

# Quantitative Methods in the Health Sciences II

Course Syllabus

Spring Semester 2016

**Course Description:** This is the second in a sequence of applied statistics courses that were designed to meet the needs of beginning doctoral-level research professionals in the health sciences. Following on Quantitative Methods for the Health Sciences I, this course continues to teach 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 simple and multiple linear regression; simple and multiple logistic regression; statistical control of confounding variables and effect modifiers; and sample size and power calculations. Oral and written presentation of the testing and interpretation of hypotheses and analyzed data, and synthesis of findings, are required course activities.

**Prerequisite:** Completed "Quantitative Methods I" or equivalent with grade of B or better, and instructor approval.

**Meeting Time:** Thursdays 5p-750p

**Class Location:** HSN 131

**Credit Hours:** 3 hours

**Class Instructor:** Dr. Oralia Loza

**Office Location:** HSN 405

**Email:** [oloza@utep.edu](mailto: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>

## Recommended Textbooks:

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>

## 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](http://MY.APPS.UTEP.EDU)
  - student license available for purchase online

## Additional Resources:

- Technology Support Center (TSC)
  - Workshops: [tsc.utep.edu/workshops](http://tsc.utep.edu/workshops)
  - Report issues to: <https://servicedesk.utep.edu/> or Frank Poblano [fpoblano@utep.edu](mailto: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.

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**Literature Review and Article Presentations:** Throughout the semester, students will present journal articles in which the statistical methods discussed are applied.

**Analysis Project:** Students will develop and test research questions in 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, Bivariate, and Multivariable Plots, Tables, and Tests using IBM® SPSS® Statistics (alternate: PASW Statistics)
- 5) summary of findings and interpretation of results

**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 public health literature, and compare the strengths and limitations of methods used.
- 5) interpret results of statistical analyses of studies in the health sciences literature in a clear and concise manner

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

- o Assignments (35%)
- o Exams (30%)
- o Multivariate Analysis Project (MAP) (35%)

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

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](mailto:cass@utep.edu), or visit their office located in UTEP Union East, Room 106. For additional information, visit [www.utep.edu/CASS](http://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 \*

<b>Dates</b> Thursdays	<b>Topics</b> (READ CHAPTER BEFORE CLASS)	<b>SPSS + MAP + LIT PRESENTATION DEADLINES</b>
<b>WEEK 1</b> Jan 21	Multivariable Methods (Chapter 9) Confounding and Effect Modification (Section 9.1) <a href="#">SPSS 12. Correlation (Review)</a>	
<b>WEEK 2</b> Jan 28	Multivariable Methods (Chapter 9) Confounding and Effect Modification (Section 9.1) Introduction to Correlation and Regression Analysis (Section 9.3) <a href="#">SPSS 14. Simple Linear Regression</a> <b>Literature Activity 1: Effect Modifier &amp; Confounder Presentation - INSTRUCTIONS</b>	SPSS 12 MAP 1: DATA + VARIABLES
<b>WEEK 3</b> Feb 4	Multivariable Methods: (Chapter 9) Multiple Linear Regression (Section 9.4) <a href="#">SPSS 15. Multiple Linear Regression</a>	SPSS 14 MAP 2: VARIABLES + HYPOTHESES
<b>WEEK 4</b> Feb 11	Multivariable Methods (Chapter 9) Multiple Logistic Regression (Section 9.5) <a href="#">SPSS 16. Multiple Logistic Regression</a> <b>Literature Activity 1: Effect Modifier &amp; Confounder Presentation - DRAFT</b>	SPSS 15 MAP 3: UNIVARIATE ANALYSIS <b>Lit Activity 1: DRAFT</b>
<b>WEEK 5</b> Feb 18	<b>Literature Activity 1: Effect Modifier &amp; Confounder - Presentation</b>	SPSS 16 MAP 4: BIVARIATE ANALYSIS <b>Lit Activity 1: PRESENTATION</b>
<b>WEEK 6</b> Feb 25	Model Building and Diagnostics: Linear Regression <a href="#">SPSS 17. Linear Regression Diagnostics Plots</a>	MAP 5: REGRESSION ANALYSES - DRAFT
<b>WEEK 7</b> Mar 3	<b>MIDTERM</b> BOOK CHAPTERS: 9 (sections 9.1, 9.3-9.5) <a href="#">SPSS 12, 14, 15, 16</a>	
<b>WEEK 8</b> Mar 10	<b>HOLIDAY - Spring Break – No Class</b>	SPSS 17
<b>WEEK 9</b> Mar 17	Power and Sample Size (Chapter 8) Power Analysis Software	MAP 5: REGRESSION ANALYSES
<b>WEEK 10</b> Mar 24	Model Building and Diagnostics: Logistic Regression <b>Literature Activity 2: Model Building Presentation INSTRUCTIONS</b>	MAP 6: REGRESSION DIAGNOSTICS
<b>WEEK 11</b> Mar 31	Data Summaries and Interpretation: Bivariate Analysis <b>Multivariate Analysis Project (MAP) Outline</b>	MAP 7: TABLE 1 (LINEAR + LOGISTIC ANALYSIS)
<b>WEEK 12</b> April 7	Data Summaries and Interpretation: Bivariate Analysis <b>Literature Activity 2: Model Building Presentation - DRAFT</b>	<b>Lit Activity 2: DRAFT</b> MAP 8: TABLE 2 (LINEAR + LOGISTIC ANALYSIS)
<b>WEEK 13</b> April 14	Data Summaries and Interpretation: Multivariate Analysis <b>Literature Activity 2: Model Building - Presentation</b>	<b>Lit Activity 2: PRESENTATION</b> MAP 7 and 8 - REVISIONS
<b>WEEK 14</b> April 21	Data Summaries and Interpretation: Multivariate Analysis	MAP PRESENTATION - DRAFT
<b>WEEK 15</b> April 28	<b>Multivariate Analysis Project (MAP) Presentations</b>	MAP PRESENTATION
<b>WEEK 16</b> May 5	<b>CHS Pre-Commencement and Graduate Hooding Ceremony (TENTATIVE)</b>	
<b>WEEK 17</b> May 12	<b>FINAL EXAM: Thursday, May 12th 7:00 pm – 9:45 pm</b>	

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

More deadlines: <http://academics.utep.edu/Default.aspx?tabid=68816>