Quantitative Methods in the Health Sciences II (CHSC 6306)

Course Syllabus   Spring Semester 2020

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 Instructor**: Dr. Oralia Loza
Class Location: HSN 212   **Office Location**: HSN 405
Credit Hours: 3 hours   **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

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)
2. IBM® SPSS® Statistics Standard GradPack (any version number): 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 at OnTheHub or Student Discounts

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: 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.

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 disciple 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

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

Evaluation and Course Grade: Student performance will be evaluated on the basis of:
   o Assignments (40%)
   o Multivariate Analysis Project (MAP) (40%)
   o Exams (20%)

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

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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Course Syllabus   Spring Semester 2020

COURSE SCHEDULE *

Dates Thursdays	MATERIAL: Chapter Lectures (READ CHAPTER BEFORE CLASS), SPSS Modules, and Multivariate Analysis Project (MAP)	Assignments DUE SPSS + MAP + LIT PRESENTATION
WEEK 1 Jan 23	Chapter 9. Multivariable Methods Section 9.1. Confounding and Effect Modification **Multivariate Analysis Project (MAP):** Overview	
WEEK 2 Jan 30	Chapter 9. Multivariable Methods Section 9.3. Introduction to Correlation and Regression Analysis **SPSS 14.** Simple Linear Regression **Literature Activity 1:** Effect Modifier & Confounder - **INSTRUCTIONS**	MAP 1: DATA + VARIABLES
WEEK 3 Feb 6	Chapter 9. Multivariable Methods Section 9.4. Multiple Linear Regression **SPSS 15.** Multiple Linear Regression **Literature Activity 1:** Effect Modifier & Confounder - **REVIEW ARTICLES**	SPSS 14 MAP 2: VARIABLES + HYPOTHESES LIT ACTIVITY 1: ARTICLES
WEEK 4 Feb 13	Chapter 9. Multivariable Methods Section 9.5. Multiple Logistic Regression **SPSS 16.** Multiple Logistic Regression **Literature Activity 1:** Effect Modifier & Confounder - **DRAFT**	SPSS 15 MAP 3: UNIVARIATE ANALYSIS LIT ACTIVITY 1: DRAFT
WEEK 5 Feb 20	**Literature Activity 1:** Effect Modifier & Confounder - **PRESENTATIONS** **MAP:** Work session (bring laptop)	SPSS 16 MAP 4: BIVARIATE ANALYSIS - DRAFT LIT ACTIVITY 1: PRESENTATION (430P)
WEEK 6 Feb 27	**MAP 5:** Regression Analyses - Draft Review **MIDTERM EXAM:** REVIEW	MAP 4: BIVARIATE ANALYSIS MAP 5: REGRESSION ANALYSES - DRAFT
WEEK 7 Mar 5	**MIDTERM EXAM** BOOK CHAPTERS: 9 (sections 9.1, 9.3-9.5) SPSS 14, 15, 16	
WEEK 8 Mar 12	Model Building and Diagnostics: Linear Regression Model Building and Diagnostics: Logistic Regression **SPSS 17.** Linear Regression Diagnostics Plots **MAP:** Presentation Outline and Guidelines & Template	MAP 5: REGRESSION ANALYSES – REVISED DRAFT
WEEK 9 Mar 19	**HOLIDAY –** SPRING BREAK **- NO CLASS**	MAP 5: REGRESSION ANALYSES SPSS 17
WEEK 10 Mar 26	**Literature Activity 2:** Model Building Presentation - **INSTRUCTIONS** **MAP:** Table Making - Univariate and Bivariate Analysis	MAP 6: REGRESSION DIAGNOSTICS
WEEK 11 April 2	**Literature Activity 2:** Model Building Presentation - **REVIEW ARTICLES** **MAP:** Table Making - Multivariate Analysis	MAP 7: TABLE 1 (LINEAR + LOGISTIC ANALYSIS) LIT ACTIVITY 2: ARTICLES
WEEK 12 April 9	**Literature Activity 2:** Model Building Presentation - **DRAFT** **MAP:** Table Making – Review	MAP 8: TABLE 2 (LINEAR + LOGISTIC ANALYSIS) LIT ACTIVITY 2: DRAFT
WEEK 13 April 16	**Literature Activity 2:** Model Building - **PRESENTATIONS**	MAP 7 AND 8 – REVISIONS LIT ACTIVITY 2: PRESENTATION (430P)
WEEK 14 April 23	Chapter 8. Power and Sample Size **Special Topics:** Power Analysis Software	MAP PRESENTATION - DRAFT
WEEK 15 April 30	**MAP:** Work session (bring laptop)	
WEEK 16 May 7	**MAP:** Oral Presentations	MAP PRESENTATION (430P)
WEEK 17 May 14	**MAP:** Oral Presentations (7p-945p)	