

# Quantitative Methods in the Health Sciences II (CHSC 6306)

Course Syllabus

Spring Semester 2022

**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:** HSSN 212

**Credit Hours:** 3 hours

**Class Instructor:** Dr. Oralia Loza

**Office Location:** HSSN 405

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

**Office Hours:** Tuesdays 1130a-1p and Thursdays 1130a-1p via Zoom

## 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 (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>

## Required Software:

1. Microsoft Office (Word, Excel, and PowerPoint)
  - Download Microsoft Office programs for free via UTEP at [Microsoft Office 365](#).
2. IBM® SPSS® data management and statistical analysis software
  - Download SPSS for free via UTEP at [SPSS IBM](#).
  - Access online free at UTEP [MY.APPS.UTEP.EDU](#)
  - You can also purchase discounted student license for the Standard GradPack (any version) at OnTheHub or Student Discounts
3. [Zoom](#)
4. [Google Chrome](#)

## Campus Resources:

- [Technology Support Center \(TSC\)](#) Computer Lab  
Workshops: [https://www.utep.edu/technologysupport/TSCenter/tsc\\_workshops.html](https://www.utep.edu/technologysupport/TSCenter/tsc_workshops.html)
- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in-person on campus.

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- [UTEP Library](#): Access resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.

**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 the deadline. Submissions will receive no credit if submitted after two days.

**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
5. summary of findings and interpretation of results

**Exams:** Exams will be administered using [Respondus Lock Down Browser](#) and Respondus Monitor inside of Blackboard to promote academic integrity. You are encouraged to learn more about how to use these programs prior to the first test. [https://www.utep.edu/technologysupport/Files/docs/MM\\_Respondus-Student.pdf](https://www.utep.edu/technologysupport/Files/docs/MM_Respondus-Student.pdf)

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

**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. 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.
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

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

- Assignments (40%)
- Multivariate Analysis Project (MAP) (40%)
- Exams (20%)

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

## **COVID-19 PRECAUTION STATEMENT**

Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to [covidaction@utep.edu](mailto:covidaction@utep.edu), so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID-19 testing.

The Center for Disease Control and Prevention (CDC) recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit [epstrong.org](http://epstrong.org).

**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 (except for online course), mobile phones, tablets, MP3 players) is not permitted during this course or lectures. If a situation should arise which necessitates a student to be contacted by a physician or family member, the instructor shall be notified and cell phone can be set to "vibrate." Please be advised that students who use unauthorized technology during class time will be dismissed from that week's class session.

**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

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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 violate any provision of the rules on scholastic dishonesty.

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<b>COURSE SCHEDULE *</b>		
<b>Dates Thursdays</b>	<b>Topics and Textbook Chapter (READ CHAPTER BEFORE CLASS)</b>	<b>Assignments Due (5p)</b>
WEEK 1 Jan 20	Chapter 9. Multivariable Methods Section 9.1. Confounding and Effect Modification <b>Multivariate Analysis Project (MAP): Overview</b>	
WEEK 2 Jan 27	Chapter 9. Multivariable Methods Section 9.3. Introduction to Correlation and Regression Analysis <b>SPSS 14. Simple Linear Regression</b> <b>Literature Activity 1: Effect Modifier &amp; Confounder - INSTRUCTIONS</b>	Syllabus Contract <b>MAP 1: DATA + VARIABLES</b>
WEEK 3 Feb 3	Chapter 9. Multivariable Methods Section 9.4. Multiple Linear Regression <b>SPSS 15. Multiple Linear Regression</b> <b>Literature Activity 1: Effect Modifier &amp; Confounder - REVIEW ARTICLES</b>	<b>SPSS 14</b> <b>MAP 2: VARIABLES + HYPOTHESES</b> <b>LIT ACTIVITY 1: ARTICLES</b>
WEEK 4 Feb 10	Chapter 9. Multivariable Methods Section 9.5. Multiple Logistic Regression <b>SPSS 16. Multiple Logistic Regression</b> <b>Literature Activity 1: Effect Modifier &amp; Confounder - DRAFT</b>	<b>SPSS 15</b> <b>MAP 3: UNIVARIATE ANALYSIS</b> <b>LIT ACTIVITY 1: PRESENTATION DRAFT</b>
WEEK 5 Feb 17	<b>Literature Activity 1: Effect Modifier &amp; Confounder - PRESENTATIONS</b> <b>MAP: Work session (bring laptop)</b>	<b>SPSS 16</b> <b>MAP 4: BIVARIATE ANALYSIS - DRAFT</b> <b>LIT ACTIVITY 1: PRESENTATION (430P)</b>
WEEK 6 Feb 24	<b>MAP 5: Regression Analyses - Draft Review</b> <b>MIDTERM EXAM: REVIEW</b>	<b>MAP 4: BIVARIATE ANALYSIS</b> <b>MAP 5: REGRESSION ANALYSES - DRAFT</b>
WEEK 7 Mar 3	<b>MIDTERM EXAM</b> <b>BOOK CHAPTERS: 9 (sections 9.1, 9.3-9.5) and SPSS 14, 15, 16</b>	
WEEK 8 Mar 10	Model Building and Diagnostics: Linear and Logistic Regression <b>SPSS 17. Linear Regression Diagnostics Plots</b> <b>MAP: Presentation Outline and Guidelines &amp; Template</b> <b>Literature Activity 2: Model Building Presentation - INSTRUCTIONS</b>	<b>MAP 5: REGRESSION ANALYSES - REVISED DRAFT</b>
WEEK 9 Mar 17	<b>HOLIDAY - SPRING BREAK - NO CLASS</b>	<b>MAP 5: REGRESSION ANALYSES</b> <b>SPSS 17</b>
WEEK 10 Mar 24	<b>Literature Activity 2: Model Building Presentation - INSTRUCTIONS</b> <b>MAP: Table Making - Univariate and Bivariate Analysis</b>	<b>MAP 6: REGRESSION DIAGNOSTICS</b>
WEEK 11 Mar 31	<b>Literature Activity 2: Model Building Presentation - REVIEW ARTICLES</b> <b>MAP: Table Making - Univariate and Bivariate Analysis</b>	<b>MAP 7: TABLE 1 (LINEAR + LOGISTIC ANALYSIS) - DRAFT</b> <b>LIT ACTIVITY 2: ARTICLES</b>
WEEK 12 April 7	<b>Literature Activity 2: Model Building Presentation - DRAFT</b> <b>MAP: Table Making - Multivariate Analysis</b>	<b>MAP 7: TABLE 1 (LINEAR + LOGISTIC ANALYSIS)</b> <b>LIT ACTIVITY 2: PRESENTATION DRAFT</b>

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WEEK 13 April 14	<b>Literature Activity 2:</b> Model Building - <b>PRESENTATIONS</b> <b>MAP:</b> Table Making - Review	MAP 8: TABLE 2 (LINEAR + LOGISTIC ANALYSIS) LIT ACTIVITY 2: PRESENTATION (430P)
WEEK 14 April 21	Chapter 8. Power and Sample Size Special Topics: Power Analysis Software	MAP 7 AND 8 - REVISIONS
WEEK 15 April 28	<b>MAP:</b> Work session (bring laptop)	MAP PRESENTATION - DRAFT
WEEK 16 May 5	<b>MAP:</b> Oral Presentations	MAP PRESENTATION (430P)
WEEK 17 May 9-13	<b>Finals Week</b>	

\* 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. Assignments and due dates are provided on BlackBoard. University calendar: <http://catalog.utep.edu/undergrad/welcome-to-utep/academic-calendar/>