

Quantitative Methods in the Health Sciences I

Course Syllabus

Fall Semester 2014

Course Description: This applied statistics course was designed to meet the needs of beginning doctoral-level research professionals in the health sciences. The course teaches the analysis of health sciences data using a widely used statistical software package, while developing students' abilities to identify, conduct, organize, and compare appropriate approaches for the analysis and interpretation of health sciences data. This course will focus on the planning and interpretation of health science measurement methods, descriptive statistics, confidence intervals and hypothesis testing, and univariate and bivariate statistics and analyses including t-tests, analysis of variance, multiple comparisons, correlation, and their equivalent non-parametric tests. Oral and written presentation of the testing and interpretation of hypotheses and analyzed data, and synthesis of findings, are required course activities.

Prerequisite: Completed one prior statistics course with grade of B or better that included instruction on descriptive statistics and measures of central tendency, and instructor approval.

Meeting Time: Thursdays 5p-750p

Class Location: HSN 131

Credit Hours: 3 hours

Class Instructor: Dr. Loza

Office Location: HSN 405

Email: oloza@utep.edu

Office Hours: Tuesdays 1030a-1230p and Thursdays 1030a-1230p

Required Textbooks:

Essentials of Biostatistics for Public Health, Second Edition [Paperback]

Authors: Lisa M. Sullivan

Publisher: Jones & Bartlett Learning

Print: (ISBN-10: 1449623948) (ISBN-13: 978-1449623944)

<http://www.jbpub.com/essentialpublichealth/sullivan/2e>

Additional Reference (not required):

Discovering Statistics Using IBM SPSS Statistics, Fourth Edition [Paperback]

Print: (ISBN-10: 1446249182) (ISBN-13: 978-1446249185)

Authors: Andy Field

Publisher: SAGE Publications Ltd

<http://www.uk.sagepub.com/books/Book238032>

The Practice of Statistics in the Life Sciences, Second Edition

Authors: Brigitte Baldi and David S. Moore

Publisher: W. H. Freeman

Print: (ISBN-10 1-4292-7271-6) (ISBN-13 978-14292-7271-1)

eText: (ISBN-10 1429266937)(ISBN-13 9781429266932)

<http://www.whfreeman.com/catalog/Product/practiceofstatisticsinthelifesciences-secondedition-baldi>

Required Software:

- Microsoft Office
- IBM® SPSS® Statistics (alternate: PASW Statistics): data management and statistical analysis software
 - access is available for free to UTEP students under MY.APPS.UTEP.EDU
 - student license available for purchase online

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Additional Resources:

- Technology Support Center (TSC)
 - Workshops: tsc.utep.edu/workshops
 - Report issues to: <https://servicedesk.utep.edu/> or Frank Poblano fpoblano@utep.edu
- Statistical Consulting Laboratory @ UTEP Bell Hall 131 (not for tutoring)
<http://academics.utep.edu/Default.aspx?alias=academics.utep.edu/statlab>

Homework Assignments: Assignments and other selected materials will be available in class or on Blackboard. Late work will receive point reduction: 50% within two days of deadline; no credit if submitted after that.

Teaching/Learning Methods: Course combines in-class lectures and homework exercises. Although students may sometimes work in groups while in the class, please note that all work done outside the class should be completed on an individual basis including homework exercises.

Course Objectives: Upon completion of this course the student will learn the appropriate use of statistical methods for the analysis of data, with continuous and categorical variables, using statistical analysis software IBM® SPSS® Statistics (alternate: PASW Statistics). These objectives should contribute to student's ability to critically review the public health and epidemiologic literature, and to carry out statistical analyses independently for later professional application. Students will be able to:

- 1) identify sources of health sciences related data and statistics.
- 2) demonstrate and practice technical skills needed to view, summarize, and analyze, data using IBM® SPSS® Statistics (alternate: PASW Statistics).
- 3) apply appropriate statistical methods, tests, and terminology for multivariate analyses focusing on linear and logistic regression analyses and diagnostics.
 - a. generate and organize appropriate tables and graphs to summarize results.
 - b. state assumptions for tests performed
 - c. create and present written and oral presentations of their findings.
- 4) discuss use of statistical tools commonly used in health sciences literature, and compare the strengths and limitations of methods used.

Evaluation and Course Grade: Student performance will be evaluated on the basis of:

- Assignments (35%)
- Exams (35%)
- Analysis Project (30%)

Grading Scheme: A ($\geq 90\%$), B (80-89%), C (70-79%), D (60-69%), and F ($< 60\%$)

Analysis Project: Students will develop and test research questions health sciences and produce a report and oral presentation of their findings. This activity will involve:

1. identifying and gaining access to a dataset in their discipline or research areas of interest within health sciences
2. generating hypotheses
3. selecting the appropriate statistical analysis methods to test hypothesis
4. generating the appropriate Univariate and Bivariate Plots, Tables, and Tests using IBM® SPSS® Statistics (alternate: PASW Statistics)
5. summary of findings and interpretation of results

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Attendance Policy: It is a university policy that all students attend **ALL** scheduled classes. Attendance will be taken at each class. It is the student's responsibility to get any missed in-class or out-of-class assignments and/or class notes from class peers. If a student has been chronically absent, the instructor may drop the student. A student absent from a test during the semester is graded zero. Please refer to this link regarding absences for religious holy days and military leave and more details on the university policy.

<http://academics.utep.edu/Default.aspx?tabid=54418>

Excused Absences for University-Recognized Activities: Students who will be absent while representing the University in officially recognized University activities (sports, band, professional conferences, etc.) must notify the Dean of Students no less than ten days prior to the absence. The Dean of Students will provide the student with a letter of excuse for the professors. <http://sa.utep.edu/deanofstudents>

Disabilities: If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 915.747.5148, cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, visit www.utep.edu/CASS. CASS' Staff are the only individuals who can validate and if need be, authorize accommodations for students with disabilities.

Policy on Electronic Devices in Class: Use of electronic devices (i.e., laptops, mobile phones, Smartphones, tablets, MP3 players) is not permitted during this course or lectures. Use of these devices is distracting to your classmates and instructor. If you bring these to class, please turn them off before coming to class. Otherwise, you will be asked to leave the class by the instructor. The instructor will discuss any exceptions regarding personal laptops.

Academic Integrity: Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another student, any act designed to give unfair advantage to a student or the attempt to commit such acts." University policies on scholastic dishonesty will be strictly enforced. For more information, see the *Handbook of Operating Procedures (HOP)* available at <http://admin.utep.edu/Default.aspx?tabid=71782>

Cheating includes:

1. Copying from the homework, in-class work or exam paper of another student, engaging in written, oral, or any other means of communication with another student during an exam or homework assignment, or giving aid to or seeking aid from another student during a test;
2. Possession and/or use during an exam or home test of materials which are not authorized by the person giving the test, such as class notes, books, or specifically designed "crib notes";
3. Using, obtaining, or attempting to obtain by any means the whole or any part of non-administered test, test key, homework solution, or computer program; using a test that has been administered in prior classes or semesters but which will be used again either in whole or in part without permission of the instructor; or accessing a test bank without instructor permission;
4. Collaborating with or seeking aid from another student for an assignment without authority;
5. Substituting for another person, or permitting another person to substitute for one's self, to take a test;
6. Falsifying research data, laboratory reports, and/or other records or academic work offered for credit.

Plagiarism means the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the unacknowledged submission or incorporation of it in one's own academic work offered for credit, or using work in a paper or assignment for which the student had received credit in another course without direct permission of all involved instructors. NOTE: This includes cutting-and-pasting and photocopying from on-line and other material.

Collusion means the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any provision of the rules on scholastic dishonesty.

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TENTATIVE COURSE SCHEDULE *

Dates	Chapters (READ CHAPTER BEFORE CLASS) and SPSS Modules	Assignments
Thursdays		SPSS & BAP
WEEK 1 Aug 28	Introduction to Biostatistics (Chapter 1) SPSS 1. Introduction to SPSS and Importing data	SPSS 1
WEEK 2 Sept 4	Study Designs (Chapter 2) Sources of Data SPSS 2. Entering Data and Defining Variables	SPSS 2
WEEK 3 Sept 11	Quantifying the Extent of Disease (Chapter 3) Summarizing Data (Chapter 4 – categorical) SPSS 3. Data Manipulation SPSS 4. Introduction to Graphing	SPSS 3 SPSS 4 (No HW) BAP1: DATASET
WEEK 4 Sept 18	Summarizing Data (Chapter 4 – continuous) SPSS 5. Univariate Descriptive Statistics and Plots	SPSS 5
WEEK 5 Sept 25	Probability (Chapter 5 – categorical) SPSS 6. One-Sample Binomial Test	SPSS 6 BAP2: VARIABLES
WEEK 6 Oct 2	Probability (Chapter 5 – continuous) SPSS 7. One-Sample t-Test	SPSS 7 Book Questions
WEEK 7 Oct 9	Midterm Review with Book Questions	BAP3: UNIVARIATE
WEEK 8 Oct 16	MIDTERM BOOK CHAPTERS: 2, 4, 5 SPSS: 1-7	
WEEK 9 Oct 23	SPSS 8. Bivariate Descriptive Statistics and Plots	SPSS 8
WEEK 10 Oct 30	BAP Guidelines and Hypotheses Hypothesis Testing Procedures (Chapter 7 – One Sample Tests) SPSS 9. Two-Sample t-Tests and Paired t-Test SPSS 12. Correlation	SPSS 9 SPSS 12 BAP4: HYPOTHESES
WEEK 11 Nov 6	Hypothesis Testing Procedures (Chapter 7 – Chi-Square Tests) SPSS 11. Chi-square Analysis and Odds Ratios	SPSS 11
WEEK 12 Nov 13	Hypothesis Testing Procedures (Chapter 7 – t-tests and ANOVA) SPSS 14. One-Way ANOVA and Multiple Comparisons	SPSS 14
WEEK 13 Nov 20	SPSS 10. Nonparametric tests BAP Work session	SPSS 10 (No HW) BAP5: BIVARIATE
WEEK 14 Nov 27	- HOLIDAY -	
WEEK 15 Dec 4	BAP Presentations (10 minutes/student)	BAP PRESENTATION
WEEK 16	FINAL EXAM: Thursday, Dec 11th 7p – 945p BOOK CHAPTERS: 7 SPSS: 8-12, 14	

* Syllabus is subject to change. Assignments and due dates provided on BlackBoard.
More deadlines: <http://academics.utep.edu/Default.aspx?tabid=74281>