



King Saud University

College of Business Administration

Quantitative Analysis Department

# Statistical Methods in Health Administration QUA 520

Instructor:

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Ph.D. in BioStatistics

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## Course Description

This course introduces biostatistical methods and applications, covering descriptive statistics, probability, and inferential techniques necessary for appropriate analysis and interpretation of data relevant to health sciences. Students will use the statistical software package (SPSS).

## Course Objectives

- Familiarity with basic biostatistics terms.
- Ability to summarize data and do basic statistical analyses using SPSS.
- Ability to understand basic statistical analyses in published journals.
- Understanding of key concepts including statistical hypothesis testing – critical quantitative thinking.
- Foundation for more advanced analyses.

## Course Evaluation

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|-------------------------------|-------|
| 1. Assignments and attendance | (20%) |
| 2. Midterm exams              | (20%) |
| 3. Project                    | (20%) |
| 4. Final exam                 | (40%) |

## Text book

**Rosner B. Fundamentals of Biostatistics, 7th ed.  
Brooks/Cole, Boston, MA, 2011.**

## Course Contents and Plan

TOPIC	DATE	READING
Descriptive statistics <ul style="list-style-type: none"> <li>— Populations and samples</li> <li>— Types of data</li> <li>— Graphic methods</li> <li>— Measures of location</li> <li>— Measures of spread</li> </ul>	21/09/2016 28/09/2016	Ch 1 & 2
Introduction to the SPSS Interface <ul style="list-style-type: none"> <li>— Opening an existing SPSS database</li> <li>— Graphical data analysis</li> <li>— Descriptive statistics</li> </ul>	05/10/2016	
Probability and Probability distributions <ul style="list-style-type: none"> <li>— Elementary probability</li> <li>— Elementary properties of random variables</li> <li>— Binomial distribution</li> <li>— Poisson distribution</li> <li>— Normal distribution</li> <li>— Central limit theorem</li> <li>— Normal approximation to the binomial</li> <li>— Normal approximation to the Poisson</li> </ul>	12/10/2016 19/10/2016 26/10/2016	Ch 3,4,5
One-sample inference <ul style="list-style-type: none"> <li>— Populations and samples</li> <li>— Point estimation</li> <li>— The logic of hypothesis testing</li> <li>— Inference for the mean of the normal distribution</li> <li>— Inference for the binomial distribution</li> <li>— Inference for the Poisson distribution</li> <li>— Confidence intervals for the mean and variance</li> <li>— Hypothesis testing and confidence intervals</li> <li>— Confidence intervals for binomial and Poisson</li> </ul>	02/11/2016 09/11/2016 23/11/2016	Ch 6 & 7
Midterm exam	30/11/2016	
Two-sample inference <ul style="list-style-type: none"> <li>— Inference for paired samples</li> <li>— Inference for independent samples (equal variance)</li> <li>— Underlying assumptions</li> <li>— Inference for independent samples (unequal variance)</li> <li>— Two-sample tests for binomial proportions</li> <li>— Measures of effect for binomial data</li> </ul>	07/12/2016 14/12/2016	Ch 6 & 8

Simple linear regression and correlation — Fitting regression lines - method of least squares — Inference and prediction for regression — Correlation	21/12/2016 28/12/2016	Ch 11
Analysis of Variance, ANOVA — One-way ANOVA — Hypothesis testing — Comparisons of Groups	04/01/2016	Ch 12
Nonparametric Methods — Sign Test — Wilcoxon Signed Rank Test — Wilcoxon Rank Sum or Mann Whitney Test — Kruskal Wallis Test — chi-square test for goodness of fit — Chi-square test for independence.	11/01/2017	Ch 9 & 10
<b>Final Exam</b>	<b>18/01/2017</b>	