

CCJ 5706: APPLIED STATISTICS IN CRIMINOLOGY (Spring 2009)
(Distance Learning Program)

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COURSE DESCRIPTION

This course is an introduction to applied statistical techniques in the field of criminology and criminal justice. It is taught as a basic course in statistics and presumes minimal mathematical or statistical background. It does assume that the student has had some undergraduate introduction to statistics such as CCJ 4700 (Introduction to Research Methods and Statistics in Criminology and Criminal Justice) or its equivalent. It starts by reviewing much of this introductory material but goes through some of these topics fairly quickly. It covers the computation, interpretation and understanding of basic descriptive statistics, inferential statistics, measures of association and correlation, analysis of variance, and regression analysis. Some of the other more advanced multivariate techniques are briefly introduced. The course is aptly titled "applied statistics," however, and stresses the what, how, when and why of various statistical techniques. It involves the use of simple formulas and computations, but avoids the mathematical derivation of formulas or detailed examination of theoretical statistics.

COURSE OBJECTIVES

At the end of the course the student will be able to:

1. compute, interpret, and understand the use of basic descriptive statistics,
2. compute, interpret, and understand the use of inferential statistics,
3. compute, interpret, and understand the use of measures of association and correlation,
4. compute, interpret, and understand the use of the analysis of variance techniques,
5. compute, interpret, and understand the use of basic regression techniques, and
6. have a general understanding of when and why other multivariate techniques might be used.

TEXTBOOK

The main textbook for the course is Ronet Bachman and Raymond Paternoster, Statistical Methods for Criminology and Criminal Justice, (3rd ed.), McGraw-Hill, New York, 2009. The notation (B&P) will be used to refer to the reading assignments listed on the outline in reference to this text. Two other documents, "Chapter Outlines" and a "Study Guide" that accompany the text are available in the course library. Some on-line materials that the student locates will be used and additional materials may be made available by the instructor.

COURSE REQUIREMENTS

Several interrelated activities and exercises will be required, all aimed at helping the student grasp the materials being studied in this course. Obviously, this process begins with a careful reading of the materials in P&B currently being covered. Additionally, you will want to look at the "Chapter Outlines" and "Study Guide" provided in the course library, as well as some other on-line sources. In some cases it may also require that you

go back and review materials from an earlier chapter. These assignments are discussed in more detail below.

1. Practice Problems - After reading each assignment in P&B all students should work at least one of the Practice Problems at the end of the chapter. Half of the class, alternating each week (last name A-M first week, last name N-Z the second week, A-M the third week, etc.) should post your answer for other students to read and provide a response. (NOTE: This process does not start until the second week [Jan. 11-17]) All Practice Problems should be posted on the Discussion Board in the thread started for that week. Practice Problems should be posted by midnight **Monday** each week. (**Note: I am aware that the text provides succinct answers to all of the Practice Problems at the end of the chapter. Try not to look at these until after you have attempted to answer the question but feel free to use this information before you submit your answer. However, I expect your answer to be more complete or provide greater detail and show all of the logical steps involved in answering a question or calculating an answer.**)

2. Student Comments on Practice Problems – Study all of the Practice Problems posted by other students and select one or two and prepare a short response (1-3 paragraphs) that critiques the strengths and weaknesses of the answer submitted. (All students should provide at least one comment each week.) The student Comments are very important because they provide an opportunity for students to help other students obtain a better understanding of the concepts covered. Comments such as “good job,” “nice work” etc. are occasionally sufficient, but comments that include a constructive criticism, a thoughtful question, or a suggestion for a different approach or another way of looking at the problem are more helpful. These Comments should be posted on the Discussion Board by midnight **Wednesday** of each week.

NOTE: These Practice Problems and Comments will not be graded on a weekly basis, but they will be read, recorded, and commented upon when appropriate. More importantly, as a total set of individual student weekly activities, they will be thought of as “Class Participation” and will count as **10% of the final grade**. The quality of the work done on the Practice Problems and your Comments on other student assignments will also be used in making decisions on borderline final grades.

3. Individual Assignments - A “threaded discussion” is an electronic forum that simulates the instructor-student, and student-student, interchanges that take place in a real-time classroom setting. These threads will start each week with the exercises submitted by the lucky students. During most weeks one or more questions or problems will be assigned to one or more students to answer. (A list of students and assignments with the dates for presentation will be provided after the class roster is finalized.) **Students assigned to one of the exercises should have the assignment posted on the Discussion Board by midnight Tuesday of the assigned week.**

Other students are expected to read all of the assignments submitted and respond to at least one of these assignments with a helpful critique either disagreeing, correcting a mistake, showing an easier way to do something, providing a different perspective, providing a different example, raising questions for the original submitter to respond to, (or giving accolades when appropriate, but this is seldom the most appropriate or helpful response). One high quality response is sufficient, but you may do more and this may help you think about and learn the material a little better. **These responses should be posted on the Discussion Board by midnight Friday of the assigned week.**

A particular advantage of the threaded discussion medium is that it allows for the orderly and systematic discussion of important topics. It works like a “bulletin board”, only it utilizes an outline form of organization.

Each “thread” corresponds to a topic of discussion. Students and instructors can post appropriate contributions under suitable threads, thereby encouraging focus and discouraging off-topic digressions. If salient distinctions within a topic should emerge, there is a provision for the creation of a “sub-thread”, or “subheading”, so as to allow for exploration of the distinctions without losing sight of the fundamental themes of the exchange.

An advantage of the electronic forum not present in the normal classroom setting is your ability to participate, within constraints, at your leisure. Thus, you are not required to respond “on the spot”, as you will have sufficient time to mull over your thoughts before contributing. Having said this, the additional time to think generates expectations that your contributions will be lucid, concise and thoughtfully expressed.

All students are expected to participate in these activities in a timely manner. A log will be maintained of the number and quality of your assignments and responses. The total of these assignments and responses will count as **10% of the final grade**. **(NOTE: ANY ASSIGNMENTS OR RESPONSES SUBMITTED AFTER THEIR DUE DATE WILL BE GRADED DOWN. ANY ASSIGNMENTS OR RESPONSES THAT ARE MORE THAN A WEEK LATE WILL NOT BE GRADED AND WILL RECEIVE A ZERO. IF AN ASSIGNMENT IS LATE, OTHER STUDENTS WILL NOT BE EXPECTED TO RESPOND TO IT.)**

But don’t panic - while these assignments are important, combined they only count as 10% of the final grade. Consequently, it is obvious that the team projects and the exams (discussed below) are the most important part of your grade. More importantly, however, it is felt that careful attention to these assignments and the Practice Problems (1 and 2 above) will improve your understanding of the topics and concepts being covered and will enhance your exam performance.

NOTE: I normally do not assign a “B-” or a “C+” as a final grade because neither is considered sufficient to avoid repeating the course. Instead, I look very carefully at all of the grades earned for anyone in the “B-/C+” categories and decide whether the final grade should be a “B” or a “C”. The quality of the work done on the Practice Problems, comments on these submissions, comments on the individual assignments, and the peer evaluation portion of the team projects (see below) will help make that borderline decision and may pull someone over the top.

4. MidtermExam – A midterm exam is scheduled for the week of **Mar. 1-7**. There will be a 48-hour window that will start at midnight on Wednesday and end at midnight Friday, and during any point in this 48-hour window you will have a 2-hour period in which to complete the exam. This exam will cover all of the assigned materials up to that point. This exam will count as **20% of the final grade**. The midterm will be some combination of multiple choice, matching, fill-in-the-blanks, definitions, problem working, and essays.

5. Team Projects - You will be assigned to a team (3-5 students) to work on two team projects during the semester. I will announce the teams once the roster is final. One grade will be given to each project and that team grade will be assigned to each student on the team. The team projects will count as **30% of your final grade**, with each project counting **15%**. However, the 15% assigned to each project will involve both professor and student grading. I will assign 10% of the grade based on the overall quality of the paper. At the end of the semester each member of the team will send me a confidential e-mail assigning a grade to all of the other members based on their assessment of each member’s individual contribution to each of the two projects (including your own contribution). This will count as 5% of the 15% for each project, or 10% of the final grade.

Each of these projects will require you to go beyond the textbook used this semester and use other books and articles. Please show all references and use a proper form for citing the sources for the different issues discussed in your paper.

These team projects will include:

Project A: (Due midnight February 18) -Write a 10-15 page paper on some of the Potential misuses of descriptive statistics and graphs. (This includes any of the materials covered in Chapters 1-5.) Find examples of misuse in journals, newspapers, news magazines, etc. The examples do not have to be specifically criminological.

Project B: (Due midnight April 8) - Write a 10-15 page paper on the “significance test controversy.”

6. Final Examination - The final exam will be given during exam week, (**Apr. 26-May 2**). There will be a 48-hour window that will **start at midnight on Wednesday** and **end at midnight Friday**, and during any point in this 48-hour window you will have a 2-hour period in which to complete the exam. It will encompass the entire course, but at least 75% of the questions will come from the material covered since the midterm exam unless informed otherwise. It will count as approximately **30%** of your final grade. The final exam will be some combination of multiple choice, matching, fill-in-the-blanks, definitions, problem working, and essays.

CALCULATORS AND COMPUTERS

Keep a small calculator handy because you will be working problems throughout the semester. If you don't have a calculator purchase the cheapest one you can find that has a square root button, nothing fancy! Also, outside of class you will need access to a computer that has EXCEL on it. Most computers today will have EXCEL. There are several statistical packages available that you might find interesting, but as you are learning how to compute different statistical techniques you will use your brain, a pencil and paper, a calculator, and EXCEL. If you have never worked with EXCEL the Proctor and Badzinski text listed below has a good introduction and a lot of criminological examples of its use.

ADDITIONAL SOURCES

Several additional books are listed in the syllabus and you may find it helpful to read portions of these texts if you have difficulty following a specific discussion or if you want either a simpler, more detailed, or more mathematically sophisticated presentation of the material. Some of these books are a little dated and many of them have multiple editions, but each may prove helpful if you are having problems.

Those marked with one asterisk (*) are good general references and are considered to be comparable in many respects with our textbook. They are usually older and sometimes a little more sophisticated and sometimes a little less. Those marked with a double asterisk (**) tend to be a little simpler in their presentation and sometimes are perhaps a little "cutesy". Those marked with a triple asterisk (***) are more advanced texts, frequently dealing with more narrow topics in much greater detail. These texts clearly go beyond the coverage of our textbook and may be of interest to those who plan to pursue a doctoral degree. This is not intended as an exhaustive list of references, merely a starting point. Note, however, that none of these sources are required for this course.

- *** Achen, Christopher. Interpreting and Using Regression
- * Blalock, Hubert. Social Statistics
- *** Blalock, Hubert. Measurement in the Social Sciences
- *** Chapman, Douglas and Ronald Schaufele. Elementary Probability Models and Statistical Inference.
- * Champion, Dean. Basic Statistics for Social Research
- * Couch, James V. Fundamentals of Statistics for the Behavioral Sciences
- * Dixon, Wilfrid and Frank Massey. Introduction to Statistical Analysis.
- * Downie, N.M. and R.W. Heath. Basic Statistical Methods
- *** Draper, N.R. and H. Smith. Applied Regression Analysis
- * Edwards, Allen. Statistical Analysis
- *** Ezekial, Mordecia and Karl Fox. Methods of Correlation and Regression Analysis
- * Ferguson, George. Statistical Analysis in Psychology and Education
- *** Field, Andy. Discovering Statistics Using SPSS
- ** Franzblau, Abraham N. A Primer of Statistics for NonStatisticians
- ** Freeman, Linton. Elementary Applied Statistics
- *** Freund, John E. Introduction to Probability
- *** Goodman, Leo. Analyzing Qualitative/Categorical Data
- * Hagood, Margaret and David Price. Statistics for Sociologists
- * Hammon, Kenneth and James Householder. Introduction to the Statistical Method
- * Hays, William. Statistics for Psychologists
- ** Hayslett, H. T. Statistics Made Simple
- ** Johnson, Allan G. Social Statistics Without Tears
- *** Kerlinger, Fred and Elazar Pedhazur. Multiple Regression in Behavioral Research
- *** Knoke, David and Peter Burke. Log-Linear Models

- *** Larson, Harold. Introduction to Probability Theory and Statistical Inference
- *** Lewis-Beck, Michael. Applied Regression
- * Lordahl, Daniel. Modern Statistics for Behavioral Sciences
- *** Morrison, Denton and Ramon Henkel. The Significance Test Controversy
- * Mueller, John Karl Schuessler and Herbert Costner. Statistical Reasoning in Sociology
- *** Ott, R. Lyman and Michael T. Longnecker. A First Course in Statistical Methods
- * Peatman, John. Introduction to Applied Statistics
- * Proctor, Jon L. and Diane M. Badzinski, Introductory Statistics For Criminal Justice and Criminology,
- *** Rosenberg, Morris. The Logic of Survey Analysis
- * Runyan, Richard and Audrey Haber. Fundamentals of Behavioral Statistics
- ** Salkind, Neil J. Statistics for People Who (Think They) Hate Statistics
- * Senders, Virginia. Measurement and Statistics
- * Sirkin, R. Mark. Statistics for the Social Sciences
- *** Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences
- ** Walker, Helen. Mathematics Essential for Elementary Statistics
- *** Walker, Helen and Joseph Lev. Statistical Inference
- * Weiss, Robert S. Statistics in Social Research
- ** Zeisel, Hans. Say It With Numbers
- * Zelditch, Morris. A Basic Course in Sociological Statistics

COURSE OUTLINE (Dates, Assignments, and Topics)

| <u>Dates</u> | <u>Reading Assignments</u> | <u>Lecture Topics</u> |
|---|---|---|
| Jan. 6-10 | B&P Ch. 1 | THE PURPOSE OF STATISTICS IN THE CRIMINOLOGICAL SCIENCES |
| Jan. 11-17 | B&P Ch. 2 | LEVELS OF MEASUREMENT AND AGGREGATION |
| Jan. 18-24 | B&P Ch. 3 | UNDERSTANDING DATA DISTRIBUTIONS: TABULAR AND GRAPHICAL TECHNIQUES |
| Jan. 25-31 | B&P Ch. 4 | MEASURES OF CENTRAL TENDENCY |
| Feb. 1-7 | B&P Ch. 5 | MEASURES OF DISPERSION OR VARIABILITY |
| Feb. 8-14 | B&P Ch. 6 | PROBABILITY, PROBABILITY DISTRIBUTIONS, AND AN INTRODUCTION TO HYPOTHESIS TESTING |
| Feb.15-21 | B&P Ch. 7 | POINT ESTIMATION AND CONFIDENCE INTERVALS |
| Feb 22-28 | B&P Ch. 8 | FROM ESTIMATION TO STATISTICAL TESTS: HYPOTHESIS TESTING FOR ONE POPULATION MEAN AND PROPORTION |
| Mar.1-7 | * * * MIDTERM EXAM * * * | |
| (There will be a 48 hour window beginning Wednesday midnight and ending Friday midnight.) | | |
| Mar. 8-14 | ***** SPRING BREAK ***** (no assignments) (You might want to work on team projects or individual assignments) | |
| Mar. 15-21 | B&P Ch. 9 | TESTING HYPOTHESES WITH CATEGORICAL DATA |
| Mar. 22-28 | B&P Ch.10 | HYPOTHESIS TESTS INVOLVING TWO POPULATION MEANS OR PROPORTIONS |
| Mar 29-Apr 4 | B&P Ch.11 | HYPOTHESIS TESTS INVOLVING THREE OR MORE POPULATION MEANS: ANALYSIS OF VARIANCE |
| Apr. 5-11 | B&P Ch.12 | BIVARIATE CORRELATION AND REGRESSION |
| Apr. 12-18 | B&P Ch.13 | CONTROLLING FOR A THIRD VARIABLE: MULTIPLE REGRESSION AND PARTIAL CORRELATION |

Apr. 19-25 B&P Ch.14 REGRESSION ANALYSIS WITH A DICHOTOMOUS DEPENDENT
VARIABLE: LOGIT MODELS

Apr. 26-May 1 * * * **FINAL EXAM** * * *

(There will be a 48 hour window beginning Wednesday midnight and ending Friday midnight.)

ACADEMIC HONOR POLICY:

The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to ". . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, found at <http://www.fsu.edu/~dof/honorpolicy.htm>.)

AMERICANS WITH DISABILITIES ACT:

Students with disabilities needing academic accommodation should:

- (1) register with and provide documentation to the Student Disability Resource Center; and
- (2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class.

This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the Student Disability Resource Center 97 Woodward Avenue, South, Florida State University, Tallahassee, FL 32306-4167

(850) 644-9566 (voice) (850) 644-8504 (TDD)

sdrc@admin.fsu.edu

<http://www.fsu.edu/~staffair/dean/StudentDisability/>