St. John's University
Department of Administrative and Instructional Leadership
EDU 7211 – Educational Research and Data Analysis

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Required Text: Salkind, N. J. (2005). ***Statistics for People Who (Think They) Hate Statistics.*** Thousand Oaks: Sage Publications. Please bring to class with you each session.

Also Required: Hand calculator with square root function. Memory helpful. Does not need to be a scientific calculator. Please become familiar with your calculator and bring it to class each session.

Catalog Description: This course extends the study of statistical inquiry begun in EDU 5655. It will address more advanced univariate statistical methods, principles of measurement, power analysis and effect size. Students will learn to use techniques such as multiple correlation/regression and the analysis of variance and covariance to analyze and interpret the results of experimental studies. Prerequisite: EDU 5655. Credit: 3 semester hours.

Examinations There will be two major unit examinations, a mid-term and a take home final. Exams may include multiple choice items, computational items, and short answer essay items. For the mid-term exam, you may bring one 8.5 x 11 2-sided sheet of notes to class. The final exam will be a cumulative take home exam.

Make-up Exams Make-up exams are strongly discouraged and may vary in difficulty and format. In the event of illness or crisis that prevents a student from taking the exam at the scheduled time, the student **must** contact the instructor within 24 hours of the scheduled exam to arrange for a make-up exam. The instructor is under no obligation to allow a make-up exam for any student who fails to contact the instructor within 24 hours.

Assignments

There will be one pre-class assignment and four homework assignments based on the reading and/or lecture that will help you to apply and integrate the concepts you have learned. Assignments will be discussed in class on the date due. There will also be a number of in-class assignments that will assist the student in applying the concepts learned.

Cooperation and Academic Integrity

Students are encouraged to form study groups and to consult with each other on in-class assignments and take-home work in order to enhance their own learning experiences. However, the work each student turns in is expected to reflect that student's own understanding and should be each student's own work. Students should take care that the products they turn in for a grade reflect their own work. The take home exam should reflect exclusively the student's personal understanding of the subject matter.

Grading

The exams will count 80% of your final grade with each exam contributing 40%. The assignments will constitute the remaining 20%. The exam scores will be summed and converted to a percentage correct of possible exam points. The assignment scores will similarly be converted to percentage correct of possible assignment points. A composite score with a maximum of 100 points will be computed as follows:

(.80 x Exam percentage) + (.20 x Assignment percentage).

Course grades based on the composite score will be assigned according to the following schedule:

90-100 = A; 80-89 = B; 70-79 = C; 60-69 = D; below 60 = F.

Feb. 10, 2006

Introductory Concepts

- Non-empirical verses Empirical Questions
- General Process of Research
- Descriptive verses Inferential Statistics
- Random Sampling
- Types of Variables
- Scales/Levels of Measurement

Frequency Distributions

- Characteristics of Distributions
- Histograms
- Stem and Leaf Plots
- Tally Method
- Frequency Polygons
- Ogives

Central Tendency

- Mean
- Median
- Mode

Feb. 11, 2006 Variability

- Range
- Standard Deviation
- Variance

The Normal Distribution

- Four properties common to all normal curves
- Computing & interpreting Z-scores
- Using the normal curve and Table B to determine proportions

Feb. 12, 2006 Correlation

- Covariance
- Pearson Product Moment Correlation (raw score formula and deviation score formula).
- Scatterplots & Scattergrams
- Rule of Thumb – pg. 88
- Understanding the correlation coefficient
- Coefficient of Determination – pg. 89 (Squared correlation coefficient).

Regression

- Compute the regression equation from a set of data
- Compute predicted scores from a regression equation
- Compute standard error of measurement
- Distinguish between predicting Y from X and predicting X from Y
- Interpret the squared correlation coefficient
- Draw conclusions using regression methods

Review for Midterm Exam

March 10, 2006 **EXAM – Students will have a maximum of 2.5 hours to complete the exam.**

Research Hypotheses

- The Null Hypothesis

- Directional verses Non-directional hypotheses
- The Alternative Hypothesis
- Characteristics of good estimators
- Steps involved in Hypothesis testing
- Errors involved in Hypothesis testing

March 11, 2006 Inferential Statistics

- Significance
- Decisions, Error & Power
- Case I – T-tests
- Case II – T-tests
- Analysis of Variance (ANOVA)

March 12, 2006 Inferential Statistics Continued

- Factorial Analysis of Variance
- Correlational Analysis and Prediction
- Regression
- Chi-Square
- Reliability & Validity

Review for Take Home Exam