**PSY-504 Advanced Data Analysis Cr.Hrs. 3**

**Course objectives and outcome**

1. To be familiar with the basic statistical concepts and procedures &logic of statistical reasoning.
2. To show connection between theory, methods, and statistics.
3. To know the basic techniques of descriptive and inferential statistics.
4. To clarify the statistical procedure for questionnaire and scale development.
5. To know the statistical techniques of mediation, moderation and conditional process analysis.
6. To be able to understand statistical information in published articles / research

**Course Content**

**Week 1: Overview of Descriptive Statistics**

1. Descriptive and inferential statistics
2. Scales of Measurement
3. Random sampling
4. Displaying data, graphs
5. Measures of central tendency &dispersion
6. Properties of normal distribution

**Week 2 & 3: Introduction to Hypothesis Testing**

1. Introduction using a normal sample distribution
2. Purpose and function of hypothesis testing
3. Hypothesis testing: A four step approach
4. Errors in hypothesis testing
5. Power analysis
6. Parametric and nonparametric analyses

**Week 4: Comparing Two Means**

1. One-sample t-test
2. Independent Sample t-test
3. Paired Sample t-test
4. Effect Size and Cohens’s d

**SPSS Exercise 1:** Conduct different forms of t-tests and report the results in a table in APA style. (7)

**Week 5 & 6: Analyses of Variance**

1. One-way designs
2. Factorial designs
3. Repeated measure designs
4. Post Hoc tests
5. Effect Size & Power Analysis

**SPSS Exercise 2:** Conduct different forms of ANOVA and report the results in a table in APA style. (7)

**Week 7: Bivariate Correlation**

1. Pearson product moment correlation coefficient
2. Brief introduction of Point bi-serial *r,* Phi coefficient, and Spearman’s rho
3. Scatter plots
4. Brief introduction of regression

**SPSS Exercise 3:** Run correlation analysis on assigned data using SPSS and present results in a table in the APA format (7)

**Week 8: MID TERM EXAM**

**Week 9 & 10: Regression Analysis**

1. Linear regression analysis
2. Multiple regression analysis
3. Hierarchical / Stepwise regression
4. Logistic Regression

**SPSS Exercise 4:** Conduct hierarchical/stepwise regression analysis on assigned data using SPSS and report the results in APA format. (7)

**Week 11 & 12: Regression based Advance Analysis**

1. Mediation Analysis
2. Moderation Analysis

**SPSS Exercise 5:** Conduct mediation and moderation analysis on assigned data using SPSS and report the results in APA format. (10)

**Week 13 : Factor Analysis and Reliability Analysis**

1. Theory of factor analysis and reliability analysis

**SPSS Exercise 6:** Practical demonstration of conducting factor analysis and reliability analysis on assigned data &present results in APA format. (7)

**Week 14: Nonparametric Tests**

1. The Mann-Whitney test
2. Wilcoxon’s signed rank test
3. Kruskal-Wallis ANOVA on ranks
4. Friedman’s rank test on correlated samples
5. Goodness of fit
6. Analysis of contingency tables

**Week 16: Final Exam**

**Student Evaluation:**

SPSS Exercises; 45%

Midterm Exam = 25%

Finalterm exam= 30%

**Recommended Books**

Gravetter, F., &Wallnau, L. B. (2002).*Statistics for the Behavioral Sciences,* Latest edition. Pacific Grove, CA: Brooks/Cole Publishing.

Green, Salkink, &Akey. (2000). *Using SPSS for windows: Analyzing and Understanding data* (2nd ed.). :NJ: Prentice Hall.

Howell, D. C. (2007).*Statistical methods in psychology* (6thed.). Australia: Thomson Wadsworth.

Kline, R, B. (2011). *Principles and Practice of Structural Equation Modeling* (3rded.). US: Guilford Press.