

Quantitative Methods in the Health Sciences I (CHSC 6305)

Course Syllabus

Fall Semester 2017

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 215

Credit Hours: 3 hours

Class Instructor: Dr. Loza

Office Location: HSN 405

Email: oloza@utep.edu

Office Hours: Tuesdays 1130a-1p and Thursdays 1130a-1p

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

Additional Resources:

- Technology Support Center (TSC)
 - Workshops: tsc.utep.edu/workshops

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- o 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: Lecture notes, course material, assignments, graded assignments (with feedback), grades, and other selected materials will be available in class or on BlackBoard (BB). 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%)
- Bivariate Analysis Project (BAP) (35%)
- Exams (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 result

Please note, the instructor reserves the right to change the syllabus during the semester (e.g., deadlines, grading scheme). In the event that a change is made, you will be notified.

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Attendance Policy: It is UTEP policy that **ALL** students attend all scheduled classes. Attendance will be taken at each class. When a student registers for a course, it is assumed that she/he has made arrangements to avoid such conflicts. Students are responsible for any information or activities presented in class discussions, lectures, assignments, and/or readings. If you are unable to attend class, it is your responsibility to inform the instructor before the respective class session. Students may be administratively withdrawn for excessive unexcused absences (**3 classes**). Compliance to due dates, in class presentations, homework, exams and other activities is mandatory. All emergency-related absences must be verified.

<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 or suspect 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 Thursdays | MATERIAL: Chapter Lectures (READ CHAPTER BEFORE CLASS), SPSS Modules, and Bivariate Analysis Project (BAP) | Assignments DUE |
|--------------------------|--|---|
| WEEK 1 Aug 31 | Introduction to Biostatistics (Chapter 1) SPSS 1. Introduction to SPSS and Importing data Special Topics: Sources of Data | |
| WEEK 2 Sept 7 | Study Designs (Chapter 2) SPSS 2. Entering Data and Defining Variables Special Topics: Paso del Norte Healthy Communities Network | SPSS 1 BAP1: DATASET DRAFT |
| WEEK 3 Sept 14 | Summarizing Data (Chapter 4 – categorical) SPSS 3. Data Manipulation SPSS 4. Introduction to Graphing | SPSS 2 BAP1: DATASET |
| WEEK 4 Sept 21 | Summarizing Data (Chapter 4 – continuous) SPSS 5. Univariate Descriptive Statistics and Plots | SPSS 3 SPSS 4 (No HW) BAP2: VARIABLES |
| WEEK 5 Sept 28 | Probability (Chapter 5 – categorical) SPSS 6. One-Sample Binomial Test Probability (Chapter 5 – continuous) SPSS 7. One-Sample t-Test | SPSS 5 BAP3: UNIVARIATE |
| WEEK 6 Oct 5 | - NO CLASS - | SPSS 6 SPSS 7 |
| WEEK 7 Oct 12 | Probability (Chapter 5) – con't Midterm Exam Practice Questions from Textbook | Practice Questions |
| WEEK 8 Oct 19 | MIDTERM BOOK CHAPTERS: 2, 4, 5 SPSS: 1-7 | |
| WEEK 9 Oct 26 | SPSS 8. Bivariate Descriptive Statistics and Plots BAP Guidelines and Hypotheses | |
| WEEK 10 Nov 2 | Hypothesis Testing Procedures (Chapter 7 – One Sample Tests) SPSS 9. Two-Sample t-Tests and Paired t-Test SPSS 12. Correlation | SPSS 8 BAP4: HYPOTHESES |
| WEEK 11 Nov 9 | Hypothesis Testing Procedures (Chapter 7 – Chi-Square Tests) SPSS 11. Chi-square Analysis and Odds Ratios | SPSS 9 SPSS 12 |
| WEEK 12 Nov 16 | Hypothesis Testing Procedures (Chapter 7 – t-tests and ANOVA) SPSS 10. One-Way ANOVA and Multiple Comparisons SPSS 13. Nonparametric tests | SPSS 11 BAP5: BIVARIATE DRAFT |
| WEEK 13 Nov 23 | - HOLIDAY - | SPSS 10 SPSS 13 BAP5: BIVARIATE |
| WEEK 14 Nov 30 | Special Topics: Reports and Summary Tables BAP Work session | BAP PRESENTATION DRAFT |
| WEEK 15 Dec 7 | BAP Presentations (10 minutes/student) Final Exam Practice Questions from Textbook | BAP PRESENTATION Practice Questions |
| WEEK 16 Dec 14 | FINAL EXAM: Thursday, Dec 14th 7p-9p (move time to 5p-7p?) BOOK CHAPTERS: 7 SPSS: 8-13 | |

* Syllabus is subject to change. Assignments and due dates provided on BlackBoard.

More deadlines: <http://academics.utep.edu/Default.aspx?tabid=8910>

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