

Analysis & Decision Making

Christopher B. Goodman, Ph.D.

cbgoodman@unomaha.edu

402.554.5905

Spring 2019. AH 304 & CPACS 219.

Mondays 5:30pm–8:10pm.

Office Hours: By appointment.

COURSE DESCRIPTION

Decision-making supported by quantitative analysis is becoming increasingly important in the public and nonprofit sectors. As a result, managers are expected to be fluent in quantitative analytical skills. This course is a graduate level, introductory statistics and research methodology course. It will focus on applied quantitative analysis for public/nonprofit management and policy. The goal of the course is two-fold: (1) to train you to apply the concepts presented and use them to inform real world decision-making in the public and nonprofit sectors and (2) to prepare you to successfully complete your capstone project.

COURSE OBJECTIVES

Upon successful completion of this course, students should be able to:

1. Identify and define key theories and concepts of research design, descriptive and inferential statistics, multiple regression.
2. Design and execute an analytical research project.
3. Demonstrate proficiency regarding data collection, analysis, and evaluation.
4. Critically evaluate research designs and methods presented in applied and academic sources.
5. Correctly select and apply the appropriate analytical tool for the problem and data at hand.
6. Understand and evaluate the ethical issues surrounding data collection, analysis, and evaluation.

Student progress on these learning objectives will be measured through a combination of homework assignments, class discussion, and a course paper.

TEXTBOOKS

The main texts of this course are available at the bookstore. However, these books likely can be obtained cheaper elsewhere (primarily online).

Levine, David M. et al 2016. *Statistics for Managers using Microsoft Excel*. 8e. Pearson.

Previous editions may be fine, but I make no guarantees that they will be. It is up to you determine if a previous edition is appropriate. I also require that you have/purchase a MyStatLab code as we will be using that system for all homework. The code should come with new books and can be purchased for used books from Pearson.

Gooden, Susan T. & RaJade M. Berry-James. 2018. *Why Research Methods Matter: Essential Skills for Decision Making*. Melvin & Leigh.

REQUIREMENTS

PARTICIPATION – 20%

This course operates as a “flipped classroom” with little to no formal lecture during class time. Rather, you will be working individually and in groups to complete various exercises in the classroom. Your participation in these exercises is essential to successfully completing the course. The participation portion of your grade is contingent upon these exercises as well as the pre-work necessary to prepare for them. This will be explained to a much greater extent in the first class session.

HOMEWORK – 40%

We will be using MyStatLab as a platform for homework assignments. There will be assignments approximately each week. Homework will be due at three points in time during the semester.

RESEARCH PROJECT – 35%

This project is designed to mimic the Capstone process. I will require you to submit a proposal, your literature review, an overview of your data, and analytical section. The last three will form the basis of your research project. I will distribute more information on each individual part as the class progresses.

As a part of this assignment, I will require you to become CITI certified. Certification will be necessary should you want to collect your own data for your capstone project. The process takes about four hours. More information on the process can be found at <https://www.citiprogram.org/>.

COURSE METHODOLOGY & POLICIES

Class time will be spent working problems, answering questions, and doing group work. There will be little to no lecture in class. As such, it is your responsibility to consume the course material *before* class time and come armed with questions about the readings. I will regularly send out pre-work for class which could take the form of a poll, a single or series of questions, or a case to think about for class. It is essential that these assignments are completed before class time as our time together is contingent upon this work.

I will be teaching this course as an introductory graduate course in statistics and research methodology that combines theoretical and conceptual topics with practical application. It is my assumption that students

have limited undergraduate or graduate exposure to the topics covered in this course. As such, there is a large amount of material to cover in this course, and we will be moving quickly. Do not fall behind in the reading. It will be difficult to catch up.

COMMUNICATIONS

Course announcements will be made via email so it is imperative that you check your e-mail daily. “I didn’t get the email” is never a valid excuse. The most effective method of communicating with me is using email; however, you are also encouraged to schedule a meeting at my office or a phone call.

CALCULATORS & SOFTWARE

It is **required** that you have a calculator with square root functionality for this class. We will likely use a calculator in every subject. As such, please plan on having access to a calculator.

We will use Excel, a database and statistical software package, in this course. As such, you’ll need consistent access to Microsoft Office.

LATE ASSIGNMENTS

Late assignments **WILL NOT** be accepted without a valid UNO excuse. If you have a schedule conflict on any day an assignment is due, please contact me beforehand to make arrangements for turning in your assignment early.

STUDENTS WITH DISABILITIES

If you have or believe you have a disability that may impede your learning, please contact the Disability Services Office. I will make every effort to accommodate you in accordance with UNO policy, procedures, and recommendations. Additional information can be found at <http://www.unomaha.edu/student-life/inclusion/disability-services/students/where-to-begin.php>.

DIVERSITY STATEMENT

There must be a **clear respect for diversity** maintained in the class. This includes respect for people related to gender, sexual orientation, religious identity, disability, age, socio-economic status, ethnicity, race, culture and other differences. All of us have something to offer, and together, we can cultivate a classroom environment where individuals of varying opinions, experiences, and backgrounds are able to learn in a supportive and inclusive setting.

ACADEMIC HONESTY

All students at the UNO are expected to conduct their academic affairs in an honest and responsible manner. Any student found guilty of dishonesty in academic work shall be subject to disciplinary actions. Acts of academic dishonesty include, but are not limited to:

- plagiarism, i.e., the intentional appropriation of the work, be it ideas or phrasing of words, of another without crediting the source;

- cheating, i.e, unauthorized collaboration or use of external information during examinations; assisting fellow students in committing an act of cheating;
- falsely obtaining, distributing, using or receiving test materials or academic research materials; submitting examinations, themes, reports, drawings, laboratory notes, research papers or other work as one's own when such work has been prepared by another person or copied from another person (by placing his/her own name on a paper, the student is certifying that it is his/her own work); or
- improperly altering and/or inducing another to improperly alter any academic record.

Additionally, graduate students are more likely to assume roles as active scholars. With these roles come added responsibilities for academic honesty. For such individuals academic honesty requires an active pursuit of truth not just an avoidance of falsehood. This pursuit includes but is not limited to:

- providing a full and complete representation of any scholarly find, be it experimental data or information retrieved from archives;
- taking care that the resources of the University (e.g., library materials, computer, or laboratory equipment) are used for their intended academic purposes and they are used in a manner that minimizes the likelihood of damage or unnecessary wear;
- assuring that one's co-workers are given due credit for their contributions to any scholarly endeavor; respecting a diversity of opinion and defending one's colleagues as well as one's own academic freedom; respecting the rights of other students who may come under the tutelage of the graduate student and being fair
- and impartial in grading and other forms of evaluation; and seeking permission from an instructor when submitting to that instructor work which the student has submitted for a course taken in the past or intends to submit for another course currently being taken.

In cases of alleged academic dishonesty, the instructor shall attempt to discuss the matter with the student and explain the sanction(s) which he/she plans to impose. In the event that the student challenges the allegation of academic dishonesty, or is not satisfied with the sanctions(s) imposed by the instructor, the student may file an appeal according to the approved appeal policies of the University of Nebraska Graduate College.

COURSE OUTLINE

Week 01, 01/07 - 01/11: Introduction to Social Research

- Levine et al. Chapter 0: First Things First.
- Gooden & Berry-James. Chapter 1: The Art of Research Methods.
- Gooden & Berry-James. Chapter 2: Evidence Based Decision Making: Programs, Practices and Approaches.

Week 02, 01/14 - 01/18: Research Design, Part I

Topics: Research ethics; Research design

- Gooden & Berry-James. Chapter 3: Research Ethics: Important Considerations for Practitioners
- Gooden & Berry-James. Chapter 4: Practical Considerations in Research Design
- de Vaus, David. 2001. *Research Design in Social Science*, Chapter 1.

Week 03, 01/21 - 01/25: No Class – Martin Luther King Day

Week 04, 01/28 - 02/01: Research Design, Part II

Topics: Research design; Variables

- Levine et al. Chapter 1, Section 1.1: Defining Variables.
- Gooden & Berry-James. Chapter 5: Variable Definition: Are We Really Talking About the Same Thing?

Week 05, 02/04 - 02/08: Research Design, Part III

Topics: Data collection

- Levine et al. Chapter 1, Section 1.2-1.5.
- Gooden & Berry-James. Chapter 6: Questionnaire Construction
- Gooden & Berry-James. Chapter 7: Data Collection Strategies

Week 06, 02/11 - 02/15: Visualizing Data

Topics: Data visualization

- Levine et al. Chapter 2: Organizing and Visualizing Variables.
- Healy, Kieran. 2018. [What Makes Bad Figures Bad](#) in *Data Visualization: A practical introduction*.
- Yau, Nathan. 2018. [Why People Make Bad Charts \(and What to Do When it Happens\)](#) in *Flowing Data*.
- Schwabish, Jon. 2018. [DataViz Cheatsheet](#) at [PolicyViz](#).

Week 07, 02/18 - 02/22: Descriptive Statistics

Topics: Central tendency; Variation; Covariation; Correlation

- Levine et al. Chapter 3: Numerical Descriptive Measures.

Week 08, 02/25 - 02/29: Probability & the Normal Curve

- Levine et al. Chapter 4: Basic Probability.
- Levine et al. Chapter 6: The Normal Distribution and other Continuous Distributions.

Week 09, 03/03 - 03/07: Sampling & Confidence Intervals

- Levine et al. Chapter 7: Sampling Distributions.
- Levine et al. Chapter 8: Confidence Interval Estimation.

Week 10, 03/10 - 03/14: One-Sample Tests

- Levine et al. Chapter 9: Fundamentals of Hypothesis Testing: One-Sample Tests.
- Gooden & Berry-James. Chapter 8: Significance of Findings and the Relationship to Practitioner Decision Making.

Week 11, 03/17 - 03/21: *No Class – Spring Break***Week 12, 03/24 - 03/28:** Two-Sample Tests

- Levine et al. Chapter 10: Two-Sample Tests.

Week 13, 03/31 - 04/04: ANOVA & Chi-Squared

- Levine et al. Chapter 11: Analysis of Variance. *Focus your energies on section 11.1.*
- Levine et al. Chapter 12: Chi Squared. *Focus your energies on section 12.3.*

Week 14, 04/07 - 04/11: Simple Linear Regression

- Levine et al. Chapter 13: Simple Linear Regression.

Week 15, 04/14 - 04/18: Multiple Regression

Topics: Multiple regression; Using research to inform policy/management

- Levine et al. Chapter 14: Introduction to Multiple Regression.
- Gooden & Berry-James. Chapter 9: Onward! Linking Research to Action

Week 16, 04/21 - 04/25: *No Class – work on your final paper***Week 17, 04/28 - 05/02:** *Final Paper Due*