigned readings, and c) various independent problem sets. The lectures and readings are designed to convey the conceptual and logical foundations associated with developing an understanding of statistics. The problem sets while not explicitly graded, are included to promote students' ability to perform various statistical operations.

There are no formal requirements concerning the attendance at lectures or the completion of readings. The lectures, reading and problem sets are simply the means by which students can prepare themselves for quizzes and examinations. Performance on quizzes and the major examinations will serve as the basis for student evaluation in this course. These are described below in greater detail.

In addition to the problems at the end of each chapter the text also provides a link with review material and practice quizzes.

Textbook Link – for additional problems sets/review materials. (the link is also posted on blackboard).

http://www.wadsworth.com/cgiwadsworth/course_products_wp.pl?fid=M20b&product_isbn_issn=0495096385&discipline_number=24

Student Evaluation
There are two distinct systems for student evaluation in this course. One is based on the assumption that each student should master certain objectives that are regarded as basic knowledge concerning statistics. This system is represented by the course quizzes. The second system is based on the assumption that students will differ with respect to their achievement on more advanced or complex course objectives. This system is represented by the three major examinations.

Minimal Objectives Quizzes

The minimal objective (MO) quizzes are intended to give students frequent feedback concerning their mastery of essential instructional objectives. The questions included on the quizzes are carefully selected to represent only those outcomes that are regarded as basic.

MO quizzes will be given in class on the dates indicated with an asterisk (*) in the course syllabus. Each quiz will consist of 12-15 items. Quiz results will be reported at the following class meeting.

Major Course Examinations

There will be three major course examinations, the first at about five weeks into the term, the second at or about the tenth week of the term and the last exam at the end of the term. The major exams are not comprehensive; however, they do build upon those concepts previously covered. Each exam will be given in the testing center on the dates listed and those chapters listed below in Course Outline.

The major examinations differ from the minimal objectives in one important respect. The major examinations are designed to determine the degree to which students have achieved more advanced course objectives, e.g., ability to interpret or translate concepts and principles given novel situations, the ability to analyze various empirical findings and the appropriateness of their interpretations and/or assumptions, etc. Because the major exams are designed to tap more complex and subtle outcomes, students typically find them more challenging than the minimal objective quizzes.

Grade Assignment
Grades will be based on each student's cumulative score on the quizzes and major examinations.
There are a total of 260 points possible.
Exam 1 = 54 points
Exam 2 = 70 points
Exam 3 = 78 points
Quiz 1 and 2 each worth 14 points
Quiz 3 and 4 each worth 15 points

Grade assignments will be based on the following basis

A = 88% or 229 points
A- = 85% or 221 points
B+ = 82% or 213 points
B = 78% or 203 points
B- = 75% or 195 points
C+ = 72% or 187 points
C = 68% or 177 points
C- = 65% or 169 points
D+ = 62% or 161 points
D = 58% or 151 points
D- = 55% or 143 points

Honor Code Standards
In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact be your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university.

Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university's

expectation, and my own expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at 422-2847 if you have questions about those standards.

Statement on Academic Honesty

While all students sign the honor code, there are still specific skills most students need to master over time in order to correctly cite sources, especially in this new age of the internet; as well as deal with the stress and strain of college life without resorting to cheating. Please know that as your professor I will notice instances of cheating on exams or plagiarizing on papers. See http://www.byu.edu/honorcode for specific examples of intentional, inadvertent plagiarism, and fabrication, falsification.

Statement on Learning Objectives

Each program at BYU has developed a set of expected student learning outcomes. These will help you understand the objectives of the curriculum in the program, including this class. To learn the expected student outcomes for the programs in this department and college go to http://learning outcomes.byu.edu and click on the College of Family, Home and Social Sciences and then this department. We welcome feedback on the expected student learning outcomes. Any comments or suggestions you have can be sent to FHSS@byu.edu.

Statement on Discrimination

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education. Title IX covers discrimination in programs, admissions, activities, and student-to-student sexual harassment. BYU's policy against sexual harassment extends not only to employees of the university but to students as well. If you encounter unlawful sexual harassment or gender based discrimination, please talk to your professor; contact the Equal Employment Office at 378-5895 or 367-5689 (24-hours); or contact the Honor Code Office at 378-2847.

Students with Disabilities

Brigham Young University is committed to providing a working and learning atmosphere which reasonably accommodates qualified persons with disabilities. If you have any disability which may impair your ability to complete this course successfully, please contact the Services for Students with Disabilities Office (378-2767). Reasonable academic accommodations are reviewed for all students who have qualified documented disabilities. Services are coordinated with the student and instructor by the SSD office.

If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek resolution through established grievance policy and procedures. You should contact the Equal Employment Office at 422-5895, D-282 ASB.

Tentative Course Outline

Date	Topic	Reading
1/5	Introduction to course and course objectives	
1/7	Introduction to statistics and the scientific method	Ch. 1
1/9	Scales of measurement	Ch. 2
1/12	Organizing data	Ch. 3
1/14	Graphical representations of data	Ch. 3
1/16	Percentiles and percentile ranks	Ch. 3
*1/19	Measures of central tendency - **Quiz 1**	Ch. 4
1/21	Measures of variability	Ch. 4
1/23	Normal curve	Ch. 5
1/26	Z-scores	Ch. 5
1/28	**EXAM 1 REVIEW (Thur 1/29 – Mon 2/2- Ch 1- 5)**	
1/30	Correlation	Ch. 6
2/2	Factors affecting correlation & Pearson Product Moment	Ch. 6
2/4	Ross out of town – no class	
2/6	Conceptual foundations of regression	Ch. 7
2/9	Regression	Ch. 7
2/11	Regression II	Ch. 7
2/13	Probability	Ch. 8
*2/18	Probability & binomial distribution– **Quiz 2**	Ch. 8 &9
2/20	Binomial distribution	Ch. 9
2/23	Inferential statistics	Ch. 10
2/25	Inferential statistics	Ch. 10
2/27	Hypothesis testing	Ch. 10
3/2	**EXAM 2 REVIEW (Tues 3/3 – Fri 3/6- Ch 6- 10)**	
3/4	Power	Ch. 11
3/6	Calculations of power	Ch. 11
3/9	Power & Error	Ch. 11 & 12
3/11	Sampling distributions	Ch. 12
3/13	Critical values & Power	Ch. 12
3/16	Review of Power	Ch. 12
3/18	Introduction to the t-test	Ch. 13
*3/20	t-tests – **Quiz 3**	Ch. 13
3/23	Ross out of town	
3/25	Student's t-test for independent groups	Ch. 14
3/27	Effect size for the t-test	Ch. 14
3/30	single sample t-test	Ch. 14
4/6	Within group variability	Ch. 14 & 15
4/8	ANOVA & Follow-up comparisons	Ch. 15
*4/10	ANOVA Review - **Quiz 4**	Ch 15
4/13	Chi-square	Ch. 17

Exam 3 – will run during Finals Week in the Testing Center (April 17th – 22nd: Ch's 11-15 & Chi Square)