University of Jordan
Faculty of Nursing

Advanced Statistics for Nursing Research (3 credit hours)
(0701903)
2013/2014 1st. Semester

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Course Description

This course focuses on In-depth examination of descriptive statistics, correlations, regression, factor analysis, causal analysis (path models and structural equation modeling), scaling, nonlinear transformation, missing data, and interactive effects, including initial manipulation of data, integrating understanding of inference and probability.

Course Philosophy and Objectives

The philosophy in this course stresses the importance of knowledge of statistics as a foundation for reading and conducting research. Equivalent importance is placed on developing a conceptual understanding of each technique and the ability to apply each technique appropriately.

The purpose of this course is to expose students to a variety of statistical techniques for dealing with the challenges presented by a given data. The focus is on the application of appropriate statistical techniques and the interpretation of results using these techniques.

This course introduces students to multivariate statistics. Students will learn the fundamental components required for use of multivariate techniques; in addition, students will be conceptually introduced to a wide variety of advanced multivariate techniques. The course is designed to provide students with basic knowledge on both *when* and *how* to use specific techniques.

Intended Learning Outcomes (ILOs)

Successful completion of the course should lead to the following learning outcomes:
- ➢ *Knowledge and Understanding*
  - o Identify methods and process of data cleaning.
  - o Discuss major goals for conducting inferential statistics.

- - o Identify the appropriate analytical technique based on research problem.
    - o Identify sources of error in data analysis.
    - o Recognize the meeting of relevant assumptions for each selected statistical test.
    - o Critique the statistical technique in published research**.**
  - ➢ *Cognitive and Intellectual Skills*
    - o Interpret the results of t-test, ANOVA, & ANCOVA
    - o Interpret the results of linear and logistic regression
    - o Interpret the results of multivariate analysis of variance
    - o Interpret the results of principal components analysis
    - o Interpret the results of canonical correlation analysis
    - o Interpret empirical evidence from sociological research articles.

  - ➢ *Subject Specific Skills*
    - o Demonstrate knowledge of the advanced methods in health statistics.
    - o Recognize the importance of statistics nursing research.
    - o Conduct practice exercise on the major topics in the course.
  - ➢ *Transferable Skills*
    - o Apply the correct statistics procedure in data analysis.
    - o Critique research reports according to the advanced statistics methods
    - o Become independent scholar in handling data for analysis.

Required Textbooks

Warner, Rebecca. (2008). Applied statistics from bivariate through multivariate techniques. Sage publications. Los Angeles.

Recommended Readings & Resources

Tabachnik, B.G., & Fidell, L.S. (2001). Using multivariate statistics, 4th Edition. Boston: Allyn & Bacon.

Munro B., ed. (2005). *Statistical methods for health care research*. 5th. ed. Philadelphia: Lippincott.

IBM Corporation (2012). *IBM SPSS Statistics for Windows*, Version 21.0. Armonk,

NY: IBM Corp.

American Psychological Association. (2009). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.

Evaluation: **Points**

Assignment 1   10
Assignment 2   10
Assignment 3   10
Midterm exam   30
Final Exam   40

Course policies:

- There will be assignments related to each statistical technique presented in the course. Each student need to get data for his/her assignment practices. My intention is that these assignments will assist in the completion of the advanced quantitative methods area exam in nursing and/or will facilitate your own independent research projects.
- Each student is expected to submit assignment on the due date. One grade will be deducted for each day after due date.
- We will also discuss and critically evaluate published research based on the various statistical techniques. Make sure that you carefully read the assigned examples of published research before class and be prepared to discuss them.
- The course is based on an interactive relationship between the instructor and students, as well as on collaboration among the students. You are strongly encouraged to ask questions and discuss the material in class. I also encourage collaboration among the students. Please feel free to help each other when running analyses for assignments.
- I also would like to stress that you are always welcome to come and see me with any additional questions. If I am not in my office, email is the best way to get in touch. Also, please check the course website regularly: typically, each week I will post course notes for you.

Topics:

Weeks	Topics
	Introduction to the course:
	Descriptive statistics, Data screening, missing data, outliers
	t-test
	ANOVA, ANCOVA
	Correlations
	Regression (simple, multiple, logistic)
	Factor analysis (EFA)
	Path analysis, structure equation modeling, & (CFA)

(Assumptions, Nonelinear transformation, interaction effect, mediating and moderating effects) will be presented with each relevant statistical test