College of Business Administration

Quantitative Analysis Department

Statistical Methods in Health Administration

QUA 520

Course Facilitator:

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Course Description

This course introduces bio-statistical 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 one of the statistical software package such as SPSS

Course Objectives

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

Course Evaluation

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

Text Book

Triola, Marc M.; Triola, Mario F., and Roy, Jason (2019) BIOSTATISTICS for the Biological and Health Sciences, Pearson.

Daniel, W. W., & Cross, C. L. (2018). Biostatistics: a foundation for analysis in the health sciences. Wiley.

Course Contents and Plan

TOPIC	DATE	READING
Introduction to Statistics: Descriptive statistics — Populations and samples — Types of data — Graphic methods — Measures of location — Measures of spread	7/09/2020	Ch 1 & 2 & 3
Introduction to the SPSS Interface — Opening an existing SPSS database — Graphical data analysis — Descriptive statistics	14/09/2020	
Probability and Probability distributions: — Elementary probability — Elementary properties of random variables — Binomial distribution — Poisson distribution — Normal distribution — Central limit theorem — Normal approximation to the binomial — Normal approximation to the Poisson	21/09/2020 28/09/2020 05/10/2020	Ch 4,5,6
One-sample inference — Populations and samples — Point estimation — The logic of hypothesis testing — Inference for the mean of the normal distribution — Inference for the binomial distribution — Inference for the Poisson distribution — Confidence intervals for the mean and variance — Hypothesis testing and confidence intervals — Confidence intervals for binomial and Poisson	12/10/2020 19/10/2020 26/10/2020	Ch 7,8,9
Midterm exam	02/11/2020	
Two-sample inference — Inference for paired samples — Inference for independent samples (equal variance) — Underlying assumptions	09/11/2020 16/11/2020	Ch 6 & 8

— Inference for independent samples (unequal variance) — Two-sample tests for binomial proportions — Measures of effect for binomial data		
Simple linear regression and correlation — Fitting regression lines - method of least squares — Inference and prediction for regression — Correlation	23/11/2020	Ch 10,11
Analysis of Variance, ANOVA — One-way ANOVA — Hypothesis testing — Comparisons of Groups	30/11/2020	Ch 12
Nonparametric Methods — Sign Test — Wilcoxon Signed Rank Test — Wilcoxon Rank Sum or Mann Whitney Test — Kruskall Wallis Test — chi-square test for goodness of fit — Chi-square test for independence.	7/12/2020	Ch 13
Final Exam	**13/12/2020**	

Some remarks about the Research Paper

- Maximum three students can work together in condition that each one has a certain role.
- Four reports must be submitted:
  - First, title and objectives of the paper in (Week 2).
  - Second, paper literature review, objectives, methodology and questionnaire design in (Week 5).
  - Third, initial analysis of the data in (Week 11)
  - Four, final paper with also short presentation in (week 13).
- It is expected that all papers are done in professional way that represent well educated master's degree students.
- The paper should be typed in Double space Simplified Arabic (font 14).
- All analysis have to be done in SPSS.
- There should be a cover page with:
  - ✓ Title of the program
  - ✓ Course title and no.
  - ✓ Names of the students and their university ID no.
  - ✓ Date of submission