

COURSE PLAN

FIRST: BASIC INFORMATION

College

College : **Medicine**Department : **Basic Medical Sciences**

Course

Course Title : **Epidemiology and Biostatistics**Course Code : **(31505204)**Credit Hours : **3**Prerequisite : **None**

Instructor

Name : **Dr Hatim Jaber**Office No. : **1**Tel (Ext) : **3574**E-mail : **hjaber@bau.edu.jo**

Office Hours :

Class Times	Building	Day	Start Time	End Time	Room No.
	Lecture Hall Complex				

Text Books

Learning Resources: Power point presentations.**Recommended Books & Articles.**

- 1- Winner, L(2004). Introduction to Biostatistics. Florida: Department of Statistics; University of Florida.
- 2- Daniel, W. (2005). Biostatistics: A foundation for analysis in the health sciences. New Jersey: New Jersey: John Wiley & Sons Inc.
- 3- Textbook: Epidemiology for Public Health Practice, Robert H. Friis and Thomas A. Sellers. Fifth edition, 2013, Jones and Bartlett.

SECOND: PROFESSIONAL INFORMATION

COURSE DESCRIPTION

This course provides students with core skills in epidemiology and biostatistics. This course covers analytical and descriptive epidemiology, the epidemiology of infectious and chronic diseases; transmission of infectious diseases, descriptive statistics, the theory of probabilities, levels of significance, hypothesis testing, regression and correlation and the use of statistics in epidemiology.

COURSE OBJECTIVES

Overall Course Objective:

To teach students of how to apply their core skills in epidemiology and biostatistics in the field.

Course Goals:

1. Discuss how to collect data from the field: questionnaire as a tool of data collection.
2. Discuss the importance and relations between health research , epidemiology and biostatistics.
3. Describe the different types of samples and when to use it.
4. Discuss the practical importance of key concepts of probability, inference, systematic error, sampling error, measurement error, hypothesis testing, type I and type II errors and confidence bounds.
5. Understand what statistical technique will provide the best answer to a given research question
6. Develop necessary computer skills using the SPSS in order to conduct basic statistical analyses
7. Discuss SPSS package to perform two sample comparisons of means and create confidence intervals for the population mean differences
8. Understand how to Translate research objectives into clear, testable statistical hypotheses. Interpret and explain a p-value
9. Differentiate between parametric and nonparametric tests and comprehend their underlying assumptions
10. Understand definition , history and uses of Epidemiology
11. Differentiate between different types of study types
12. Identify an association, types, and implication.
13. Demonstrate understanding of causal relationships, and factors of disease causation.
14. Assess cause and effect relationship using Hill's criteria.
15. Identify bias and confounding in epidemiological study designs, their types and ways to control them in various types of biases.
16. Understand Concepts in the infectious diseases
17. Understand Concepts in non-communicable diseases
18. Evaluate screening tests and interpreting their uses in different populations.
19. Assess radiation as a workplace hazard, its types, sources, and control measures.
20. Appreciate and evaluate Noise Induced Hearing Loss (NIHL) as an occupational disease
21. Appreciate and evaluate the current global environmental problems, their causes, effects, and prevention measures
22. Identify types of food borne diseases and prevention measures. Identify different types of prevention
23. Explain types of food contamination, their sources, and methods of food sterilization.
24. Discuss types of food additives, reasons for their use, and side effects.

LEARNING OUTCOMES

After completion of the course, the student should be able to:

1. Explain how to collect data from the field: questionnaire as a tool of data collection.
2. Describe the importance and relations between health research , epidemiology and biostatistics.
3. Describe the different types of samples and when to use it.
4. Apply numerical, tabular, and graphical descriptive techniques characterize and summarize public health data
5. Decide what statistical technique will provide the best answer to a given research question
6. Calculate and interpret confidence intervals for population means and proportions.
7. Translate research objectives into clear, testable statistical hypotheses. Interpret and explain a p-value
8. Differentiate between parametric and nonparametric tests and comprehend their underlying assumptions
9. Identify appropriate statistical methods to be applied in a given research setting, apply these methods, and acknowledge their limitations.
10. Use SPSS package to perform two sample comparisons of means and create confidence intervals for the population mean differences
11. Use SPSS package to perform two sample comparisons of means and create confidence intervals for the population mean differences
12. Use SPSS package to compare proportions amongst two independent populations
13. Describe definition , history and uses of Epidemiology. Differentiate between different types of study types
14. Identify an association, types, and implication.
15. Demonstrate understanding of causal relationships, and factors of disease causation.
16. Assess cause and effect relationship using Hill's criteria.
17. Identify bias and confounding in epidemiological study designs, their types and ways to control them in various types of biases.
18. Describe Concepts in the infectious diseases
19. Identify types of food borne diseases and prevention measures
20. Identify different types of prevention
21. Describe Concepts in non-communicable diseases
22. Evaluate screening tests and interpreting their uses in different populations.
23. Assess radiation as a workplace hazard, its types, sources, and control measures.
24. Appreciate and evaluate Noise Induced Hearing Loss (NIHL) as an occupational disease
25. Appreciate and evaluate the current global environmental problems, their causes, effects, and prevention measures.
26. Explain types of food contamination, their sources, and methods of food sterilization.
27. Identify types of food additives, reasons for their use, and side effects.

Professional Skills

The student should be able to differentiate the different basic aspects of Epidemiology and Biostatistics.

Competences (Transferable skill and attributes)

The student should be able to differentiate the different basic approaches required for each aspects of Community Medicine regarding Epidemiology and Biostatistics.

Approach to practical and field work:

Students will be divided into two main groups. The first group will be allocated to collect data (using self prepared questioner) about chronic diseases from workers of Al-Balqa Applied University-Main Centre, the second group from adults neighbors in the community. After data collection from the field, each group will coding , entering and analyze a specific part of the collected data and write their report. The report includes: title, summary, introduction and objectives, review of literature, methodology, results, discussion and conclusions, recommendations, and references.

Course Contents

Week	Course Topic	Notes
Week 1	Course Introduction and Overview Field work allocation Definition of Biostatistics Purposes of Biostatistics Population and Sample Types	Overview of course syllabus and time table. Introduction to course and field work : questionnaire as a tool of data collection. Understand how to collect data from the field. Understand how to write the report . Discuss and understand the importance and relations between health research , epidemiology and biostatistics. Describe the role of the biostatisticians in biomedical research. Understand the basic statistical concepts and their application to healthcare research Describe the different types of samples and when to use it. Discuss different types of data, data sources and data quality for the purpose of selecting appropriate data for specific research questions.
Week 2	Descriptive statistics: measures of variability.	Describe the different types of statistics: measures of variability. Apply numerical, tabular, and graphical descriptive

	<p>Graphical display: looking at data</p> <p>Practical Overview of SPSS 1</p>	<p>techniques characterize and summarize public health data</p> <p>Evaluate computer output containing statistical procedures and graphics and interpret in a public health context.</p> <p>Develop and understand the necessary computer skills using the SPSS in order to conduct basic statistical analyses</p> <p>Coding and entering data in SPSS</p> <p>Evaluate computer output containing statistical procedures and graphics and interpret in a public health context</p>
Week 3	<p>Fundamentals of Probability & Sampling Distributions</p> <p>Shapes of Distributions: Modality, Symmetry, Skewness, & Kurtosis</p> <p>The Normal Distribution: Area Under the Normal Curve</p> <p>Introduction to Statistical Inference</p> <p>Inferences for Proportions</p> <p>Comparing Proportions: Relative Risk and Odds ratio</p> <p>Practical Overview of SPSS 2</p>	<p>Describe the different types of statistics. Two Variables (Bivariate Description): Cross tabulation & Risk Indexes</p> <p>Discuss the practical importance of key concepts of probability, inference, systematical error, sampling error, measurement error, hypothesis testing, type I and type II errors and confidence bounds. Calculate standard normal scores and resulting probabilities.</p> <p>Comprehend the conceptual basis of statistical inferences.</p> <p>Decide what statistical technique will provide the best answer to a given research question</p> <p>Calculate and interpret confidence intervals for population means and proportions.</p> <p>Use SPSS package to perform two sample comparisons of means and create confidence intervals for the population mean differences</p> <p>Use SPSS package to compare proportions amongst two independent populations</p> <p>Use SPSS package to interpret output from the statistical software package related to the various estimation and hypothesis testing procedures covered in the course.</p>
Week 4	<p>Estimation of Parameters Statistics inference Hypothesis testing</p>	<p>Differentiate between quantitative problems that can be addressed with standard, commonly used statistical methods and</p>

	<p>Significance testing</p> <p>Parametric vs. non-parametric technique. One-sample t-test, two-sample t-test . Analysis of variance (ANOVA) Pearson's product moment correlation, and regression.</p> <p>Categorical data analysis: Nominal data: Chi-square Goodness-of-fit test. Non-parametric statistical tests: Ordinal data: Mann Whitney U test , Kruskal Wallis test , Spearman's Rank Order Test</p> <p>Practice and Overview of SPSS 3</p>	<p>those requiring input from a professional biostatistician</p> <p>Translate research objectives into clear, testable statistical hypotheses. Interpret and explain a p-value</p> <p>Differentiate between parametric and nonparametric tests and comprehend their underlying assumptions</p> <p>Identify appropriate statistical methods to be applied in a given research setting, apply these methods, and acknowledge their limitations.</p> <p>Critically analyze and critique selected quantitative research reports and make judgment on the accuracy of the statistical techniques employed on those reports.</p> <p>Use SPSS package to perform two sample comparisons of means and create confidence intervals for the population mean differences</p> <p>Use SPSS package to compare proportions amongst two independent populations</p> <p>Use SPSS package to interpret output from the statistical software package related to the various estimation and hypothesis testing procedures covered in the course</p>
Week 5		<p>Revision and report submitting 10%</p> <p>Pre-midterm Revision</p> <p>Midterm Exam 40 % of Total Grades</p>
Week 6	<p>Basic epidemiological concepts/</p> <p>Epidemiological study types</p> <p>Association and causation</p> <p>Bias and confounding</p>	<p>Understand definition , history and uses of Epidemiology</p> <p>Differentiate between different types of study types</p> <p>Identify an association, types, and implication.</p> <p>Demonstrate understanding of causal relationships, and factors of disease causation.</p> <p>Explain theories of disease causation, and types of causal relationships.</p> <p>Assess cause and effect relationship using Hill's criteria.</p> <p>Calculate and interpret measures of association, and application of the appropriate measure in various study designs</p>

		Identify bias and confounding in epidemiological study designs, their types and ways to control them in various types of biases.
Week 7	<p>Communicable diseases Epidemiology</p> <p>Transmission of infectious diseases</p> <p>Chronic NC Diseases Epidemiology</p> <p>Screening tests and result interpretation</p>	<p>Understand Concepts in the infectious diseases</p> <p>Identify types of food borne diseases and prevention measures</p> <p>Identify different types of prevention</p> <p>Understand Concepts in non-communicable diseases</p> <p>Identify types of NCD diseases and prevention measures</p> <p>Evaluate screening tests and interpreting their uses in different populations.</p>
Week 8	<p>Workplace Hazards –Radiation and Noise at workplace</p> <p>Current global environmental problems, their causes, effects, and prevention measures.</p> <p>Current global environmental problems, their causes, effects, and prevention measures.</p>	<p>Assess radiation as a workplace hazard, its types, sources, and control measures.</p> <p>Appreciate and evaluate Noise Induced Hearing Loss (NIHL) as an occupational disease</p> <p>Appreciate and evaluate the current global environmental problems, their causes, effects, and prevention measures.</p> <p>Appreciate and evaluate the current global environmental problems, their causes, effects, and prevention measures.</p>
Week 9	<p>Food contamination and food borne diseases</p> <p><i>Revision</i></p>	<p>Explain types of food contamination, their sources, and methods of food sterilization.</p> <p>Identify types of food additives, reasons for their use, and side effects.</p> <p>Group Discussion</p>
Week 10	FINAL EXAM	50 % of Total



COURSE LEARNING RESOURCES

Lectures
Data show
Handouts including highlights

ONLINE RESOURCES

The Epidemiology and Biostatistics web pages

ASSESSMENT TOOLS

(Write assessment tools that will be used to test students ability to understand the course material and gain the skills and competencies stated in learning outcomes)

ASSESSMENT TOOLS	%
Mid Exam	40
Field work and report	10
Final Exam	50
TOTAL MARKS	100

THIRD: COURSE RULES

ATTENDANCE RULES

Attendance and participation are extremely important, in this aspect the university rules will be applied. Attendance will be recorded by the instructor for each class. Maximum allowed absence is 15% of the course. The result of absentees is that the student will not be permitted to attend the final examination and he/she will be granted zero mark in that exam.

GRADING SYSTEM Example:

REMARKS

COURSE COORDINATOR

Course Coordinator: Dr. Hatim Jaber

Department Head:

Signature:

Signature:

Date: Date: