



CLRES 2024 – Nonparametric Statistics Spring 2009

Instructors

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Credits

1 credit (16 contact hours = 2 sessions each week for 4 weeks beginning Monday, March 2nd through and including Wednesday, March 25th. Each session is 2 hours.)

Prerequisite

CLRES 2020 (Biostatistics) or equivalent courses

Course Objectives

CLRES 2024 (Nonparametric Statistics) is designed for medical researchers with non-biostatistics majors. The course will focus on the basic concepts of categorical data analysis. The course objectives are to:

- Recognize when it is necessary to use nonparametric statistics.
- Identify different statistics used in nonparametric statistics, and be able to estimate and interpret these statistics.
- Recognize when it is necessary to use statistics that account for repeated measures.
- Become familiar with issues in the design, analysis, and interpretation of studies involving nonparametric statistics.
- Develop analytic skills through the analysis of data sets taken from the fields of medicine and public health.
- Develop oral and written communication skills through the description of analytic strategies and the summarization and interpretation of results.

Grading

A letter grade is given and based on course requirements.

Meeting Times

Lectures: MW 1:00-3:00pm (222 VALE), March 2 – March 25, 2009.

Textbook

Daniel W., (1990). *Applied Nonparametric Statistics*. Pacific Grove, CA: Duxbury.

References

Hollander, M. & Wolfe, DA. (1973). *Nonparametric Statistical Methods*. NY: John Wiley & Sons.

Pett, MA (1997). *Nonparametric Statistics for Health Care Research*. Thousand Oaks, CA: SAGE.

Software

STATA 10, www.stata.com

Course Outline

	Date	Topic	Assignment
Doris Rubio	Monday, March 2 nd (Lecture 1)	Introduction	Reading: Chapters 1 & 2
Doris Rubio	Wednesday, March 4 th (Lecture 2)	Using Data from Two Independent Samples <i>Concepts and Topics:</i> Non-parametric techniques for comparing the distributions of data from two or more samples will be discussed.	Reading: Chapter 3
Kaleab Abebe	Monday, March 9 th (Lecture3)	Using Data from Three or More Independent Samples <i>Concepts and Topics:</i> Tests appropriate for independent samples will be introduced including a review of the uses of the Chi-Square test.	Reading: Chapters 5 & 6
Mark Roberts	Wednesday, March 11 th (Lecture 4)	Nonparametric Correlation <i>Concepts and Topics:</i> Nonparametric correlation using the Spearman correlation coefficient and Kendall's tau will be discussed. An introduction of the bootstrap as a method of obtaining confidence intervals for these coefficients will be given. Extension of Kendall's tau to a more general measure of concordance useful in longitudinal data will also be	Reading: Chapter 9

		covered.	
Doris Rubio	Monday, March 16 th (Lecture 5)	<p align="center">Using Data from Two Related Samples</p> <p><i>Concepts and Topics:</i> The class will discuss nonparametric tests that assess the difference between two measurements within pairs. The tests will determine if the measurements within pairs are significantly different enabling us to conclude if the treatment is effective for example. Three nonparametric tests are covered: Sign test for two related samples; Wilcoxon Matched-Pairs Signed-Ranks test and the McNemar test.</p>	Reading: Chapter 4
Doris Rubio	Wednesday, March 18 th (Lecture 6)	<p align="center">Using Data from Three or More Related Samples</p> <p><i>Concepts and Topics:</i> The class will discuss nonparametric tests that assess the difference between multiple measurements. The tests will determine if the measurements are significantly different enabling us to conclude if the treatment is effective for example. Nonparametric tests to be covered: Friedman Two-Way Analysis; Page's Test for Ordered Alternatives; Durbin Test for Related Observations; Cochran's Test for Related Observations.</p>	Reading: Chapter 7
Mark Roberts	Monday, March 23 rd (Lecture 7)	<p align="center">Goodness of Fit</p> <p><i>Concepts and Topics:</i> Statistical tests often depend on the requirement that data has a particular distribution. "Goodness of fit" statistics that assess whether observed data is likely to have been obtained from a sample with a specified distribution are presented.</p>	Reading: Chapter 8
Doris Rubio	Wednesday, March 25 th (Lecture 8)	<p align="center">Decision Tree</p> <p>This class will focus on learning how to identify what statistic is appropriate given the data. A decision tree will be presented.</p>	

Revised 02/12/09-DM