MPAD 504 Data Analysis
Fall 2018

Time: Tuesdays 6:30-9:20
Location: McGauvrnan 310
Instructor: Sara Chaganti
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Office Hours: Tuesdays 4-5:30 (location TBD) or by appointment

THIS SYLLABUS IS SUBJECT TO CHANGE.
PLEASE CHECK BLACKBOARD FOR UPDATES.

Course Description
This course provides students with a basic introduction to the use of quantitative methods in policy research. It is very much designed as a course in applied statistics, covering common topics such as types of variables and data, probability theory, hypothesis testing, measures of central tendency and variance, as well as tools for examining basic relationships between two variables: contingency tables, correlation and bivariate regression. Weekly homework assignments ask students to work with actual data and develop skills for quickly analyzing data, reporting the results, and using their conclusions to inform decision-making.

In an increasingly data-driven world, even those who are not using quantitative analysis on a daily basis need to have the skills and ability to understand, analyze and critique quantitative studies and presentations. This course serves as an introduction to the use of probability, statistics and data visualization in the policy arena. It also introduces students to the use of case-oriented comparative methods, as administrators of public agencies are often confronted with appraisals of programs that create data that do not meet the assumptions necessary for appropriate application of traditional statistical analyses. Its purpose is to offer an introductory and broad-based skillset to students; regardless of any background they may or may not have in mathematics or applied statistics.

Required Text:
- Supplementary readings will be made available on Blackboard.

Pre-requisites: None

Objectives/Learning Outcomes/Course Expectations
This course emphasizes the development of skills to analyze and interpret data likely to be encountered in public and non-profit agencies. While concerning itself primarily with basic statistical approaches common in the social science, the course will also explore the need for administrators to develop skills to perform rigorous comparisons between qualitative program data. The course will detail approaches to data collection, interpretation, analysis, and presentation from the point of view of the practicing public administrator, and will emphasize practical applications for these skills in public service organizations.

By the completion of this course, students will be able to:
1. Open data in a statistical software application and work with a codebook.
2. Present visualizations of variables and relationships.
3. Understand and interpret probability distributions, and apply hypothesis testing.
4. Interpret the elements of a basic regression analysis.
5. Design and implement a basic test of an original hypothesis.
6. Understand the limitations of quantitative methods and articulate the differences between correlation and causation.
7. Understand how to analyze and interpret qualitative data in rigorous fashion.
8. Demonstrate the ability to present interpretation of statistical analysis effectively and clearly in written documents and oral presentations.

Accommodations:
The University of Massachusetts Lowell is committed to serving all students with disabilities as defined by federal regulations. If you have a disability and are not yet being accommodated please contact the Office of Student Disability Services at disability@uml.edu to register for accommodations. If you are receiving accommodations please speak to me during office hours, or privately after class, as we want to protect your privacy, so that we can make appropriate arrangements to receive your classroom and testing accommodations. Please contact me as soon as possible to ensure that we can provide accommodations as the semester begins.

Additionally, Student Disability Services supports software for ALL students. Read&Write Gold is literacy software that allows you to read on-screen text aloud, research and check written work, and create study guides. You can download the software from the IT Software webpage on the UML website: https://www.uml.edu/IT/Services/Software/Read-Write-Gold.aspx

Grading:
20% Final Project: Students propose a quantitative or mixed methods study and identify relevant data to test a hypothesis (6-8 pages)
15% Homework assignments (5): Short problem sets asking students to apply what they have learned in class to real world data using a statistical computing program.
10% Group Assignment: Students will complete one assignment in groups, in which they will present a research article to their classmates and facilitate a discussion.
15% Attendance and Participation: Students are required to attend class and actively participate in group discussions about course materials.
40% Exams: This course will include and midterm and final exam. Exams will be in-class problem-based exams that test students’ ability to perform the basic set of analytical tools learned in the class.

Attendance & Late Work:
Students are allowed one unexcused absence each. Additional unexcused absences will negatively affect the final grade. If you know that you will have to miss an additional class, please inform the instructor ahead of time to discuss arrangements.

Work is expected to be delivered on time. If you know you will not be able to hand in an assignment by the due date, please speak to the instructor ahead of time to discuss alternate arrangements. Late work will not be accepted without such prior discussion.
Week 1: September 11 INTRODUCTION

Week 2: September 18 THE RESEARCH PROCESS

Readings: Eller Section 1 Preview, Chapter 1, Chapter 3

Key concepts:
- Evidence
- Scientific Method
- Deduction
- Inference
- Operationalization
- Variable
- Hypothesis

Week 3 September 25 USING RESEARCH IN PUBLIC ADMINISTRATION; LITERATURE REVIEWS, THEORY

Reading: Eller Chapter 2 (skim up to 31, then read), Chapter 4

Key Concepts:
- Evidence-based practice
- Literature

Week 4 October 2 RESEARCH DESIGN

Reading: Eller Section II: Preview, Chapter 5

Key Concepts:
- Reliability
- Validity
- Experiment
- Quasi-Experiment

Group Presentation 1 (everyone reads article)

Week 5 October 9 MEASUREMENT AND SAMPLING

Reading: Eller Chapters 6,7

Key Concepts:
- Operationalization
- Variable
- Quantitative/Qualitative
- Nominal/Ordinal/Integral
- Measurement Error
- Reliability
- Validity
• Random Sampling

Group Presentation 2 (everyone reads article)

**Week 6 October 16 DESCRIPTIVE STATISTICS, MEASURES OF CENTRAL TENDENCY**

Reading: Eller Section III: Preview, Chapter 13

Key Concepts:
• Central Tendency
• Mean, Median, Mode
• Range
• Variance
• Standard Deviation

Problem Set 1 Due

**Week 7 October 23 MIDTERM EXAM**

Final paper topic + 3 proposed references due by email

**Week 8 October 30 PROBABILITY & HYPOTHESIS TESTING**

Reading: Eller Chapter 14, 15

Key Concepts:
• Probability
• Distribution
• Z-score
• T-score
• Chi-squared
• Hypothesis (Null, Alternate)

Problem Set 2 Due

Group Presentation 3 (everyone reads article)

**Week 9 November 6 LINEAR REGRESSION**

Reading: Eller Section IV: Preview, Chapter 17

Key Concepts:
• Coefficient
• Ordinary Least Squares
• Dichotomous Variable

Problem Set 3 Due
Group Presentation 4 (everyone reads article)

**Week 10 November 13 QUALITATIVE DATA: THEORY AND METHODS**

Reading: Eller Chapter 8, 9, 10

Key Concepts:
- Case Study
- Interview
- Focus Group
- Informed Consent
- Code
- Participant Observation
- Standpoint Theory

Problem Set 5 Due

Group Presentation 5 (everyone reads article)

--- NOVEMBER 20 NO CLASS ---
(USE THE WEEK TO WORK ON FINAL PAPER)

**Week 11 November 27 QUALITATIVE DATA ANALYSIS**

Reading: Eller Chapter 12

Key Concepts:
- Coding
- Epistemology
- Inductive
- Deductive

Group Presentation 6

**Week 12 December 4 MIXED METHODS**

Reading: Eller Chapter 20

Key Concepts:
- Corroborate
- Triangulate
- Trends
- Mechanisms

**Week 13 December 11 WRAPPING UP**

---FINAL PAPER DUE MONDAY DECEMBER 17, 9AM---